

## In the Spotlight: *Limestone Slope Glades*

by Brian Yahn, Vegetation Ecologist, Summer 2011

Have you ever heard of a glade before? Did you know glades are a good place to find scorpions, glass lizards and prickly-pear cactus?

Glades are open, exposed bedrock areas dominated by drought-adapted herbs and grasses in an otherwise woodland or forest setting (Nelson 2005). One of Kentucky's most unique natural communities (KSNPC-listed as state special concern =S3) is the limestone slope glade. Glades are mostly found on very dry hillsides that often face to the south and/or west. Most of the limestone slope glades naturally occur in west-central Kentucky, within a large physiographic area known as the Highland Rim (i.e. in an area ranging roughly from Bardstown west to Hopkinsville). Outside of Kentucky, communities similar to our limestone slope glades are found scattered throughout surrounding states from the Midwest and Southeast up through southern New England.

Kentucky's limestone slope glades are distinct from most of the limestone glades in other states. Although over 40 have been documented in Kentucky, most are extremely small (less than 4 acres) and many have been damaged by human disturbances (e.g. grazing and erosion). Due to this, NatureServe (the national authority on the status of rare species and natural communities) lists this community as globally vulnerable (=G3). How this community relates to similar limestone glades in surrounding regions is still being determined.

The limestone slope glade occurs on moderate to steep slopes with an aspect usually south and west. Soils are shallow to very shallow, very well drained and they are often gravelly with little organic content. Bedrock limestone is usually near or at the surface and bedrock ledges, slabs and rock fragments are usually abundant. Vegetation is characterized by moderate to incomplete grass cover with a good diversity of herbaceous species, including many annuals. Many prairie species can occur but are usually found on the margins or in pockets where soil is deeper. The glades can vary in size but often they are narrow and long in shape (i.e. linear) and follow the contour of the slope.

Woody plants are often absent or restricted in growth due to droughty, poor conditions. The trees and shrubs that do occur are usually gnarled and stunted. The most common trees

and shrubs occurring in and surrounding glades include blackjack oak, Carolina buckthorn, chinquapin oak, eastern redbud, eastern red-cedar and post oak. The herb layer can range from sparse to sometimes dense, dominated by drought-tolerant plants. Common or characteristic graminoids (grasses) include big bluestem, yellow Indian-grass, little bluestem, poverty oat-grass, sheathed dropseed and side-oats grama. Common and characteristic wildflowers (forbs) include false aloe, false pennyroyal, hairy wild-petunia, pale purple coneflower, pale-spike lobelia, slender heliotrope, hoary puccoon, roundfruit, St. John's-wort and scaly gay-feather. Other less abundant but characteristic plants include bird's-foot violet, blue waxweed, Eggleston's violet, heart-leaved noseburn and prickly-pear cactus.

A unique feature of many slope glades (i.e. those with well-developed flat to gently sloping slabs of bedrock) is the development of seasonally wet areas which provide habitat for unique species to grow. These species thrive under the wet-saturated conditions of early spring but have adapted to survive the harsh, dry conditions throughout the rest of the growing season. Some of these species are extremely rare and include butler's quillwort, Crawe's sedge and necklace glade-cress.

Limestone slope glades provide habitat for unique species of plants and animals found nowhere else in Kentucky. Nearly 50 KSNPC-

listed species have been documented on or in close association with limestone slope glades (KSNPC 2011). Some additional rare species associated include the chestnut sedge, eastern slender glass lizard, scarlet Indian paintbrush, southeastern five-lined skink, eastern red-bellied tiger beetle, small white lady's-slipper, great plains ladies-tresses, stemless evening-primrose and whitewashed rabdotus (snail). Other unique critters often found in glades include fence lizards, indigo buntings, prairie warblers, scorpions, six-lined racerunners and numerous species of butterflies and moths.

Although more stable (disturbance tolerant) than other natural communities, due to abundant bedrock exposure and dominance by drought-hardy vegetation, glades are still vulnerable to human disturbance. Many glades have such thin soils that light grazing by cows or traffic by heavy machinery can initiate soil erosion that can scar the glade for years into the future. Consequently, the erosion and shifting soils provide ideal conditions for non-native species invasion (species like spotted knapweed and Japanese honeysuckle). The exposed bedrock also makes glades attractive for quarry operations. Also, many glades were originally larger in size but due to decades and sometimes centuries of fire suppression, they have been invaded by red-cedar, redbud and other drought tolerant trees. In these areas, fire plays a critical role in maintaining open conditions.



Limestone slope glade ~ KSNPC photo by Marc Evans



## Eastern Red-bellied Tiger Beetle

*Cicindela rufiventris rufiventris*

**KSNPC STATUS:** None

**USFWS STATUS:** None

**GENERAL DESCRIPTION:** An approximately one-half inch long tiger beetle with the top of the head, thorax and abdomen dark brown to black, the latter usually with white or cream-colored spots on the front corners, just past the middle, and along the posterior edge. Underneath the dark wing covers is the abdomen, which is brownish red to orange.

**HABITAT:** Dry upland with rocky outcroppings and sparsely vegetated openings in forests. In Kentucky it is often found in glades or barrens, but also occurs on rock outcrops in the eastern part of the state.

**FLIGHT SEASON:** Adults are active during the summer.

**RANGE:** The eastern subspecies occupies much of the eastern United States, but is absent from the Atlantic Coastal Plain in the southeast.



Photo by Ellis Lauder milk, KSNPC

## Great Plains Ladies'-tresses

*Spirathes magnicamporum*

**KSNPC STATUS:** Threatened

**USFWS STATUS:** None

**GENERAL DESCRIPTION:** Distinguished by having linear narrowly pointed leaves absent at the time of flowering, which is in the fall. The sweet smelling flowers are white and often having a pale yellowish cast, especially on the lip. They are arranged in a dense, cylindrical spike. Lateral sepals of the flowers spread and arch above the upper petal tips.

**HABITAT:** In Kentucky found in limestone glades and may also be found in closely related grassland communities.

**FLOWERING PERIOD:** Fall, usually in October.

**RANGE:** Widely distributed in the central United States and into Canada, with scattered disjunct populations in the southwest and southeast United States. It is rare where it occurs in the eastern U.S.

**REASON FOR PROTECTION STATUS:** Loss of grasslands through land conversion (agriculture and other uses) and suppression of natural fire.



KSNPC Photo by Nick Drozda

## Eastern Slender Glass Lizard

*Ophisaurus attenuatus longicaudus*

**KSNPC STATUS:** Threatened

**USFWS STATUS:** None

**GENERAL DESCRIPTION:** A shiny, legless lizard similar in shape and movement to a snake. Unlike snakes, however, glass lizards have moveable eyelids, external ear openings, and inflexible jaws. They typically mature to 3 feet long. They are often rich brown above (along the back) with dark markings along the sides (below the lateral groove). These dark markings are typically a combination of light and dark dashes and/or stripes.

**HABITAT:** Occupy prairies and glades in Kentucky as well as other open habitats like grassy or brushy fields and dry woodlands.

**RANGE:** Extends through the southeastern U.S. (east of the Mississippi River), reaching into southern Florida and extending north through the Coastal Plain of Virginia.

**REASON FOR PROTECTION STATUS:** Kentucky populations of this subspecies are at the northern extent of the range. Their preferred habitat of native prairies, woodlands and glades is now extremely rare in Kentucky, with most of the remaining habitat severely fragmented.



Photo by James Kiser

