



Rubbernecking for Roadside Grasslands Field Guide

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Introduction

We're partnering with the TN Department of Transportation to find and document pollinator and grassland habitat along Tennessee's roadsides. Since there well over 4,000 miles of highways to survey, we need some help! This field guide is intended to supplement the training you had previously and will serve as a resource to help you be successful in uncovering and documenting our roadside grasslands. In addition to this manual, there is a website for the Rubbernecking for Roadside Grassland project at www.segrasslands.org/rubbernecking. The purpose of the website is to share important updates, helpful links, and other resources.

We are hopeful that in the coming years, we will uncover unknown grassland remnants and rare plant populations. Of course, we won't be able to do it without your help so we are very grateful to you for spending your time on this project. While this project will result in valuable data, we hope it is also enjoyable for you!

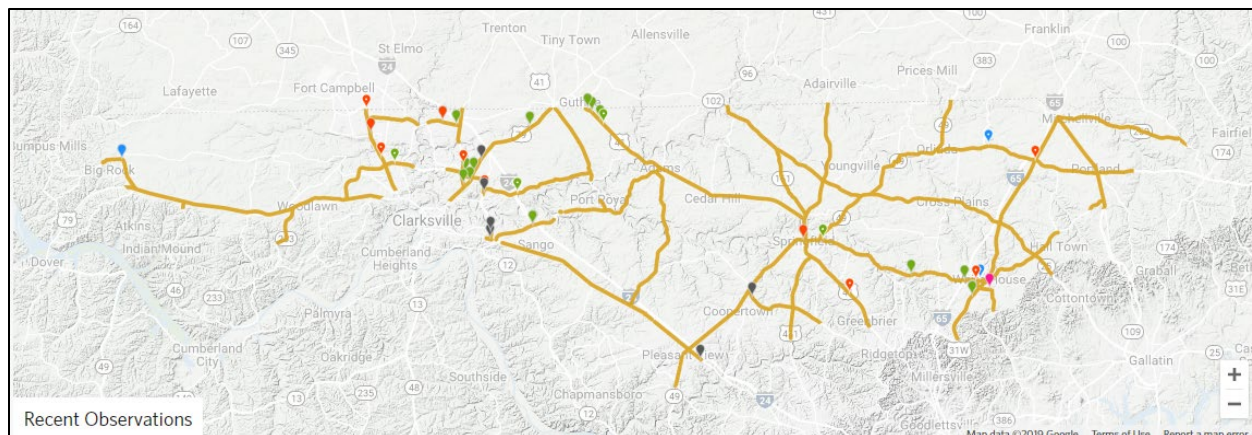
Before heading out on a survey...

WHERE TO BEGIN

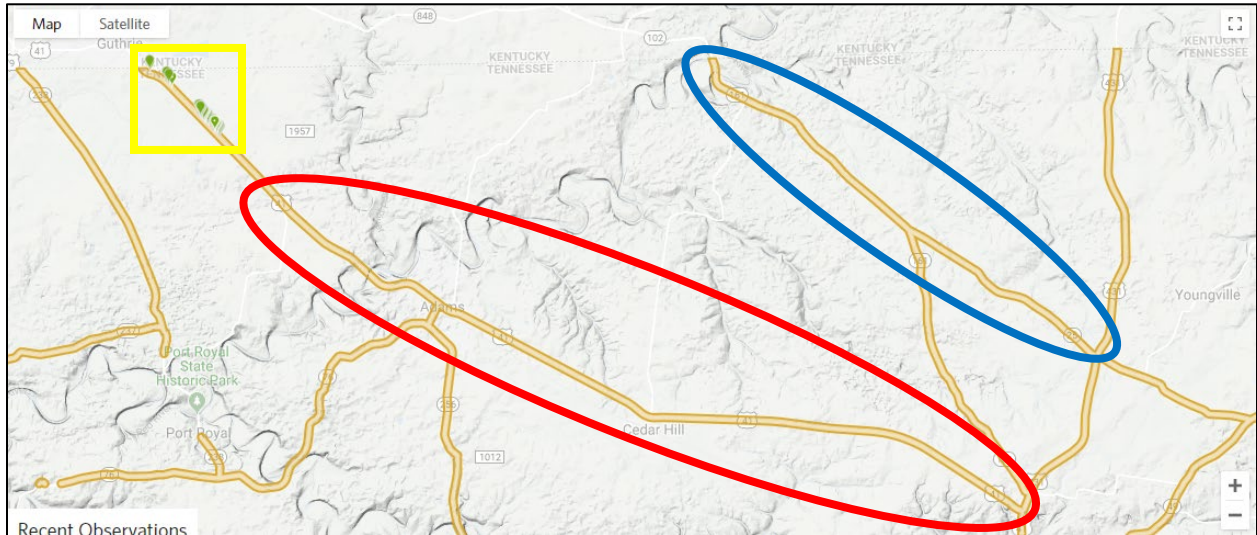
To figure out where to conduct your survey, there are two things that can inform your decision:

