

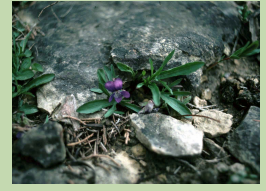
In the Spotlight:

Dolomite Glade and Barrens

By Brian Yahn, Vegetation Ecologist



Kentucky glade cress



Eggleston's violet

One of Kentucky's rarest natural communities (KSNPC-listed as state endangered) is the Dolomite glade (KSNPC 2009). Glades are open, exposed bedrock areas dominated by drought-adapted herbs and grasses in an otherwise woodland or forest setting (Nelson 2005). They are mostly found on very dry hillsides that often face to the south and/or west. Dolomite is a type of limestone (sedimentary rock) that is rich in magnesium carbonate, creating soil characteristics that support species compositions distinct from that of non-dolomitic limestone. Dolomite glades occur only within a small area of Kentucky, essentially southeastern Bullitt County (just south of Louisville). Degraded dolomite glade and barren remnants extend

just into southern Jefferson and northern Nelson counties. Outside of Kentucky, grassland communities similar to our Dolomite glades are found in surrounding states; nearly all are rare communities (NatureServe, the international authority on the status of rare species and natural communities, 2014).

Kentucky's Dolomite glades are distinctive and part of a unique

system of glades and barrens (open woodlands) unlike anywhere else in Kentucky and beyond. Only a small number of Dolomite glades have been documented in Kentucky, limited to areas where dolomite occurs and requiring specific conditions to develop. The rocky or thin soil glades are very small (usually < 5 acres) and the surrounding prairie and woodlands not much larger (remaining sites < 75 acres). Of the sites that remain, several have been damaged by human disturbances (e.g. grazing, erosion). Due to these factors, NatureServe lists this community as globally critically imperiled (=G1Q). How this community relates to similar dolomite glades in surrounding regions is still being determined; currently it is thought to be endemic to Kentucky.

As mentioned above, Dolomite glades usually occur on gradual slopes with an aspect south and west, but development also occurs along east-facing slopes. Soils are shallow, very well drained and often gravelly with little organic content. The dolomitic bedrock is near or at the surface and bedrock ledges, slabs and rock fragments

are usually present. The glades have a sparse grass cover with a good diversity of herbaceous species, including many annuals. Many prairie and barren species can occur too, but are usually found on the margins or in pockets where soil is deeper. The glades can vary in shape but often extend along the contour of the slope (i.e. long length, thin width). Fire and winter frost heave, two types of natural disturbance, play an important role in helping to maintain glades. Without this disturbance, glades can be invaded by woody vegetation, which shades open areas and leads to a build-up of soil, eliminating habitat for glade associated species. Pre-settlement, large herbivores grazed in openings and helped maintain glades as well,

but information on their cycles and specific impact was not well documented. The prairie and barrens (open woodland) communities that usually surround the glades, have deeper soil and a dense herbaceous layer of perennial grassland species. Regular fires maintain open conditions and promote an abundance of grassland species.

Woody plants are often absent or

restricted in growth due to droughty, poor conditions, but are more abundant in the surrounding woodlands/barrens. The few trees and shrubs that can withstand such conditions are often gnarled and stunted. These hardy species include blackjack oak, Carolina buckthorn, chinquapin oak, eastern redbud, eastern red-cedar, persimmon and post oak. The herb layer, often sparse, is dominated by drought-tolerant plants. Annual dropseed is the dominant grass in gravelly or bedrock areas, and little bluestem dominates in areas of slightly deeper soil. Characteristic wildflowers include bastard toadflax, elliptical rushfoil, false aloe, flatstem spikerush, gaura, hoary puccoon, Leonard's skullcap, obedient plant, pale purple coneflower, prairie tea, roundfruit St. Johnswort, scaly gay-feather, slender heliotrope and tall gay-feather. Common (but not necessarily abundant) species in the surrounding deeper-soiled prairie and woodlands include big bluestem, yellow Indian-grass, little bluestem, prairie rosinweed, tall gay-feather, tall tickseed and others.

Aerial view of dolomite glade ~ KSNPC photo Brian Yahn



Dolomite glades provide habitat for many unusual plants found nowhere else in Kentucky. Nine KSNPC-listed plant species have been documented on or in close association with Dolomite glades and barrens/woodlands (KSNPC 2014). These include the barrens silky aster, Eggleston's violet, Great Plains ladies'-tresses, hairy fimbriatylis, prairie dropseed and purple prairie-clover (see more highlighted below). A unique feature of many Dolomite glades (i.e. those with well-developed flat to gently sloping slabs of bedrock) is the development of seasonal wet areas that provide habitat for an additional suite of rare plants. These include Crawe's sedge, ringseed rush and the endemic Kentucky gladecress. These tough plants thrive under the wet-saturated conditions of early spring, but also have the ability to survive harsh, dry conditions throughout the rest of the growing season. A blue-green algae called nostoc or star-jelly is found here too, swelling into a jelly-like mass that is characteristic during wet periods.

Dolomitic glades also provide habitat for many animal species, including fence lizards, indigo buntings, prairie warblers, scorpions and numerous species of butterflies and moths.

