

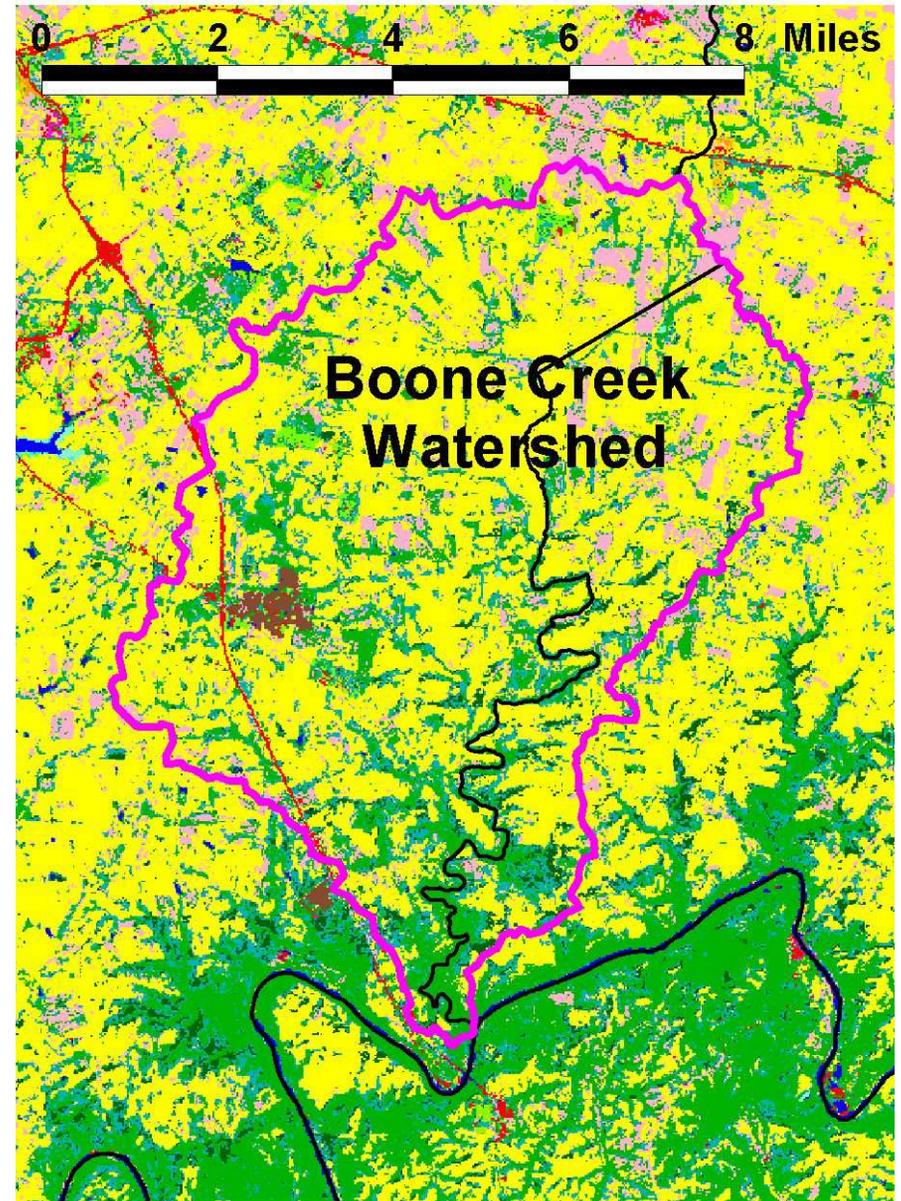
**BOONE CREEK (Fayette & Clark Counties, Kentucky):
The Need for Collaborative Focus on Real Conservation Targets.**

Julian Campbell, Jan 2012; <http://bluegrasswoodland.com>

In addition to the forested corridors along this creek and its tributaries (totaling over 20 miles), its 44-square mile watershed has high potential for conservation as a moderate-sized tributary of the Kentucky River. The watershed is almost all rural, with only the Blue Sky Industrial Park providing a concentrated source for treated sewage and other waste water. However, livestock are a significant problem in parts of the upper watershed. The only other stream of similar size in the Inner Bluegrass that clearly has more overall significance for biodiversity (terrestrial and aquatic) is Jessamine Creek, which has more development pressure (draining west side of Nicholasville).

