Coyne Prairie, Dade Co MO

Plain-Bellied Watersnake
Barton Co MO

Ornate Box Turtle
Henry Co MO

Crawfish Frog
Dade Co MO

MISSOURI PRAIRIE FOUNDATION®

Protecting Native Grasslands

www.moprairie.org

Grassland Amphibians and Reptiles in Missouri

Missouri Prairie Foundation

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What is a prairie?

This is not an easy question to answer!

For the purposes of this talk, prairies are native, original, unplowed grasslands with a diversity of plants and animals historically found in western and northern Missouri but also southeastern Missouri.

Most biologists will also consider important habitats in the Ozarks as grasslands, such as glades, fens, and savannas. They're not wrong but those habitats are specialized and need their own talk.

Coyne Prairie, Dade Co MO

Not Prairies

Mingo National Wildlife Refuge, Stoddard Co MO

Jacks Fork River, Shannon Co MO

Three Creeks Conservation Area, Boone Co MO

Boone Forest,
Warren Co MO

Ozark Grasslands

Hughes Mountain, Washington Co MO

Lodge Glade, HaHaTonka State Park, Camden Co MO

Gladetop Trail, Taney Co MO

Indian Trail Conservation Area, Dent Co MO

Grasshopper Hollow, Reynolds Co MO

Prairies

La Petite Gemme Prairie, Polk Co MO

Sand Prairie Conservation Area, Scott Co MO

Linden’s Prairie, Lawrence Co MO

Stark Family Prairie, Hickory Co MO

Pastures and Cultivated Fields

Fescue Pasture, Dade Co MO

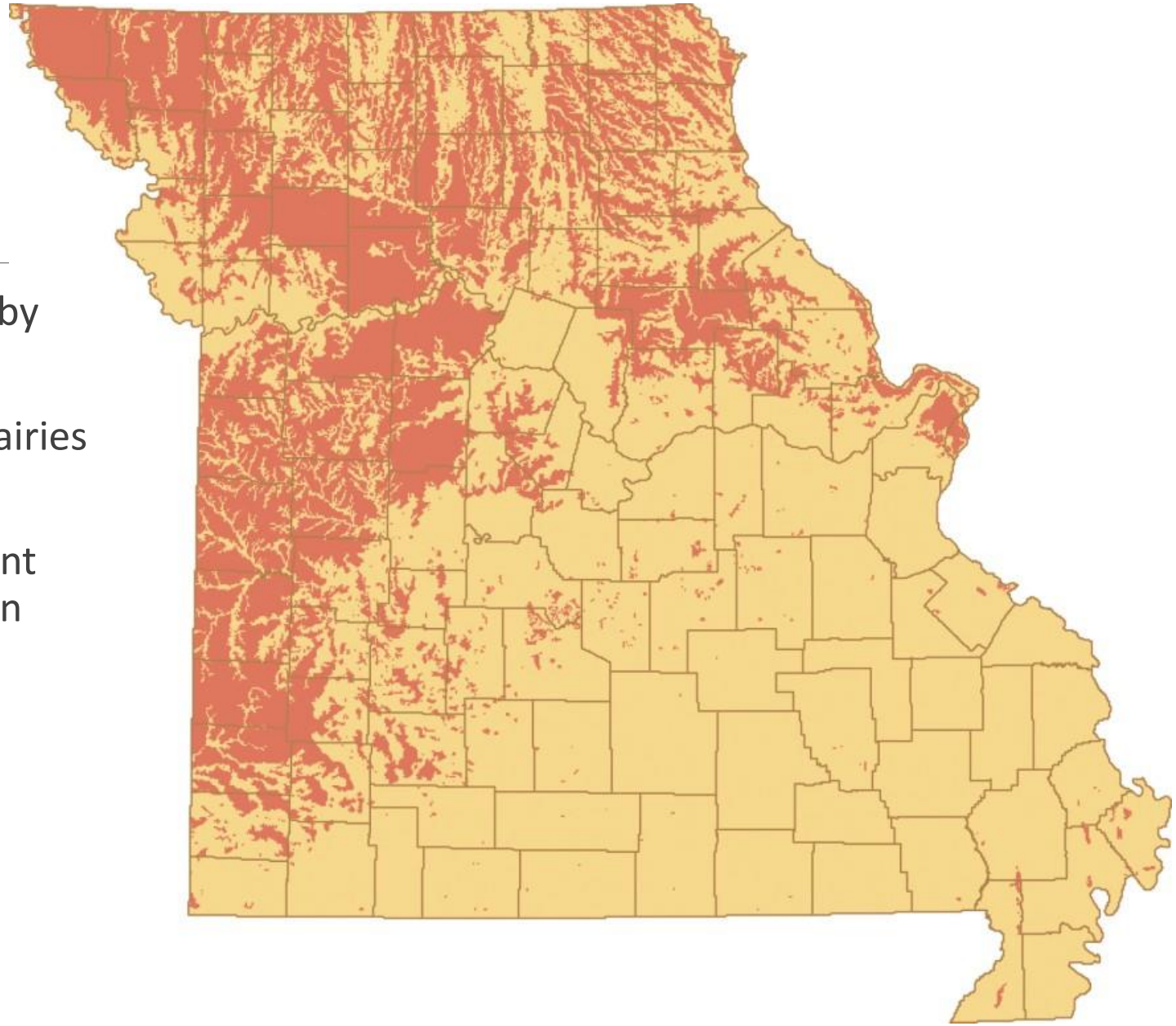
Cultivated Field, Dade Co MO

Pre-Settlement Prairie

Pre-settlement prairie map created by Walter Schroeder.