1) Go to the appropriate iNaturalist project in your region. All regional iNaturalist projects will be listed under the umbrella project called **Tennessee Highway Grassland Project** (www.inaturalist.org/projects/tennessee-highway-grassland-project). Regional projects will be named after the ecoregion, e.g. **Pennyroyal Karst Plain** near the Clarksville area or **Ridge and Valley** near the Chattanooga area. If you are unsure of which region you should look at, check out the map and list on the SGI project site (www.segrasslands.org/rubbernecking). You'll notice that sometimes you may want to do surveys at different ecoregions, depending on where you live and how far you want to travel.

Choosing a stretch of highway to survey will largely be up to you. To aid in that decision, click on the appropriate regional iNaturalist project page (e.g. Pennyroyal Karst Plain if you're in the Clarksville area). Scroll down the project page to see a map of the project area like the one below.



The map is interactive, so zoom in and pan around to find a relatively long stretch that doesn't have a lot of markers on it. As this project begins, you might have a relatively blank canvas to work with since many highways will not have many observations. For example, if you were to zoom in on Hwy 41 on the map above, you would notice that there are a lot of observations on the northwest section of the road (yellow box in the figure below), but the rest of the highway all the way to its intersection with Hwy 431 (circled in red in the figure) is lacking in observations. This would be one option to begin your survey. Another option could be Hwy 161/25 (the blue oval below) or any of the other highways without observations.



2) In addition to scanning the iNaturalist project maps, check out the SGI project page (www.segrasslands.org/rubbernecking) to see if there are any updates. We will post information on what specific areas need more attention or which have received a sufficient number of observations.

ON THE ROAD

Once you're on the road, it may not be obvious where to stop to conduct a survey. If you're having trouble deciding where to stop, here a few strategies to help you out:

- 1) Try approaching it systematically by stopping every mile and making multiple observations at each stop. Eventually, you will get a better feel for where to stop as you learn to recognize a high quality grassland versus a weedy roadside. If you do this, pay attention to the guidelines and tips for making observations under the CONDUCTING YOUR SURVEY section below.
- 2) Don't worry about stretches of road where the right of way is exceedingly narrow unless you happen to see a grassland indicator that suggests it is worth a stop.
- 3) Look for stretches of highway where grassy roadside strips are both fairly wide and obvious, or where there are grassy strips that exist between highway and adjacent forest.

SUPPLY LIST

- Rubbernecking for Roadside Grassland Field Guide
- Volunteer form
- Project letter from TDOT
- Orange safety vest
- Phone/camera (make sure it is charged!)
- Car charger
- Water/Food, if spending a full day out
- Recommended:* Field notebook (in case you need to jot down notes)
- Recommended:* Tennessee gazetteer (for those of you who like a hard copy map)
- Optional:* Sun protection (hat, sunscreen, etc.)
- Optional:* Bug repellent
- Optional:* Location notes, map printouts

DON'T FORGET!

- **Charge your phone before you leave!** Using iNaturalist can sometimes drain the phone's battery more quickly than other apps. Consider taking photos with the standard camera app on your smartphone and then uploading them to iNaturalist later. *Also, a note on data usage: Be aware that using iNaturalist uses data, so if you don't have an unlimited data plan, it might be beneficial to wait until you get home to upload your photo observations to iNaturalist.*
- Enable the GPS on your smartphone. This should be a default setting but please check:
 - On an iPhone, go to Settings→Privacy→Location Services and switch it on
 - For other phones, just google "[phone type] enable gps" to find clear instructions
- Let someone know where you're going before you leave

When you arrive at your site...