There is wide range of natural vegetation types in the watershed, but some have been generally cleared or highly disturbed. There are some small remnants of the following imperiled types: rocky streambanks with grass-shrub complex; beech-maple forest; bottomland bur oak-shumard oak woodland; swamp white oak-green ash forest; and upland canebreak. Upland woods have been largely cleared for farming, but there is potential for local recovery of vegetation similar to presettlement times, when bison and elk provided extra impact. Karst and cave systems occur on uplands of the watershed, but no significant systems are known within the ravine corridor. Aquatic systems have been disturbed by pollution, but the biota of the creek are believed to be in better condition than most other streams of similar size in the region. Rainbow trout were stocked here in the 1960s and are a popular local item for fishing.

Several rare plants have been found in the lower Boone Creek ravine within the past 20-30 years, and a few others occur elsewhere in the watershed. The most important globally rare species, which deserve federal protection, include Bladder Pod (*Lesquerella globosa*), Water Stitchwort (*Stellaria fontinalis*) and Running Buffalo Clover (*Trifolium stoloniferum*), but the first two of these may have already disappeared from the area. No state-listed rare animal species are known to breed here, but some may occur here or could be recovered, especially grassland birds. Much more zoological research is needed.



green = woodland (darker = cedar); yellow = pasture;
pink = cropland; brown/red etc = developed land

OUTLINE OF A CONSERVATION PLAN

A careful effective plan must focus on real targets: general goals for the whole landscape or watershed; habitats that deserve special attention even if land is protected; and species that deserve special attention even if habitat is available. Clear problems and potential solutions are as follows.

A. Landscape level.

A1. General improvement in water quality, with return to a more natural standard in the creek. This will require active collaboration among landowners and managers, building on initial work by NRCS.. Such efforts should include larger farms and businesses, as well as neighborhood associations and the general public, in order to set goals for the community. There are effective governmental programs

for individuals and communities that are engaged in this work. Potential models in the region include Friends of Cane Run (Fayette & Scott Co.) and Strodes Creek Conservancy (Clark Co.).

A2. General restoration of native vegetation, especially in blocks of land along stream corridors. This should focus on expanding the riparian corridors and allowing trees to regrow on selected uplands. A few landowners are already committed, and others may eventually be encouraged with financial incentives from cost-share programs, easements and acquisitions by appropriate organizations. Again, progress will be enhanced by collaboration among landowners, establishing common goals for the ideal balance of woodland and farmland. While individual interests are varied, it is likely that more mutual discussion can advance benefits for the community.



B. Habitat level. These habitat classes deserve special focus.

B1. Riparian corridors, including the stream itself plus active floodplains. In addition to reducing excessive impacts of livestock or other effects of farming, it will be important to replant selected native plants along the streams. Currently, there are few local sources for truly native plant material, but local propagation of willows, osiers and other useful species is relatively easy.

B2. Upland woods, especially drier woods on ridges near ravines (with much oak and hickory) and transitional woods between less disturbed slopes and farmland (with much walnut and buckeye).

Native trees will generally regenerate by themselves but supplementary propagation will also be useful (e.g some oaks, hickories, basswood, sugar maple).

B3. Thin grassy woods, canebrakes and meadows, especially areas maintained with occasional seasonal browsing of livestock or wildlife management. Conditions for such vegetation vary much, and there is considerable scientific uncertainty about optimal management. Each potential site can function as a test case, and if data are pooled, then cooperative learning is possible. Again, several species will deserve special propagation (see below).



Left: white oak was formerly common on ridges near the river. Right: woodland pasture ca. 1900 near Lexington; derived from ancient woods

C. Species level. The following groups match the habitats.

C1. Aquatic and riparian species. Further research is needed to determine if selected fishes, mussels or other aquatic animals have disappeared from the creek or deserve reintroduction (consulting with Ky. Dept. of Fish and Wildlife Resources). A few common riparian trees are available (e.g. State Div. of Forestry), but native shrubs, grasses and wildflowers are generally not. There is an urgent need to establish cooperative efforts in propagation of selected species (perhaps coordinated through the Ky. Native Plant Society).