This is a *conservative* estimate of prairies in Missouri in the early 1800s.

Note that “prairies” are mostly absent from the Ozarks but show up again in southeast Missouri.



Missouri Ecoregions

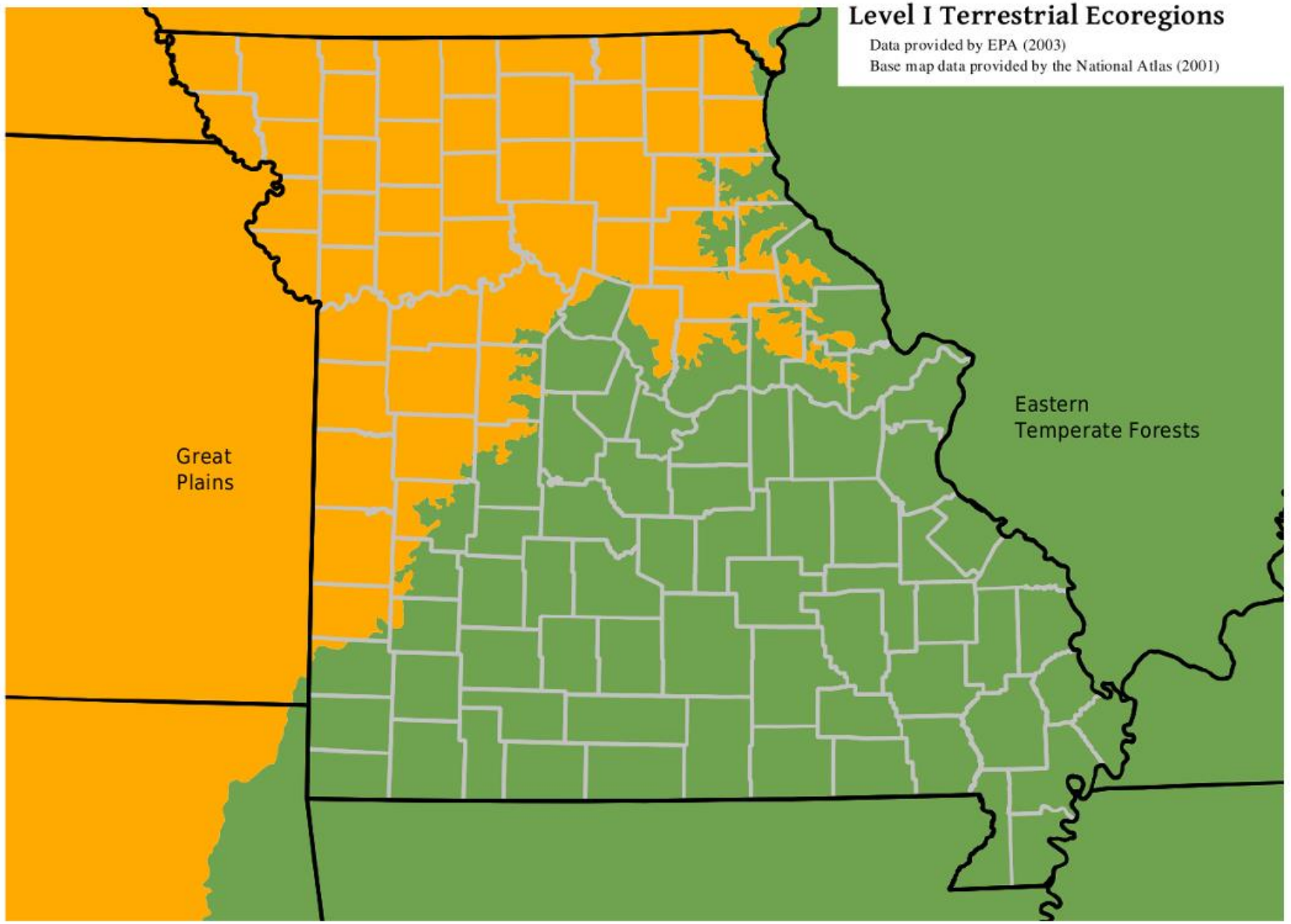
Level I Ecoregions in Missouri.

There are 15 broad ecoregions in North America.

The Eastern Temperate Forests stretch to the Atlantic.

The Great Plains stretch to the Rocky Mountains.

See more at https://atlas.moherp.org/missouri/.



