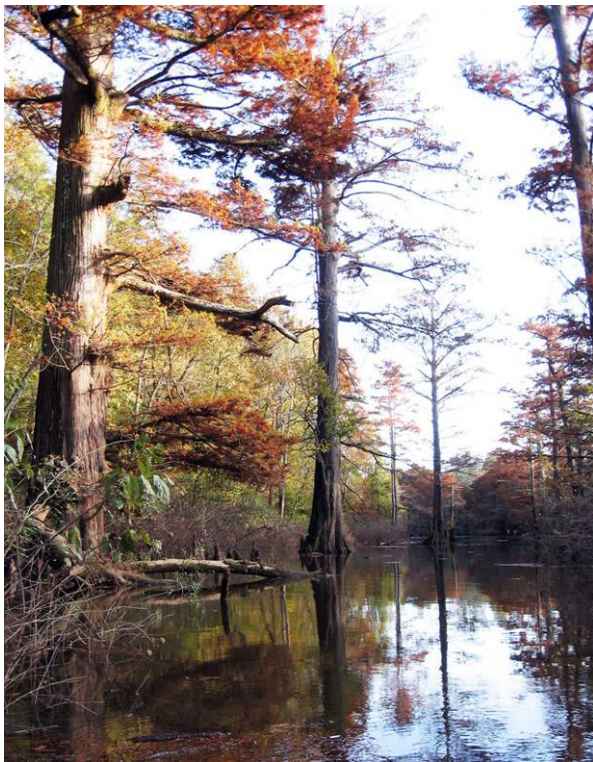


Wetland Plant Species Presence in Ecological Gradients: the Physiographic Regions of KY

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Kentucky native aquatic and wetland vegetation forms distinct communities varying with the changing physiographic regions across the state (Figure 1). The Mississippi Embayment is a low elevation area near the Mississippi River in western Kentucky characterized by bald cypress swamps, wet-mesic floodplain forests, and many aquatic and open wetland communities. The Interior Low Plateaus is a wide ranging region characterized by limestone geology and containing mostly artificial lakes and ponds, wet-mesic flatwoods and floodplain forests, and many miles of riparian wetland habitat. The Appalachian Plateau is the eastern section of Kentucky characterized by acidic wetlands, flatwoods, and riparian forest. Some plants find their habitat requirements met in every physiographic region like duckweed (*Lemna minor*). Other plants are restricted to local habitats such as sphagnum moss (*Sphagnum* spp.), which occurs only in acidic wetlands.



Mississippi embayment, photo by Neil Pederson

Mississippi Embayment (ME) vegetation is a northern terminus of the coastal plain plant community extending from the Gulf of Mexico up the Mississippi River as far as Southern Illinois. Plant communities are dominated by hydrophytes generally tolerating seasonal or permanent flooding. Emergent plants of shorelines include *Zizaniopsis miliacea* (southern wild rice), *Echinodorus cordifolius* (creeping burhead), *Sagittaria montevidensis* (Mississippi arrowhead), *S. graminea* (grass leaved sagittaria), *Pontederia cordata* (pickerel weed), and the wide ranging species *Leersia oryzoides* (rice cut grass), *Sagittaria latifolia* (broad leaved arrowhead), and *Equisetum hyemale* (horse tail). On the banks of shores grow commonly widespread deciduous trees and shrubs such as *Amorpha fruticosa* (false indigo), *Asimina triloba* (pawpaw), *Diospyros virginiana* (persimmon), *Morus rubra* (red mulberry), *Acer saccharinum* (silver maple), *A. negundo* (box-elder maple), *Rhus glabra* (smooth sumac), and *Cornus drummondii* (rough leaved dogwood). Other more restricted ME wet-mesic forest trees are *Quercus texana* (Nuttall's oak), *Q. pagoda* (cherrybark oak), *Q. lyrata* (overcup oak), *Quercus michauxii* (swamp chestnut oak), *Taxodium distichum* (bald cypress), *Carya illinoensis* (pecan hickory), *Gleditsia aquatica* (water locust), and *Celtis laevigata* (sugarberry). Understory trees are *Forestiera acuminata* (water privet), *Planera aquatica* (plane tree), and *Ilex decidua* (swamp holly). Many lianas are present including *Toxicodendron radicans* (poison ivy), *Parthenocissus quinquefolia* (Virginia creeper), *Berchemia scandens* (supple jack), *Ampelopsis arborea* (raccoon berry), and *A. cordata* (raccoon-grape). Herbaceous layer plants are *Leersia lenticularis* (catchfly grass), *Lobelia cardinalis* (cardinal flower), *Polygonum* spp. (smartweeds), *Diodia virginiana* (buttonweed), *Mikania scandens* (climbing hempweed), *Boehmeria cylindrica* (false nettle), *Hibiscus laevis*

(smooth rose-mallow), *Impatiens capensis* (jewel weed), and the woody grass *Arundinaria gigantea* (giant cane). This region also contains a high proportion of open wetland and aquatic species: *Cabomba caroliniana* (fanwort), *Limnobium spongia* (frog's bit), *Hydrocotyle ranunculoides* (water penny), *Azolla caroliniana* (mosquito fern), *Nelumbo lutea* (water lotus), *Nuphar advena* (yellow pond-lily), *Potamogeton* spp., and many others.