Invasive aliens: further research is needed to determine if some aliens in these habitats are serious problems that can be addressed (e.g. Japanese fingernail clam, rainbow trout).

C2. Plant species for upland woods and extensions on slopes.

While some weedy native plants will rapidly grow back into woods, many will not and some deserve special propagation. For example, Miami mist is a useful attractive wildflower that can be easily spread. Species of deeper woods tend to be slower, but often have much



interest (e.g., goldenseal, ginseng, trilliums, wood-poppy).

Invasive aliens: there are serious problems with bush honeysuckle, creeping euonymus, garlic mustard and locally other species. Further research, with comparison of various methods, is needed to determine how best to reduce these species and promote native plants. It is likely that intensive browsing for a short period during late summer to winter can help shift the balance.

C3. Plants species for thin grassy woods, canebrakes and meadows. Issues are similar to C2. Shrubby species that deserve special focus for general propagation include roughleaf dogwood and cane. A few imperiled plants can be promoted, but will need research to determine the best disturbance-regime: including running buffalo-clover (on damper ground), bladder-pod and Walter's violet.

Invasive aliens: in addition to those noted under C2, more open areas are generally dominated by alien grasses and alien legumes. However, these species of full sun tend to decline after 10-20 years, if regular annual mowing is abandoned.



Target Definition for Watershed	Current Conditions → Desired Goals	Primary Problems to be Addressed	Primary Solutions (as suggested here)	Progress to 2012 (initial impression)
A1: 44 sq. mile watershed with potential for high quality in region	fair→good, including more farmed upper sections	pollution from livestock and industrial park; lack of collaborative framework	develop community interests; promote sustainable uses	general discussion but little/no action
A2: general promotion of native vegetation, esp. blocks along streams	poor/fair→fair/good (20+ miles with width of 1000-2000+ ft)	lack of deeper shade (esp. sugar maples); lack of natives; invasive aliens	legal protection; enhance maple sites; recover natives; reduce weeds	limited progress on a few individual tracts, esp. lower section
B1: riparian corridors, including stream systems and floodplains	poor/fair→fair/good (20+ miles with width of 100-1000 ft)	excessive impacts from livestock; lack of available native species for plantings	apply USDA programs, in conjunction with new nursery effort	little progress, except on a few individual tracts
B2: upland woods, especially drier woods on ridges near ravines	poor→fair/good (1000+ acres can be defined)	land use for marginal farming; lack of native plants; aliens instead	establish simple trials with selected species that deserve propagation	little/no progress
B3: thin grassy woods, canebrakes and meadows	poor→fair/good (1000+ acres can be defined)	land use for marginal farming; lack of native plants; aliens instead	establish simple trials with selected species that deserve propagation	little/no progress, except in some meadows on Martin
C1: aquatic and riparian species; to be determined with further research	to be determined	to be determined; include study of invasive aliens; eg. Japanese finger-nail clam	to be determined; establish potential for propagation of selected species	to be determined
C2: plant species for upland woods and extensions on slopes.	poor/fair→good (but will need many decades of work)	absence of starts; slow dispersal/spread in some species; alien invasives	develop native plant collection, nursery, trials, research, demonstration	little/no progress, but Martin farm offers much seed to begin
C3: plant species for thin grassy woods, canebrakes and meadows	poor/fair→good (most can be planted; some slow to start)	absence of starts; slow dispersal/spread in some species; aliens invasives	develop native plant collection, nursery, trials, research, demonstration	little/no progress, but Martin farm offers much seed to begin

RARE AND UNCOMMON SPECIES

The vegetation of the Boone Creek area has been intensively searched during the past 20-30 years by botanists with KSNPC and TNC.

Before then, Mary Wharton (late professor of botany at Georgetown College) made many trips to this area during 1930-1970, and her specimens are housed at University of Kentucky and Eastern Kentucky University. In earlier times, there is little record of botanical survey, but there were several collections made by Charles Wilkins Short and Robert Peter in the mid-19th Century.