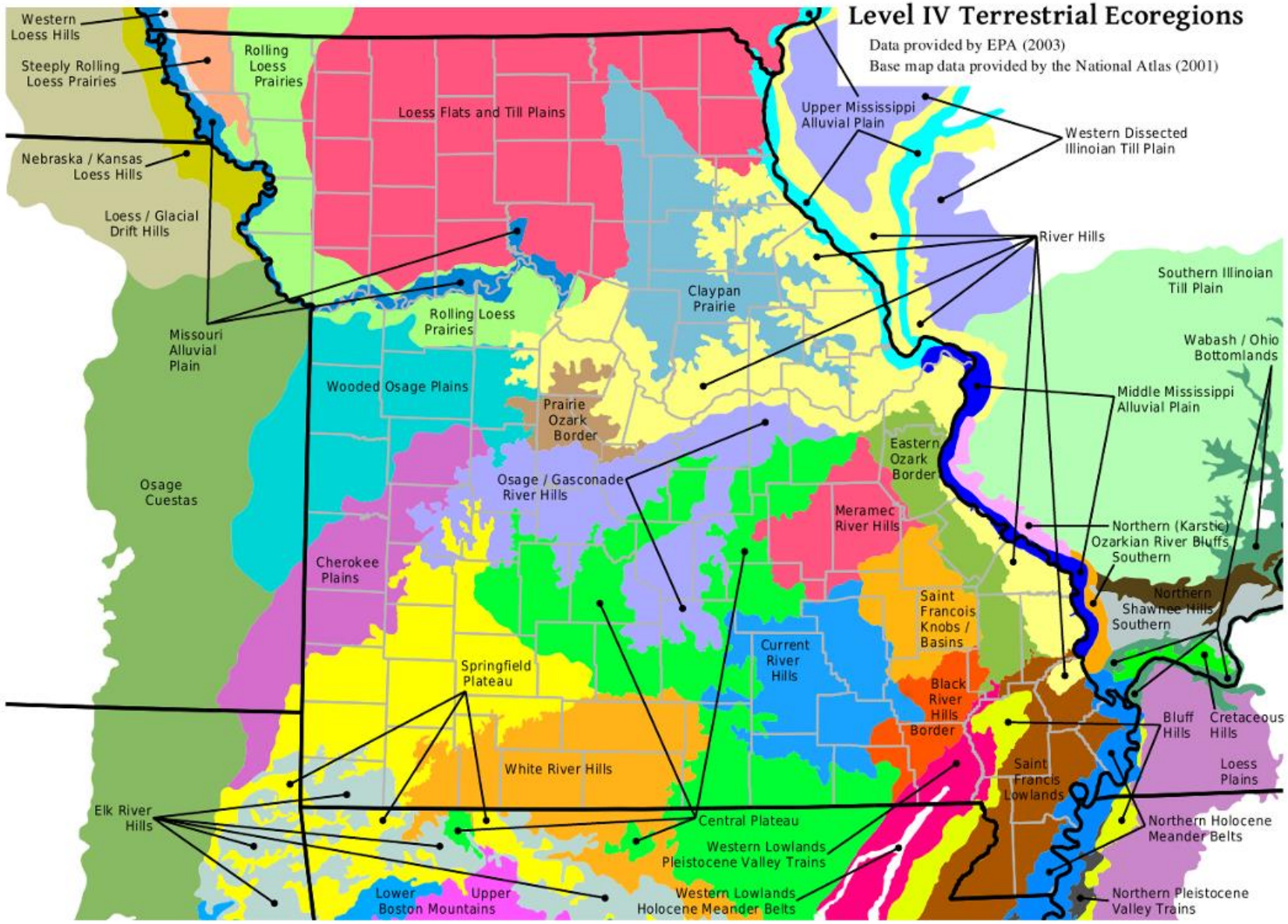
Missouri Ecoregions

Level IV Ecoregions in Missouri.

There are 28 Level IV Ecoregions that can be found in Missouri.

Note the Springfield Plateau, technically part of the Ozarks but containing several public prairies.

See more at https://atlas.moherp.org/missouri/.



What are Amphibians and Reptiles?

Amphibians include frogs, toads, salamanders, and newts.

Reptiles include lizards, snakes, and turtles.

These groups are very different from each other and not particularly closely related but they've been grouped together traditionally.

"Herps" is an informal word that groups together amphibians and reptiles into something short and easy to say.

Most amphibians and reptiles in Missouri are habitat generalists. That means that they can be found in a lot of different habitats, including prairies.

Ornate Box Turtle, Henry Co MO

Amphibians

Most Missouri amphibians (and all that can be considered prairie species) mate and lay their eggs in water. A tadpole hatches and grows in the water until it transforms to a terrestrial juvenile.

Amphibians do not have scales or claws and their skin is typically moist.

Because of these limitations, they are often secretive, living underground and / or near water sources, venturing out at night or during the rain.

Frogs and toads are by far the easiest “herps” to observe on prairies due to their breeding choruses.

Crawfish Frog, Dade Co MO

Reptiles

Reptiles are hardier than amphibians, often not requiring a connection to water at all, and are usually seen out during the day.

Reptiles typically have scales and dry skin. They have claws (except snakes, of course!).

Reptiles are ectothermic, which simply means they do not have a way to internally regulate their body temperature. Often, they bask to warm up.

All lizards and turtles in Missouri lay eggs in a nest on land. About half of Missouri snakes also lay eggs. The other half give birth to live young.

Plain-Bellied Watersnake, Barton Co MO

Problem with Common Names

Some other species of herps have common name modifiers such as “Plains” or “Great Plains” or “Prairie” but these can be misleading.

