



Native Wetlands of
the Central Bluegrass Region:
from seeps and streamheads to swamps and ponds



Cover: mowed streamhead with green ash near Lexington (JC).
Above left: green ash by Craig Rowe (www.earlyforest.com/2009/08/).

Above right: green ash dying due to Emerald Ash Borer, by Jim McCormac (jimmacormac.blogspot.com).

[Most green ashes and white ashes in Kentucky will probably die during the next 10-30 years due to Emerald Ash Borer—an alien bark beetle from East Asia. Selected trees can be kept alive using insecti-

cides, but financial and logistical limitations will limit treatment to only a minute proportion of all trees. Green ash is dominant in most remaining swampy woods of the central Bluegrass, and their death will cause significant shifts in composition. The most ecologically appropriate substitute for green ash is swamp white oak (see p. 3), but there has been little propagation of that species in local nurseries. Although the USDA is collecting seed of ashes for future uses, including breeding of resistance, there is currently no organized program in Kentucky to collaborate with that effort.]

Native Wetlands of the Central Bluegrass Region.

Notes by Julian Campbell, Feb 2012: <http://bluegrasswoodland.com>.

Summary (for more technical details see subsequent pages).

Wetlands are broadly defined here to include swampy ash-oak woods, poorly drained meadows and ponds. These notes are focused on the calcareous Central Bluegrass region, including transitions to more shaley soils of adjacent Eden Shale Hills. Wet woods occur mostly on poorly drained alluvial (fluvaquentic) soils, sometimes with back-water flooding. Swales and depressions tend to have more ponding, more open vegetation, and more organic (mollic) soils. Distinct, atypical variants of these habitats occur on old wet terraces of the Kentucky River, with less fertile, more acid (but still alfic) soils on fragipans. Some of these habitats are not detailed in the Natural Heritage Program, and may be considered globally imperiled.

Typical trees are green ash and, locally, swamp white oak. Trees of more acid soils are largely restricted to old river terraces, including sweet-gum and pin oak. In ponds, black willow or button-bush are locally dominant, together with varied duckweeds and water-plantains. Typical herbs include swamp milk-weed, water-hemp, swamp bittercress and winged monkey-flower. Typical graminoids include several sedges, bull-rushes, reed-grass, fowl manna-grass, rice cut-grass and cat-tail. Because of habitat destruction, many typical species are uncommon, rare or locally extinct. None of these plants or animals are globally imperiled, but several northern species have declined greatly within the central Ohio Valley.

Due to drainage and agricultural conversion, only a few dozen identifiable remnants of the original wetland vegetation in this region exist, mostly just 1-10 acres in size. Despite this poor condition, there is increasing general interest by the general public and by government agencies in restoration of wetlands. If a more concerted effort begins to focus on the special problems of Bluegrass wetlands, we will first need a more detailed survey of the remnants and collection of propagules for local nurseries. It would be good to form a collaborative framework for overall conservation in the region.