PLANTS

Listed rare species. The following are listed by state or federal government as rare and deserving special protection. Abbreviations before names are used in field maps to show locations. Ranks after names indicate approximate degrees of global (G) and state (S) rarity. In general: 1 = endangered; 2 = threatened; 3 = moderately rare; 4 = geographically restricted; 5 = widespread (in east-central North America). However, further review of ranks is needed.

Juglans cinerea, Butternut (White walnut); G2/3; S2/3

A few trees of this species were observed scattered along the lower ravine of Boone Creek during ca. 1978-80, growing on terraces close to the streambanks. However, none have been found during 1990-2001. Due to diseases, this species has declined greatly in the region.

Lesquerella globosa (= *Physaria g.*), Bladder Pod; G1; S1

This globally endangered species in the mustard family has been observed along rocky roadsides, trails and field edges near the Grime's Mill bridge and adjacent slopes. However, only a few scattered plants may still occur, with irregular appearance from year to year. The species appears to be an erratic biennial species with populations that do not flower every year. The last record was ca. 1990.

Piptatherum racemosum (= *Oryzopsis r.*), Black-seed Rice-grass; G4; S3

This grass has been found on a narrow rocky ridge (lead) in the lower ravine of Boone Creek. It occurs in subxeric or xeric oak-ash and red cedar woods.

Prunus virginiana, Choke Cherry; G5; S2

This shrub is common further north in North America, but in Kentucky it is known only from the Kentucky River Palisades region. A few clonal patches were recently discovered in the lower Boone Creek ravine on the Martin lands.

Schizachne purpurascens, Purple Melic-grass; G4; S2/3

This grass has been found on two narrow rocky ridges (leads) in the lower ravine of Boone Creek. It occurs in xeric to subxeric red cedar and oak-ash woods.

Stellaria fontinalis (= *Arenaria f.*), Water Stitchwort; G1; S1

This globally endangered species in the chickweed family was known from a dripping cliff-face crest on the Sladen (later Vaughn) tract opposite the Iroquois Hunt-Club during the 1970s. However, it disappeared here in the 1980s, apparently due to excessive drying up of the spring that fed this small ephemeral waterfall. Pond construction upstream may have been involved, although Mrs. Sladen suggested that the 1980 earthquake had some effect instead.

Trifolium stoloniferum, Running Buffalo Clover; G2; S2.

This globally threatened species in the legume family has been found at a few scattered sites along washed out streambanks and adjacent trails in the Boone Creek ravine. During the early 1990s it was found on streambanks in the lower ravine section, but it could not be found here in 2000-01. In 2000 it was found behind the Iroquois Hunt Club, and these plants may persist so long as the path is maintained together with occasional mowing below the swimming pool. This species depends on disturbance in the woods—it cannot survive in dense, undisturbed forest, or in full sun with excessive competition from taller herbs and grasses. Proper management of small patches should include careful mowing or trail maintenance, perhaps with hand-weeding as well. The plants will benefit from being mowed or trampled for most of the year, but during flowering and seeding (May and June) these disturbances should probably be reduced. It is currently listed as "endangered" by the U.S. Fish & Wildlife Service, but when its best populations are secured with appropriate management, it will probably be changed to "threatened".

Viburnum molle, Round-leaved Arrow-wood; G4; S2

In Kentucky, this shrub is known only from the Kentucky River Palisades ravines. A few scattered plants have been seen in rocky woods in the lower ravine, including the Martin lands.

Viola walteri, Walter's Violet; G4; S2

This violet is known from two narrow ridges or "points" in the lower Boone Creek ravine, on or adjacent to the Martin lands. It occurs on rocky pavement within red cedar/oak-ash woods.

Other species of interest. These are not endangered or threatened, but they are uncommon to rare in this region, or have declined greatly since settlement.

Arundinaria gigantea, Cane; G5; S5

Although this species was probably once abundant in much of the watershed, it is now very rare. Only one locality (around the Athens exit of I-75) has extensive

remnants, with a few patches of 1-5 acres. The only other site known is along a small fencerow strip along Old Richmond Road near the head of Boggs Fork.