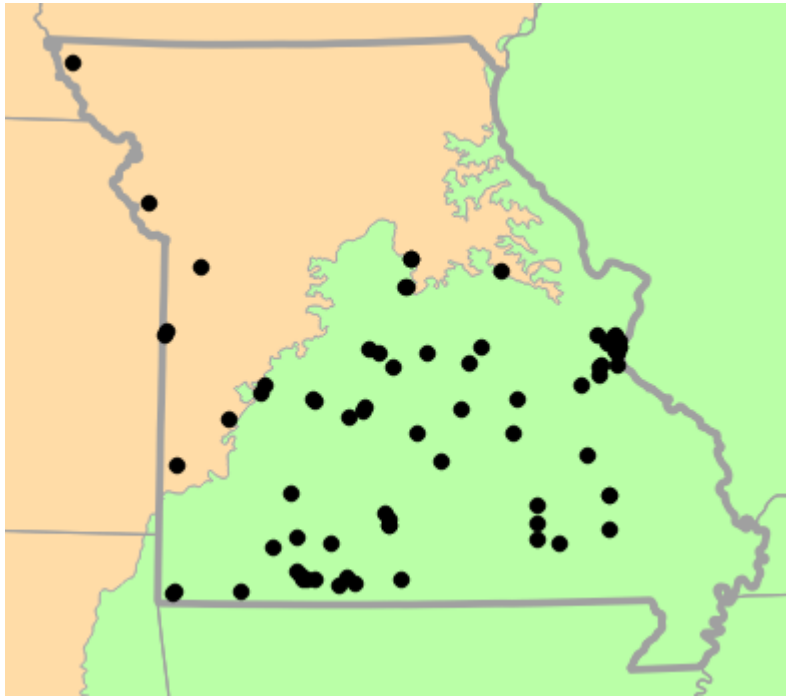
Many of these species are certainly associated with grasslands and prairies in states to our west but they often do not have many populations in Missouri so they aren’t really considered an important part of our prairie fauna.

“Western” is also a modifier that is used for a lot of our common names. But remember that we are west compared to the places where many of these animals were first encountered during settlement along the east coast.

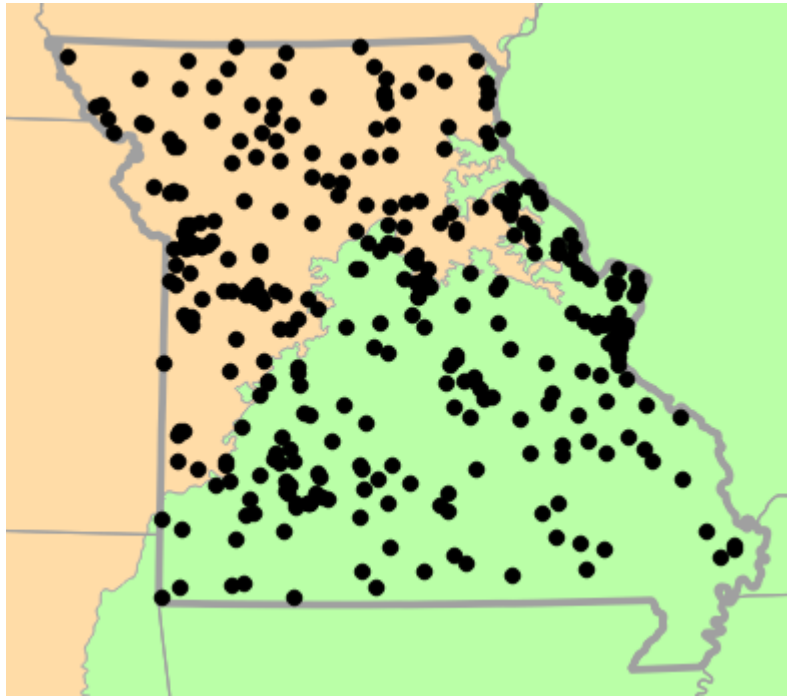
- Plains Spadefoot Toad
- Great Plains Toad
- Plains Leopard Frog
- Prairie Lizard
- Great Plains Skink
- Plains Hog-nosed Snake
- Prairie Kingsnake
- Great Plains Ratsnake

Prairie Species Misnomers

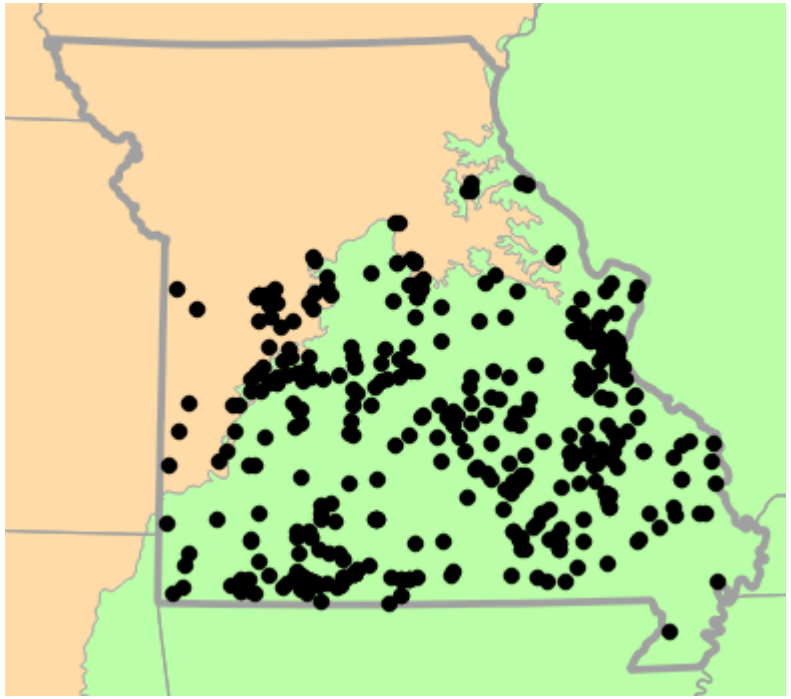
The names Great Plains Ratsnake, Prairie Kingsnake, and Prairie Lizard are misleading because these species aren't particularly associated with prairies in Missouri. All three are more common in the Ozarks than our western or northern prairie regions.