SAFETY

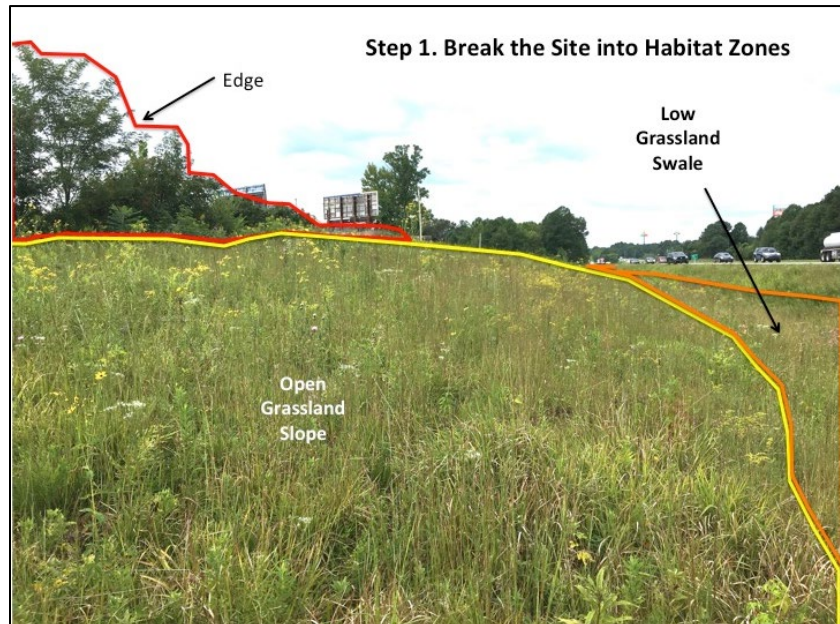
As important as this project is, a documented roadside remnant is NOT worth a trip to the emergency room (or worse)! Always be aware of your surroundings and follow these safety protocols at all times.

- Drive safely to and from your destination.
- Mind the traffic behind and in front of you. Don't slow down abruptly before pulling over.
- Turn on your hazards before pulling over to warn vehicles behind you that you are about to pull over. Keep your hazards on as you are conducting your survey.
- Pull off the road as much as possible to ensure you are clear of traffic. If there is no immediate pull-in, you may have to park down the road and walk back to the site you targeted. If this is the case, make certain you can safely access your chosen survey area.
- Visibility is key. Both your vehicle and you should be as visible as possible to other motorists.
- Put on your orange safety vest before you leave your vehicle and wear it as you conduct your survey.
- Avoid parking where motorists cannot see you from a distance, such as around a sharp curve.
- Be cautious when exiting your vehicle. Don't swing your door or step out into oncoming traffic.
- If surveying in rainy or foggy conditions, be
- Be wary of typical hazards you may encounter when working outdoors: stinging insects, venomous snakes, poisonous plants (poison ivy), and rough terrain. All are possible, depending on your location.

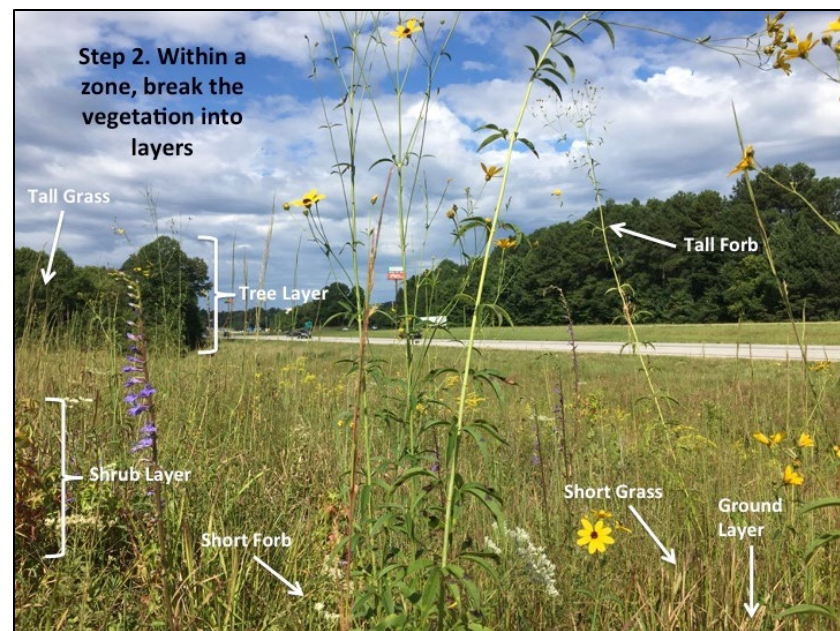
CONDUCTING YOUR SURVEY

Don't get overwhelmed! We don't expect you to document every single plant, so try these two steps to help make the project seem more manageable:

Step 1: Break the site down into zones, e.g. forest edge, open slope, swale, etc.