Although more stable (disturbance tolerant) than other natural communities (due to solid bedrock coverage and dominance by drought-hardy vegetation), dolomitic glades are still vulnerable to human disturbance. The thin soils can easily be eroded by livestock activity or vehicle traffic. This type of disturbance provides ideal conditions for non-native species invasion (such as spotted knapweed, white and yellow sweetclover and Japanese honeysuckle). The exposed bedrock also makes the glade community attractive to quarrying (i.e. mining rock). In these operations, the glades are usually destroyed. Of the few dolomitic glades that remain in Kentucky, several have been damaged or degraded. KSNPC and The Nature Conservancy recognize the importance of protecting these few remaining sites in the Commonwealth. Two sites have been protected, Apple Valley Glade State Nature Preserve and Pine Creek Barrens, both in Bullitt County. Further support from landowners can help conserve the few areas that remain in private ownership. (For more information see also newsletter 66: Summer 2011 on limestone glades)



References:

Jones, R. L. 2005. Plant life in Kentucky. University of Kentucky Press, Lexington, KY.

[KSNPC] Kentucky State Nature Preserves Commission. 2009. Natural communities of Kentucky. Working draft. Frankfort, KY.

[KSNPC] Kentucky State Nature Preserves Commission. 2014. Kentucky Natural Heritage Database. Kentucky State Nature Preserves Commission, Frankfort, KY.

NatureServe. 2014. NatureServe Explorer Worldwide Web database. <http://www.natureserve.org/explorer>. Accessed in August of 2014.

Nelson, P. W. 2005. The terrestrial natural communities of Missouri. Missouri Natural Areas Committee, Jefferson City, MO.



Species associated with Dolomite Glade and Barrens:

Dusted Skipper

Atrytonopsis hianna

KSNPC Status: None

Flight Season: In Kentucky, adults are active during May

USFWS Status: None

General Description: Wings above are brown with a few white spots on forewing. Underside of hindwing is brown with white dusting on rear one-third and usually at least one white dot at the wing base. Face has a “bandit mask” appearance. Wing span is approximately 1.25 – 1.7 inches.

Habitat: Open grassy areas, especially glades, prairies, and barrens that support good populations of the caterpillar’s host plants, little bluestem (*Schizachyrium scoparium*) and big bluestem (*Andropogon gerardii*).

Range: North America, including southern Canada, but absent west of Wyoming and Colorado. In Kentucky this species is usually found locally in small colonies and often associated with high quality habitat.



Chuck-will’s-widow

Antrostomus carolinensis

KSNPC Status: None

USFWS Status: None

General Description: The Chuck-will’s-widow is a relatively large bird ranging in length from 11 to 12.6 inches with a wingspan of 22.8 to 24 inches. Individuals have warm brown tones with intricately patterned feathers making them extremely well-camouflaged. The wings are entirely brown; the outer tail feathers have white inner webs. The Chuck-will’s-widow’s most apparent behavior is its incessant calling at night. They do most of their foraging at dusk and dawn but extend their activity during full moons. They are buoyant and maneuverable in flight, catching flying insects with a short dive or chase followed by a snap of the bill.

Habitat: Chuck-will’s-widows are most common in dry woodlands in the southeast, from pine barrens to oak-hickory and mixed deciduous woodlands. Adults typically breed in the same habitats from the Southeast to the Mid-Atlantic states. They tend to live in more open areas, which is why glade and prairie-barren communities - relatively small openings surrounded by woods - provide great habitat.

Range: Populations are found throughout the Southeast, and in parts of the Mid-Atlantic and the southeastern Mid-West states. Kentucky populations are most abundant in the southern and western part of the state, becoming rare in the Cumberland Plateau and the northern and eastern Bluegrass. In winter Chuck-will’s-widows migrate south of Kentucky, preferring brush, woodlands, hedgerows, thickets, and fields as far south as Colombia, Venezuela, and the Caribbean. **Note: the majority of this information comes directly from the [Cornell Lab of Ornithology website](#); accessed August of 2014.



Photo courtesy Dick Daniels (CreativeCommons)

Kentucky Glade Cress

Leavenworthia exigua var. laciniata

KSNPC Status: Endangered

Flowering Period: Early March to late April

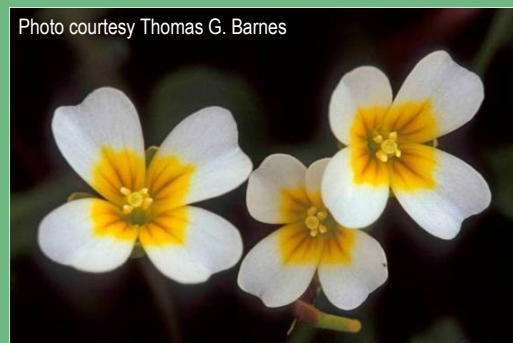
USFWS Status: Threatened

Range: Kentucky: Bullitt and Jefferson counties

Habitat: In full sun on flat-bedded outcrops of Silurian limestone or dolomite in shallow soils of glades, rock outcrops, pastures and lawns.

General Description: Kentucky Glade Cress is a small plant in the mustard family. It has small white to lavender flowers (less than 10 mm in length) with petals that have a notch. The fruits are flattened. The terminal leaf lobe is notably larger than the lateral lobes

Reasons: Kentucky Glade Cress is endemic to Kentucky, meaning it occurs in Bullitt and Jefferson counties in Kentucky and no where else in the world. It has a tremendously small range for a plant. Unfortunately, its habitat is experiencing a tremendous amount of development pressure, being in and near the largest city in Kentucky -- Louisville. The majority of Kentucky Glade Cress populations have been converted to subdivisions, with some plants still clinging on to edges of residential lawns. There are a few protected populations in high quality glade communities, and these glade communities need to be managed for invasive species and also need periodic fire and cedar removal to keep the glades open.



Accounts written by Ellis Lauder milk, Brian Yahn, Tara Littlefield, respectively.