Great Plains Ratsnake Localities, Level I Ecoregions



Prairie Kingsnake Localities, Level I Ecoregions



Prairie Lizard Localities, Level I Ecoregions

Common Grassland Species

Salamanders: Small-mouthed Salamander

Frogs: American Toad, Boreal Chorus Frog, Spring Peeper, Blanchard's Cricket Frog, Southern Leopard Frog, Plains Leopard Frog, Bullfrog

Lizards: Western Slender Glass Lizard

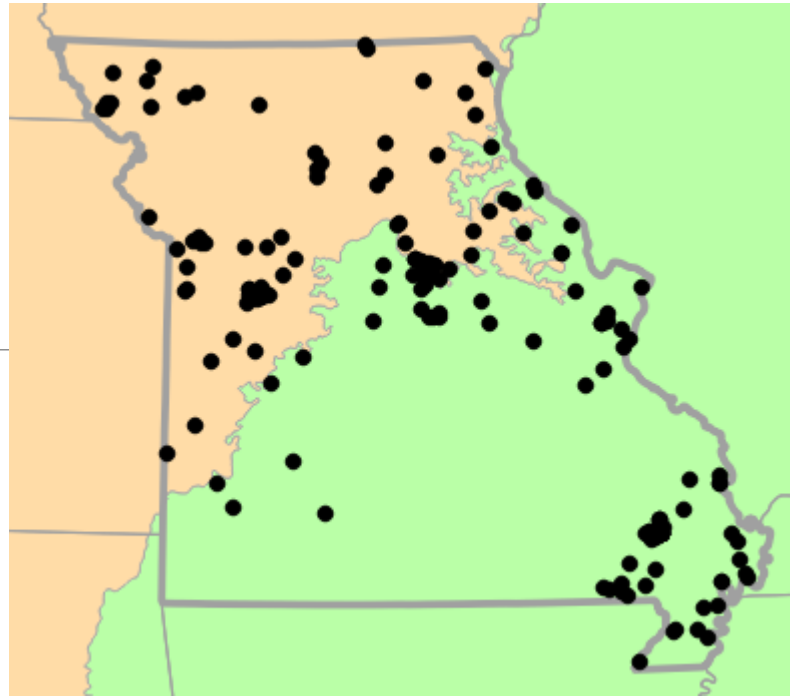
Snakes: Western Ratsnake, Prairie Kingsnake, Speckled Kingsnake, Northern Rough Greensnake, Northern American Racer, Plain-bellied Watersnake, Graham's Crawfish Snake, Common Gartersnake, Orange-striped Ribbonsnake

Turtles: Snapping Turtle, Western Painted Turtle, Red-eared Slider, Three-toed Box Turtle, Ornate Box Turtle

Small-mouthed Salamander

Small-mouthed Salamanders are difficult to detect in grassland habitats because they spend most of their lives underground in mammal and crayfish burrows, breeding in February.

Like many of our grassland species, their distribution reflects an aversion to the Ozarks more than a particular affinity to grasslands.



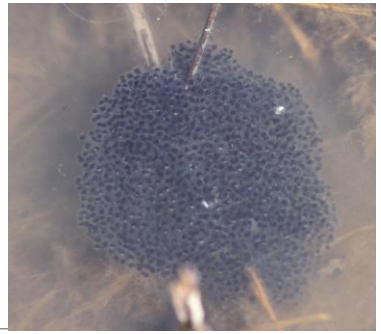
Small-mouthed Salamander Localities, Level I Ecoregion

Small-mouthed Salamander, Saint Louis Co MO, (Peter Paplanus photo, cropped, Creative Commons Attribution 2.0 Generic)

Small-mouthed Salamander, Lincoln Co MO (Bruce Schuette photo)

Small-mouthed Salamander, Pike Co MO

Southern Leopard Frog egg mass, Pike Co MO



Common Grassland Frogs and Toads

Spring Peeper, Cape Girardeau Co MO (audio)

American Toad, Grundy Co MO

Blanchard's Cricket Frog, Taney Co MO (audio)

Southern Leopard Frog, Wayne Co MO (audio)

American Toad, Greene Co MO (video)