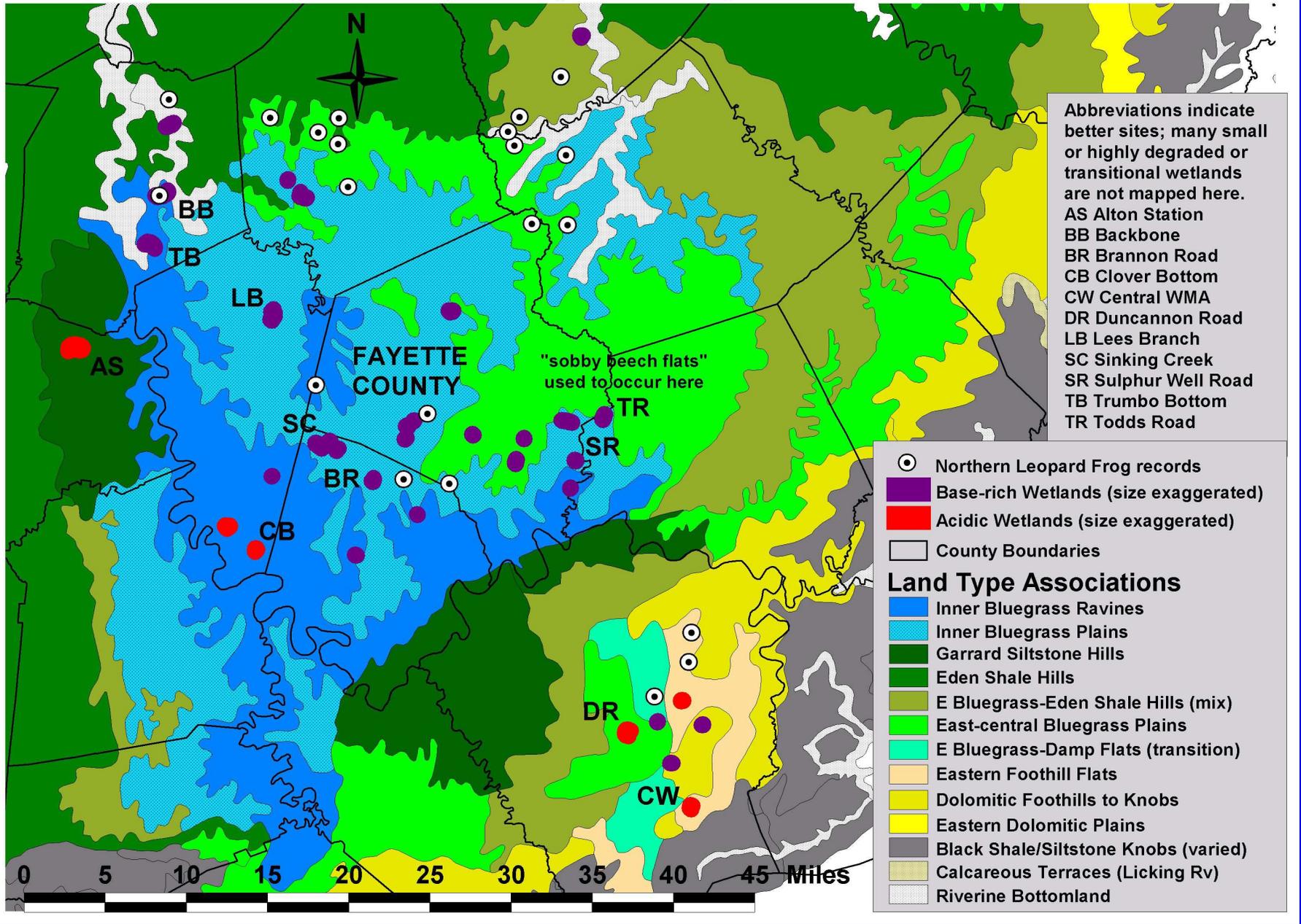


Swamp white oak: lower leaf surfaces have dense white hairs.



Acorns of swamp white oak form on distinctively long stalks.

Wetlands of the Central Bluegrass Region (north-central Kentucky)



Geology and soils. The Central Bluegrass region is loosely defined here to include the Inner Bluegrass, underlain by Middle Ordovician bedrock, plus adjacent transitions to shaly bedrock of the “Eden Shale Hills.” That Upper Ordovician shale interdigitates in several areas with phosphatic limestones of the Inner Bluegrass. The ‘core’ woodland habitat outlined here occurs mostly on poorly drained fluvaquentic eutrochrepts and fluvaquents (Lindsay, Newark, Melvin). In swales and depressions with more ponding, there are hapludolls and haplaquolls (Egam, Lanton, Dunning); transitional uplands on gentle toeslopes and high terraces may also have argiudolls (Donerail). The Kentucky River has left a complex series of terraces. On older acid terraces (with pH = 5-6 versus 6-7.5 in general), there are fragiudalfs and fragiaqualfs (Otwell, Lawrence, Robertsville). The distinct vegetation on those terraces is noted below, but is not part of the central focus.

Characteristic species. Typical trees are green ash (*Fraxinus pennsylvanica*) and, locally, swamp white oak (*Quercus bicolor*), but the oak is now rare. Trees of more acid soils are largely restricted to on old terraces of the Kentucky River, including sweet-gum (*Liquidambar*) and pin oak (*Q. palustris*), plus beech (*Fagus*) on drier ground. In places with natural ponding, black willow (*Salix nigra*) or button-bush (*Cephalanthus*) are dominant at some sites, together with varied duckweeds (Lemnaceae) and water-plantains (Alismataceae). Herbs include swamp milk-weed (*Asclepias incarnata*), water-hemp (*Boehmeria*), swamp bittercress (*Cardamine bulbosa*) and winged monkey-flower (*Mimulus alatus*). Including transitions to adjacent damp meadows, characteristic graminoids include several sedges (*Carex conjuncta*, *lupulina*, *shortiana*, etc.), bull-rushes (*Schoenoplectus tabernaemontani*, *Scirpus atrovirens*, etc.), reed-grass (*Cinna arundinacea*), fowl manna-grass (*Glyceria striata*), rice cut-grass (*Leersia oryzoides*) and cat-tail (*Typha latifolia*).

Rare species (plants, animals). Because of habitat destruction, about ¼ of the 110 typical species are uncommon to rare in this region. Plants that have largely disappeared include several (mostly northern species) that are typical of fens and wet meadows, and may have



Marsh marigold (*Caltha*): found by C.W. Short ca. 1840 at “Beard’s Branch near Lexington” and by C.E. Mueller in 1883 near Louisville.