In the Interior Low Plateaus (IP), wetlands often are seasonal due to karst topography which drains the vernal streams into limestone. Soils in this area are basic to neutral in pH and many calcium associated plant species occupy the drainages of both the Mississippian limestone and Ordovician limestone regions of Kentucky. In wet-mesic forests along riparian corridors *Fraxinus pennsylvanica* (green ash), *Ulmus americanus* (white elm), *Acer saccharum* (sugar maple), *A. rubrum* (red maple), *Nyssa sylvatica* (blackgum), *Quercus imbricaria* (shingle oak), *Q. palustris* (pin oak), *Quercus macrocarpa* (bur oak), and *Quercus bicolor* (swamp oak) are all adapted to fertile silt-loam creek terraces, flatwoods, and swampy depressions. In some cases blackgum, redmaple and wetland oaks form dominant stands. Also present in wet-mesic creek uplands are *Fraxinus americana* (white ash) and *Juglans nigra* (black walnut). Sycamore (*Platanus occidentalis*) and silver maples are important trees stabilizing banks of eroding creeks, especially in localities where agriculture has accelerated runoff pollution. Understory and brushy ecotones contain



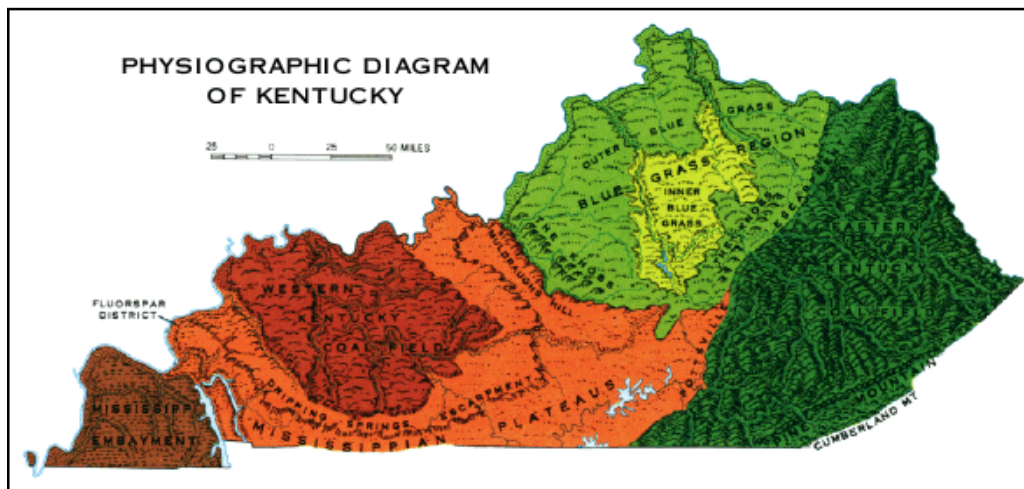
Interior Low Plateau, KSNPC file photo

small trees and woody shrubs such as *Carpinus caroliniana* (musclewood), *Viburnum prunifolium* (black haw), and *Ostrya virginiana* (ironwood). Herbs include *Lobelia siphilitica* (blue lobelia), *Agrimonia parviflora* (swamp agrimony), *Eupatorium perfoliatum* (boneset), *Symphotrichum nove-angliae* (New England aster), *Asclepias incarnata* (swamp milkweed), and *Euthamia graminifolia* (grass leaved goldenrod). Often, *Scirpus atrovirens* (dark green bulrush) or *Juncus tenuis* (path rush) accompany the many grasses (*Dichanthelium* spp. and *Elymus* spp., etc.) and sedges (*Carex* spp). In permanently flooded open wetlands (ponds, marshes) emergent and aquatic plants adapted to eutrophic (nutrient rich) conditions exist. Common plants of aquatic open water are *Najas guadalupensis* (southern water-nymph), *Potamogeton nodosus* (longleaf pondweed), *P. foliosus* (leafy pondweed), and non-natives such as *Najas minor* (eutrophic water-nymph) and *Myriophyllum* spp (water-milfoils). Emergent marsh species include *Alisma subcordatum* (water plantain), *Typha latifolia* (broad leaved cattail), and many species of sedges and rushes.

In the Appalachian Plateaus (AP) region many wetlands have sandy and organic soils causing acidification especially where conifers or sphagnum mosses are present. Along sandy rivers *Betula nigra* (river birch) lines the shore. Forested wetlands are often dominated by blackgum and redmaple, along with sourwood (*Oxydendrum arboreum*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*), and understory shrubs include *Vaccinium corymbosum* (high-bush blueberry), *Ilex opaca* (American holly), *Ilex verticillata* (winterberry holly, and wild azaleas (*Rhododendron* spp.)). Interesting aquatic plants include the slippery *Brasenia schreberi* (water shield) and the carnivorous *Utricularia gibba* (bladderwort). Emergent plant species such as *Proserpinaca palustris* (mermaidweed) and *Iris virginica* (wild blue iris) inhabit these marshy wetlands.

Each of these regions holds unique species indicative of different soils and natural histories of the plant communities. Over time plants adapted to the qualities present in habitats of the ME, IP, and AP; separated themselves into niches along ecological gradients where moisture, exposure, disturbance, and nutrient availability (etc.) shaped species composition. Species

with narrowly restricted habitat requirements are only found in typical specialized conditions. Some species can grow across physiographic boundaries in Kentucky and have much more broader habitat requirements. By distinguishing these different species and their associated plant communities, many ecosystems can be descriptively understood. Often, describing the plant communities of a region can lead to greater understanding for land preservation and plant conservation, which is a main goal in ecological restoration.



University of Kentucky, <http://www.uky.edu/KentuckyAtlas/kentucky-atlas.html>