American Toad egg tangle, Madison Co MO

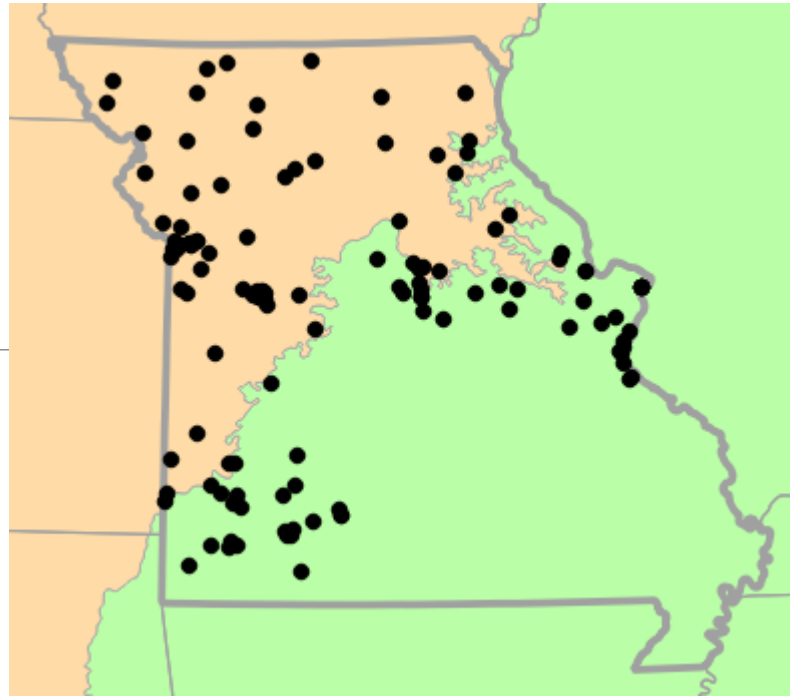
Bullfrog, Greene Co MO

Boreal Chorus Frog

Boreal Chorus Frogs (formerly known as Upland Chorus Frogs) can be found in grassy pools throughout northern and western Missouri. Related species are elsewhere in Missouri. Listen for them in February and March anywhere except most of the Ozarks.

Boreal Chorus Frog, Dade Co MO (audio)

Amphibian Pond, MPF Prairie



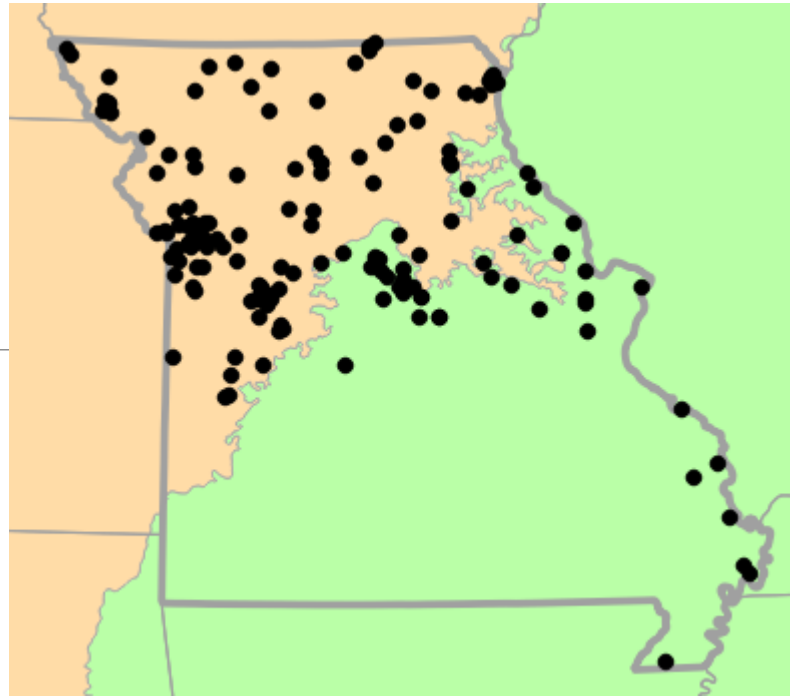
Boreal Chorus Frog Localities, Level I Ecoregions

Boreal Chorus Frog, Barton Co MO (video)

Plains Leopard Frog

Plains Leopard Frogs are found mainly in the northern part of Missouri but also along the Mississippi River to southern Missouri.

Listen for them in spring and summer. It's possible they have benefitted from the conversion of former forested bottomlands to cultivated fields.