Step 2: Within each zone, break the vegetation into separate layers, e.g. shrub layer, short forbs, tall forbs, short grasses/graminoids, tall grass/graminoids.



Step 3: Make observations from each of the different vegetation layers in each zone. For instance, first do the forbs and grasses in the low grassland swale, then the same in the open grassland, then finish off making observations from each layer in the forest edge.

When in doubt, make an observation!

GENERAL GUIDELINES

Consider these guidelines when making an observation. They are not meant to be followed to the letter. Rather, they are simply tips you can utilize to ensure that your survey efforts are thorough. The more information we get, the better we will understand the plant communities where you conduct your surveys.

- 1) When in doubt, make an observation. Weedy or common species can be just as telling as the more uncommon grassland indicators.
- 2) Before leaving a site, try to make at least 20 observations. If it is obvious that the site mostly consists of exotic, invasive, and weedy species, such as large stands of Johnson grass or *Sericea Lespedeza*, then this isn't necessary.
- 3) It's tempting to take photos of just flowers, but try to keep the number of flowers and grasses roughly equal.
- 4) Remember to take photos of other parts of the plant, not just the actual flowers (see more in the photography section below).
- 5) Don't forget about trees and shrubs—they can be important grassland indicators, as well.

Note: We have a team of botanists who will be helping to curate the observations made for this project. They will be confirming identifications and occasionally providing comments on your observations. Don't be surprised if you get comments such as "Nice find! This is a classic indicator of grassland remnants!" or "This is a common species and by itself is not a great indicator, maybe watch for such and such species".

Additionally, since iNaturalist is an online community, don't be surprised if you get comments or identification confirmations and/or corrections from others in the iNaturalist community that may not be part of this project. This is especially likely to happen for some of the more charismatic species. For instance, if you observe a milkweed, you'll likely see a stranger confirming it within a day of uploading the observation.



Photography

There's no shame in not being able to identify any given observation. We have a team of folks that are keeping an eye on these observations and can assist you with identifications (in addition to the rest of the iNaturalist community). However, in order to do that, we need quality photos of multiple parts of the plant to aid us with the identification. Here are some examples of what you should photograph, followed by a few tips on taking photos.

FORBS (WILDFLOWERS)

Parts to photograph:

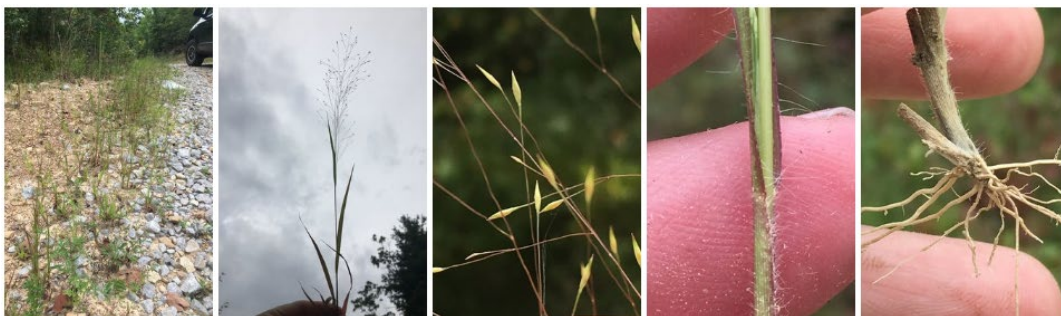
- Whole plant
- Inflorescence (the part of the plant that contains all the flowers)
- Individual flower (consider photos from different angles)
- Close up of flowering parts (sepals, petals, stamens and other parts inside the flower)
- Leaf at midstem
- Leaf at base