Anemone canadensis: found by C.W. Short ca. 1840 “on Elkhorn near Lex[ington]” and reported by Nelson in 1919 from Boone Co.



Small artificially enhanced wetland below Moberly Spring in Lexington: rice cut-grass and snapping turtles have settled in to their new home.

originally occurred in transitions to thin woods on drier ground that was influenced by larger herbivores: *Anemone canadensis*, *Caltha palustris*, *Carex vesicaria*, ?*Cassia hebecarpa*, ?*Fraxinus nigra* [not verified], *Lysimachia hybrida*, *Mentha canadensis*, *Stenanthium gramineum*, ?*Thalictrum dasycarpum*. At one browsed site, there is also a remarkable disjunct population of the southern orchid, *Spiranthes odorata*. Varied rare animals deserve further assessment, including beaver (see p. 12), northern leopard frog (especially in upland transitions), Bluegrass crawfish (endemic to more acid fragipans in transition to se. Knobs), and spotted salamander (ponds on old acid terraces). Few plants or animals are globally imperiled, but several have declined greatly within the central Ohio Valley.

Cross-walk with other classifications. In the Ky. Natural Heritage system, there is no direct match. The vegetation outlined here overlaps in part with their wet bottomland hardwood forest, bottomland hardwood swamp, bottomland marsh, shrub swamp and wet meadow. In the NatureServe system (their CEGL numbers), the green ash-swamp white oak type is recognized just for the Bluegrass (4422). Drier transitions match their midwestern types with more bur oak, shellbark hickory or hackberry (2098, 2140). More acid variants match their widespread types of east-central states with pin oak and sweetgum (2432) or red maple (6548). Black willow (7703) and buttonbush ponds (2191) match their widespread south-central types. More open marshy vegetation with bull-rush (2026) or cat-tail (2026) is closest to their widespread midwestern or southeastern types, respectively (see also 5106). [For internal reference, included here are JC classes 09, 06 and 02, with edaphic variants D and E in all three.]

Issues for conservation. With drainage and agriculture, only 10-20 significant sites remain in the region, mostly covering just 1-10 acres. The original vegetation has often been intensively grazed or mowed, leaving open woods of green ash with pasture grasses on the ground. While not forming intact ‘remnants’ such woods might be restored eventually to a more natural condition. Remnants are locally invaded by alien plants, including purple loosestrife at a few sites. Several native species have largely disappeared from the region.



Spiranthes odorata: the only verified plants in Kentucky are along Lees Branch in Woodford Co. It is the only species of ladies’ tresses to spread by stolons, and it is readily cultivated in gardens.



Lysimachia hybrida: this showy northern ‘loosestrife’ has almost disappeared in Ky. W. Meijer collected it in Jessamine Co. during 1974.



Snapping turtles are typical of eutrophic wetlands in this region. They can travel a mile or more overland to reach new habitat or to lay eggs.



Northern leopard frogs are rare in Kentucky, where they occur locally in the Bluegrass region, spreading from small ponds into damp fields.



Female snappers typically deposit 25-80 eggs each year. Incubation time is temperature-dependent, lasting 9 to 18 weeks.



Spotted salamanders are widespread in eastern North America, but restricted to damp woods with acid soils, and rare in the Bluegrass.

Despite this poor condition, there is increasing general interest by the public in restoration of wetlands. Moreover, some government agencies are able to provide significant funds for ecological enhancement of watersheds in the region. If a more concerted effort begins to focus on the special problems of Bluegrass wetlands, we will first need a more detailed survey of the remnants and collection of propagules for local nurseries. It would be good to form a collaborative framework for overall conservation in the region. Interested parties might include the Kentucky Nature Preserves Commission, University of Kentucky Arboretum, Lexington-Fayette UCG and other county governments, Friends of Wolf Run and other non-profit organizations. Owners of more significant remnants should be contacted carefully to determine if private or public resources can be applied to their tracts. A new effort should be initiated to propagate wetland species from local provenances.

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Featherbells (*Stenanthium*): found ca. 1840 by C.W. Short in “meadows about Lexington... rare.” This largely Appalachian and Ozarkian plant of damp medium-acid soils has declined much across its range, and it has virtually disappeared from the central Ohio Valley.



Duncannon Swamp, 5 miles south of Richmond, with more pin oak and other acidophiles compared to the Lexington area. Several old “licks” occurred in this part of Madison Co. before settlement, where unusually damp soils prevail. Initial coring indicates sediment 1000s of years old.

TYPICAL NATIVE SPECIES

Excluding those concentrated in more mesic or riparian habitats, which can include transitions.

Underlined: commonest species, at least in good remnants.

s.l. = sensu lato, implying that more than one segregate occurs.