Plains Leopard Frog Localities, Level I Ecoregions

Plains Leopard Frog, Clarke Co IA

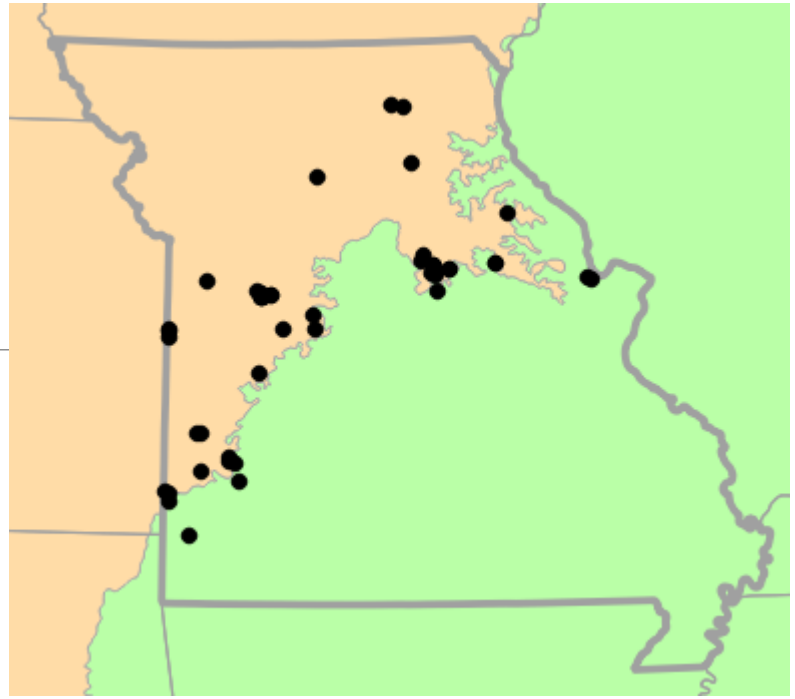
Plains Leopard Frog, Pike Co MO

Plains Leopard Frog, Putnam Co MO

Northern Crawfish Frog

Northern Crawfish Frogs can be found in scattered localities in western and northern Missouri. They depend on high-quality prairie habitats with robust crayfish populations.

These frogs have a brief breeding period, usually in early March, and are easily recognized by their loud, snoring calls.



Northern Crawfish Frog Localities, Level I Ecoregions

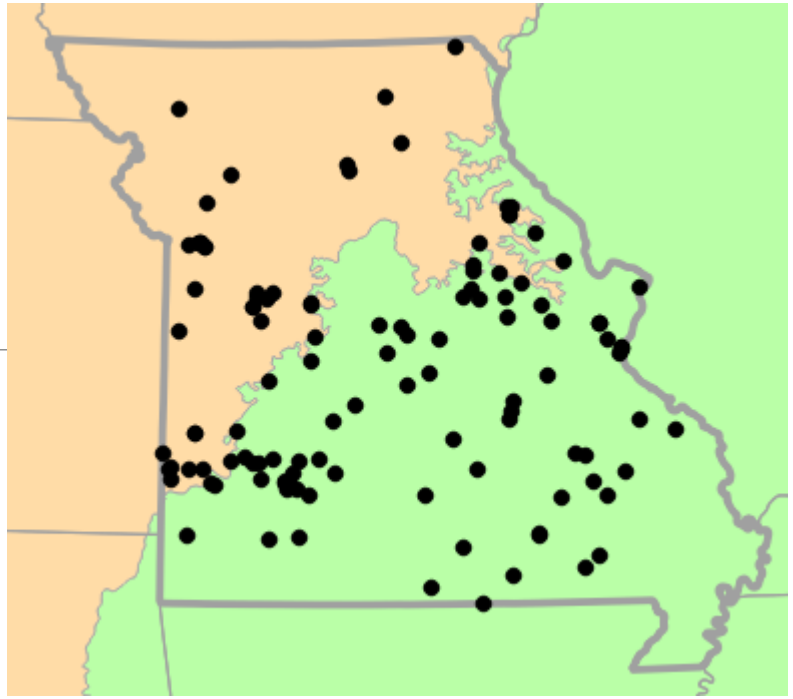
Northern Crawfish Frog, Dade Co MO (audio)

Northern Crawfish Frog, Saint Clair Co MO (Bruce Schuette photo)

Northern Crawfish Frog egg mass, Dade Co MO

Western Slender Glass Lizard

Western Slender Glass Lizards are legless lizards found in open, typically grassy, areas throughout most of the state.



Western Slender Glass Lizard Localities, Level I Ecoregions

Western Slender Glass Lizard, Greene Co MO

Western Slender Glass Lizard, Barton Co MO

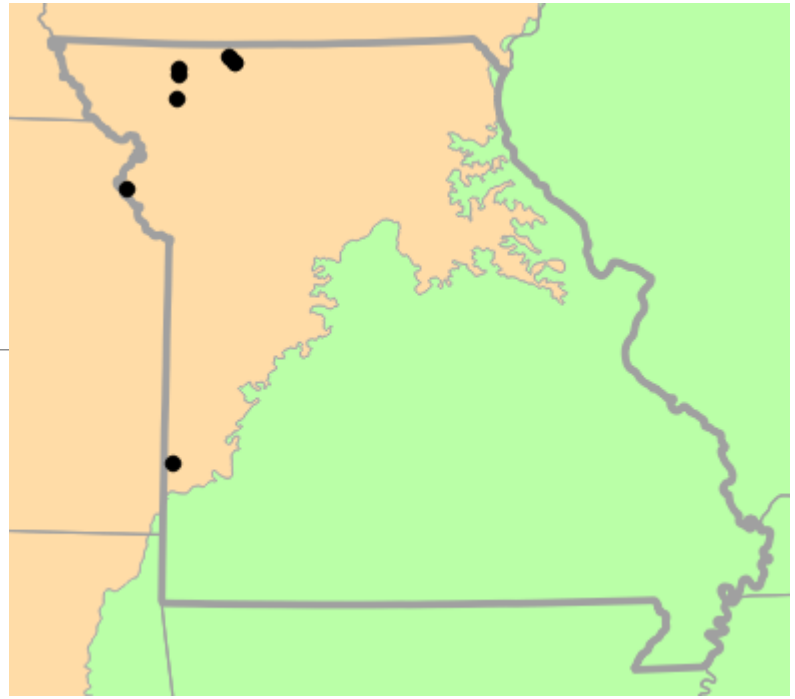
Prairie Skink

Prairie Skinks are found in scattered grassland habitats in northwest Missouri and at a single site in southwest Missouri.