GRAMINOIDS (GRASSES, SEDGES, RUSHES)

Parts to photograph:

- Whole plant or silhouette of plant (hold plant up to a blue sky for best results)
- Inflorescence (the part of the plant that contains all the spikelets, i.e. grass flowers)
- Individual spikelet
- Close-up of the sheath (part of the leaf that wraps around the stem)
- Roots/rhizomes



TREES, SHRUBS, AND WOODY VINES:

Parts to photograph:

- Leafy twig
- Both sides of leaf
- How the leaf is attached to the twig
- Twig or cross-section of twig showing pith (optional)
- Flowers
- Fruiting structure (even if old)



IMPORTANT! iNaturalist only accommodates photos of individual organisms, not habitats. However, we want to see what the habitat is like in the areas you survey. To help us with this, please try to include a photo of the observed plant from a distance with the habitat in the background such as in the photo to the right. Do this in multiple observations per site so that we can get an idea of the type of plant community where your observations occur.



PHOTO TIPS FOR SMART PHONES

Tip 1: Smart phones are not good at focusing on objects close up. To remedy this, zoom in before focusing. This will allow you to hold the camera further away from the subject.

Tip 2: To focus on small structures, hold your finger or hand behind or next to the structure, and then focus the camera on your finger/hand so that the camera will have a larger object to focus on, such as in the photo to the right.



Tip 3: iNaturalist only allows you to add 4 photos initially. You can add additional photos by opening an observation, clicking “Edit”, and then clicking the “+” square next to the photos already uploaded.

Tip 4: Photograph the subject with the sun at your back or coming in from the side, especially if it’s a clear, cloudless day.

Tip 5: Consider getting a clip-on macro lens (available for cheap on Amazon)

Before you pull away from a roadside site...

There are a few things to consider before wrapping up your survey.

- 1) Ensure your GPS was enabled on your smartphone (try to do this before beginning your survey; it'll save you some time). It will be apparent it is enabled if you upload an observation on iNaturalist and the location information is already completed. If it is not enabled, make note of the location in your field notebook as specifically as possible, including the road name, which side of the road the observations were made, nearby intersections/landmarks, mile marker number, etc. You may even be able to use your phone's map app, such as Google Maps, or a free GPS app to ascertain the coordinates of your location.
- 2) Review the General Guidelines below the SURVEY section (pg. 6) to ensure you thoroughly surveyed the area. For example, did you make 20 observations? Did you get flowers, grasses, trees, and shrubs?
- 3) Jot down all the data from the Rubbernecker Data Submission Form (see page 11). You can use this to fill in the data submission form when you get home. It'll only take a minute!
- 4) Ensure you are safe to enter your vehicle and pull onto the highway.

When you get home

We are excited to see your observations! Please report each day you surveyed through our Rubbernecker Data Submission Form at www.segrasslands.org/rubberneckingdata. This includes important information we need for grant reporting purposes, such as the time you spent and number of miles you drove. Also, it will allow you to tell us more about your surveys—where you went, was the area recently mowed, etc.

If you would prefer to fill out a form by hand and send it in, you can do that, as well. There are PDF and DOC formats available for download at www.segrasslands.org/rubberneckingresources and on page 11. Simply fill those in either by hand or electronically and email it to cooper.breeden@segrasslands.org.

Project Contact Information

In the case of an emergency, call 911

For any project related questions, contact:

Cooper Breeden, Conservation Coordinator
email: cooper.breeden@segrasslands.org
mobile (call or text): 615-545-3277

Dr. Dwayne Estes, Executive Director
Email: dwayne.estes@segrasslands.org

Simplified Checklist

BEFORE HEADING OUT ON A SURVEY

- Check the iNaturalist project page to determine where to survey
- Check the SGI project page for any updates

SUPPLY LIST

- Rubbernecking for Roadside Grassland Field Guide
- Volunteer form
- Project letter from TDOT
- Orange safety vest
- Phone/camera (make sure it is charged!)
- Car charger
- Water/Food, if spending a full day out
- Recommended:* Field notebook (in case you need to jot down notes)
- Recommended:* Tennessee gazetteer (for those of you who like a hard copy map)
- Optional:* Sun protection (hat, sunscreen, etc.)
- Optional:* Bug repellent
- Optional:* Location notes, map printouts

DON'T FORGET!