Aster macrophyllus (= *Eurybia m.*), Broadleaf Aster; G5; S4

This species is fairly frequent in Appalachian Kentucky and other regions with acid, infertile soils, but it is rare in the Bluegrass Region. It has been found on upper slopes in the lower Boone Creek ravine.

Aster phlogifolius (= *Symphytichum p.*), Soft Clasping-leaved Aster; G4; S4

This species is also known mostly from Appalachian regions of the state, and is rare in the Bluegrass Region. It was found near the *A. macrophyllus* site in the lower Boone Creek ravine.

Collinsia verna, Blue-eyed Mary; G4; S4

This showy annual in the figwort family is locally abundant in the Bluegrass Region, but its populations are thinly scattered. It seems to do best in submesic woods that are recovering from grazing, but it may eventually decline in deep shade of undisturbed forest with much sugar maple. It occurs in the lower Boone Creek ravine on lower slopes and bottoms.

Corylus americana, Hazel-bush; G5; S5

This species is common in most of Kentucky, but rare in the Bluegrass Region, where the only recent records are from the Eden Shale Hills. It has been reported from the Boone Creek area (W. Meijer & R. Cranfill, 1970s, pers. comm.), but not relocated in recent years.

Panax quinquefolius, Ginseng; G4; S3/4

This medicinal herb has been greatly reduced throughout the state, and there are very few recent records from the Inner Bluegrass. It was reported from the lower Boone Creek ravine by Ed Hartowicz (pers. comm.).

Quercus bicolor, Swamp White Oak; G4; S4

This tree is confined to wet terraces and upland swales with moderately to highly fertile soils. It is known from only 15 sites in the central Bluegrass, most of which are small, threatened woodlots surrounded by farmland. The Boone Creek watershed has three known sites.

Quercus imbricaria, Shingle Oak; G5; S4

Though not really rare in the region, this entire-leaved oak is included here because it is largely absent from the Inner Bluegrass but appears scattered along the eastern transitions of this region in the Boone Creek area. It may have been typical of a variant of "savanna-woodland" on less fertile soils.

Schizachyrium scoparium (= *Andropogon scoparius*) Little Bluestem; G5; S5
This grass is abundant in most of Kentucky, but very rare in the Bluegrass Region. A few plants have been found on the rocky banks of the Kentucky River at the mouth of Boone Creek.

Solidago rupestris, Riverbank Goldenrod; G3/4; S3

This showy goldenrod is confined to rocky calcareous banks of larger streams. It is scattered along the Kentucky River in the central Bluegrass, and one patch occurs by the mouth of Boone Creek.

Synandra hispidula, White Wood-beauty; G3/4; S3/4

Though once considered globally threatened, this showy woodland flower in the mint family is now known to be widespread in Kentucky. Nevertheless, it is largely confined to relatively good remnants of mesic forest, which occur mostly in more protected ravines. Due to its biennial life-cycle flowering in often absent in alternate years. Several large populations occur in the lower Boone Creek ravine, including 1000s on the Martin lands.

ANIMALS

There has been little survey for rare animal species along Boone Creek, but there is some potential for rare insects, mussels, fishes, birds and mammals. Within a few miles of Boone Creek, there are records of the rare Least Weasel, Indiana Bat and Gray Bat. There should be a special effort to search for these bat species, since they are federally protected.

Within the forests of the Palisades region, there have been relatively few records of rare bird species (especially globally declining neotropical migrants). However, several rare grassland species have been seen in less intensively mowed pastures and old fields of the central Bluegrass. With appropriate mowing schedules, generally waiting until about August 1st to mow, it is possible to manage for these species, e.g., grasshopper sparrow, savannah sparrow, henslow's sparrow, bobolink, etc. (B. Palmer-Ball, Ky. State Nature Preserves Commission, pers. comm.).

The return of beaver to the area within the past 20 years is striking. Trees are frequently chewed on along streambanks, especially green ash.



Property along Boone Creek includes the ruins of a mill built about 1803. Photos by Tom Eblen.
Read more at: <http://www.kentucky.com/2012/01/23/2039305/neighbors-taking-care-of-boone.html#storylink=cpy>