[]: broader genus concept.

* Uncommon to locally rare.

** Regionally-rare/state-listed.

*** Regionally disappeared.

Note codes after (/) names:

P or p = Species that are strongly or weakly concentrated in openings around ponds.

C/c = all/most on more acid soils, especially old terraces.

M/m = all/most submesic trans.

S/s = all/most subhydric trans.

R/r = all/most riparian trans.

Typical larger trees

**Acer rubrum* var. *trilobum*/C

Carya laciniosa/m

**Celtis laevigata*/h

****Fraxinus nigra* ?

[historical status unclear]

Fraxinus pennsylvanica s.l.

(*Liquidambar styraciflua*/Ch)

Platanus occidentalis/r

**Quercus bicolor*

***Quercus lyrata*

Quercus imbricaria/m

(*Quercus palustris*/C)

Quercus shumardii/m

Salix nigra/P

Ulmus americana/s

Small trees, shrubs and vines

Cephalanthus occidentalis

Cornus ammomum/c

Cornus stricta

(*Rosa palustris*/C)

Rosa setigera/m

Salix interior s.l./r

Sambucus canadensis/m

Typical ferns and allies

Onclea sensibilis/C

Aquatic and subaquatic herbs

Alisma subcordatum/p

***Heteranthera limosa*/p

**Heteranthera reniformis*/p

Lemna minor/P

**Lemna obscura*/P

Ludwigia palustris/Cp

Ludwigia peploides/p

[status unclear]

Najas guadalupensis/CP

***Nelumbo lutea*/P

***Ranunculus ambigens*/Cp

Sagittaria australis/p

**Saururus cernuus*/p

Spirodela polyrhiza/P

**Veronica anagallis-aq.* s.l./p?

Wolffia borealis/P

Wolffia brasiliensis/P

Wolffia columbiana/P

Zannichellia palustris/P

Herbs: not legumes/composites

Agrimonia parviflora/C

****Anemone canadensis*/m

Asclepias incarnata/s

Boehmeria cylindrica/S

****Caltha palustris*/p

Cardamine bulbosa/r

Chelone glabra/C

Cuscuta gronovii/C?

***Cuscuta indecora*/s?

**Cuscuta polygonorum*

Hibiscus moscheutos/P

Lindernia dubia s.l./p

Lobelia cardinalis/C

Lycopus americanus

Lycopus virginicus/C

****Lysimachia hybrida*/p?

***Mentha canadensis*/S

Mimulus alatus/S

Persicaria hydropiperoides/p

**Ranunculus caricetorum*

Ranunculus sceleratus

Rorippa palustris/p

**Scutellaria lateriflora*/S

**Verbena hastata*/S

Typical legumes

***Cassia hebecarpa*/Cr?

Typical composites

Bidens cernua

Conoclinium coelestinum/S

[*Eupatorium*]

Eclipta prostrata/s

Eupatorium serotinum/Ch

Eupatorium perfoliatum

Eutrochium fistulosum/C

[*Eupatorium*]

Packera aurea/Cr

Solidago gigantea/r

**Symph. racemosum*/s? [*Aster*]

Typical graminoids

Carex conjuncta/h

Carex frankii/P

Carex festucacea/C

**Carex hyalinolepis*/p

Carex lupuliformis/p

Carex lupulina/p

Carex radiata/CS

Carex shortiana/S

***Carex vesicaria*/Cs?

Carex vulpinoidea/P

Cinna arundinacea/s

Cyperus odoratus/s

Cyperus strigosus/s

Echinochloa muricata/p.

Eleocharis engelmannii/Cp

Eleocharis obtusa/p

Elymus virginicus var. *v.*/m

***Glyceria septentrionalis*/c?

Glyceria striata/r

**Iris virginica*/p

Juncus dudleyi

Juncus effusus/Cp

Leersia oryzoides/p

Phalaris arundinacea/r

**Platanthera flava*/C

**Platanthera peramoena*/C

Schoenoplectus tabernaemon./p

Scirpus atrovirens/p

Scirpus cyperinus/CP

Scirpus georgianus/cp

**Spiranthes cernua*/Cs

***Spiranthes odorata*/S?

***Stenanthium gramineum*/C

Typha latifolia/P



“Mastodons eat black ash trees as the last ice age begins to abate” (from painting by Barry Roal Carlsen, University of Wisconsin Madison). Historical effects of large animals in using, enhancing and creating wetlands should be considered; mastodons once frequented the Bluegrass.



Beaver (from www.flickr.com/photos/johnecollins/6172499150/): these animals can convert free flowing riparian systems into wetlands. Now returning to the Bluegrass region, this species used to have much ecological effect—and its extinct cousin, the giant beaver, even more.