- Charge your phone before you leave!
- Enable the GPS on your smartphone
- Let someone know where you're going before you leave

SAFETY PRECAUTIONS WHEN YOU ARRIVE

- Drive safely to and from your destination.
- Mind the traffic behind and in front of you. Don't slow down abruptly before pulling over.
- Turn on your hazards before pulling over and keep them on.
- Pull off the road as much as possible to ensure you are clear of traffic.
- Visibility is key. Both your vehicle and you should be as visible as possible to other motorists.
- Put on your orange safety vest before leaving your vehicle and wear it while surveying.
- Avoid parking where motorists cannot see you from a distance, such as around a sharp curve.
- Be cautious when exiting your vehicle. Don't swing your door or step out into oncoming traffic.
- When surveying in low visibility conditions, take extra precautions to make yourself visible.
- Be wary of typical outdoor hazards: venomous/poisonous/biting creatures or plants, heat, etc.

DURING YOUR SURVEY...

- Break the site down into different habitat zones, and then into vegetation layers within each zone
- Keep the GENERAL GUIDELINES in mind as you make your observations
- Take multiple photos of different plant parts for each observation

BEFORE LEAVING AND WHEN YOU GET HOME...

- Ensure your location was recorded (enable your smartphone's GPS)
- Complete the volunteer form
- Email us to let us know where you surveyed.

Rubbernecking Data Submission Form

Date of survey: _____

Name: _____

iNaturalist username: _____

Number of miles driven: _____

This is necessary information for our grant reporting purposes. Please enter the number of miles driven in your survey efforts. You can start your mileage count when you began your volunteer efforts. For instance, if you are leaving your house to survey a stretch of highway 20 miles away, include those 20 miles in your total count. Or if you were driving from one city to another on vacation and you wanted to make a few stops along the way, simply count the number of miles driven from survey site to survey site.

Number of hours spent surveying: _____

This is necessary information for our grant reporting purposes. Please enter the number of hours to the nearest quarter hour, e.g. "2.25". Similar to the miles, start counting your hours from the time you officially began working on the project, e.g. if you leave your house at 9am to drive to a site 30 minutes away, include the 30 minute transit in your figure.

Where did you survey? _____

It doesn't have to be precise. This is to give us an idea where to find for your observations on iNaturalist. A couple examples: "Hwy 27 north of Pikeville", "Hwy 11W between I-81junction and Hwy 394 junction", "Hwy 20 between Hohenwald and Summertown"

Were you prevented from surveying because of recent mowing or other management?

Unfortunately, we don't have the power to dictate how the regional TDOT offices manages their roadsides. That could mean that you arrive at an area you intended to survey and find that it was just mowed or sprayed.

- Yes
- No

If yes. Roughly how many miles were you not able to survey? _____

Also, let us know where this was, roughly: _____

e.g. "Hwy 70 between Sparta and Pleasant Hill"

Additional Comments:

If you have any comments or want us to know about anything else, include that in the space below.

Grassland Indicators

Viola pedata, bird-foot violet



Photo credit: www.southeasternflora.com



Phlox pilosa, downy phlox



Photo credit: www.missouriplants.com

Eryngium yuccifolium, rattlesnake-master



Photo credit: www.southeasternflora.com

Asclepias amplexicaulis, clasping milkweed

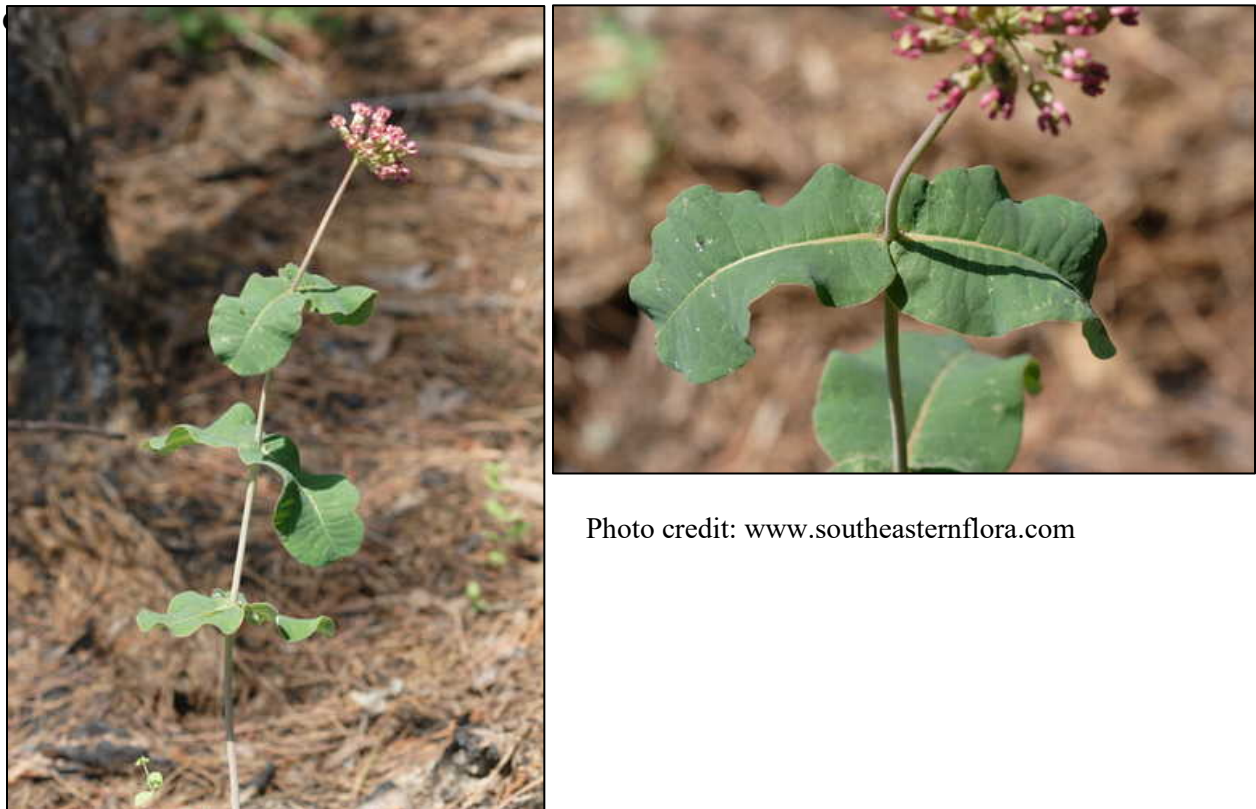


Photo credit: www.southeasternflora.com

**Lespedeza hirta*, hairy lespedeza



Photo credit: www.missouriplants.com

**Liatris squarrulosa*, Appalachian blazing star



Photo credit: www.missouriplants.com

*There are multiple species in this genus that are also good grassland indicators. Keep your eyes out for plants that resemble these.

Tephrosia virginiana, goat's rue



Photo credit: www.missouriplants.com

Parthenium integrifolium, wild quinine



Photo credit: www.missouriplants.com

**Helianthus mollis*, ashy sunflower



Photo credit: www.southeasternflora.com

Lobelia puberula, downy lobelia



Photo credit: www.missouriplants.com

*There are multiple species in this genus that are also good grassland indicators. Keep your eyes out for plants that resemble these.

Monarda fistulosa, mintleaf beebalm



Photo credit: www.missouriplants.com

Oenothera fruticosa, narrowleaf evening primrose



Photo credit: www.southeasternflora.com

Pycnanthemum tenuifolium, slender mountain mint



Photo credit: www.missouriplants.com

Coreopsis tripteris, tall tickseed



Photo credit: www.missouriplants.com

Rosa carolina, Carolina rose



Photo credit: www.missouriplants.com

Malus angustifolia, wild crab apple



Photo credit: www.missouriplants.com

Crataegus crus-galli, cock spur hawthorn



Photo credit: <http://www.illinoiswildflowers.info>

Quercus marilandica, blackjack oak



Photo credit: www.southeasternflora.com

Andropogon gerardii, big bluestem



Photo credit: www.inaturalist.org, user: rob21



Photo credit: www.missouriplants.com

Andropogon ternarius, splitbeard bluestem



Photo credit: www.southeasternflora.com

Sorghastrum nutans, indian grass



Photo credit: <http://www.salicicola.com>



Elymus glabriflorus, southeastern wildrye



Photo credit: <http://www.illinoiswildflowers.info>



Photo credit: D. Estes