These two populations represent different subspecies that actually look quite different.

Northern Prairie Skink (MDC Staff photo)

Southern Prairie Skink (MDC Staff photo)



Prairie Skink Localities, Level I Ecoregions

Northern Prairie Skink, Harrison Co MO

Common Grassland Snakes

Common Gartersnake, Perry Co MO

Orange-striped Ribbonsnake, Bates Co MO

Northern Rough Greensnake, Bates Co MO

Western Ratsnake, Henry Co MO

Plain-bellied Watersnake, Cass Co MO

North American Racer, Greene Co MO

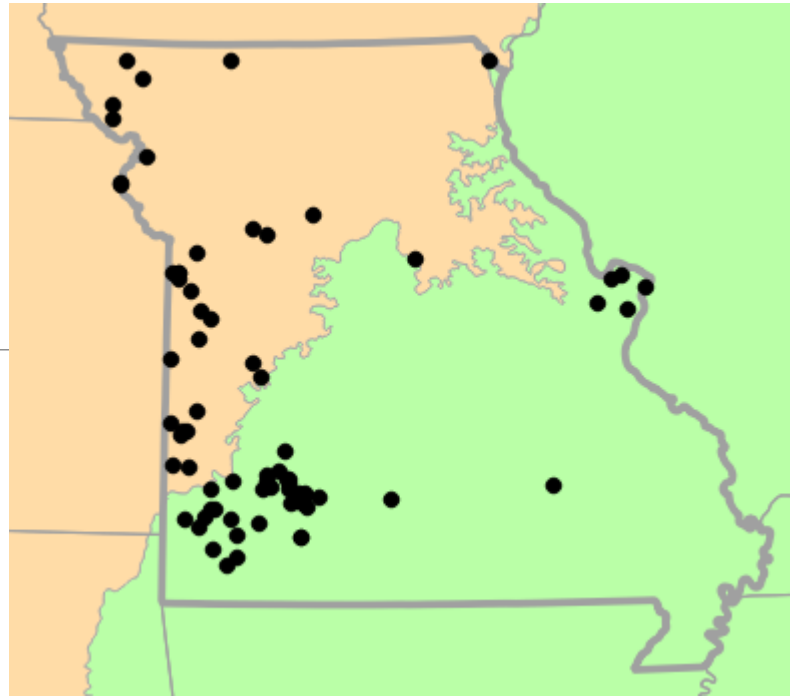
Prairie Kingsnake, Morgan Co MO

Speckled Kingsnake, Washington Co MO

Bullsnake

Bullsnakes are found in historical prairie landscapes and persist in these areas even after conversion to agricultural uses.

Bullsnake, Newton Co MO
(Bruce Schuette photo)



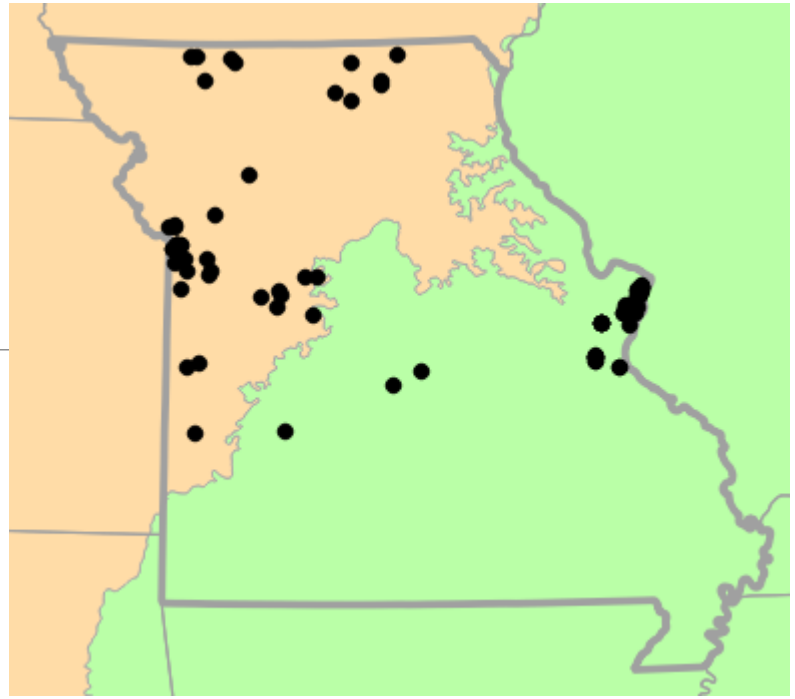
Bullsnake Localities, Level I Ecoregions

Bullsnake, Chase Co KS

Lined Snake

Lined Snakes are scattered in prairie areas in northern Missouri and in scattered locations in the Ozarks. They are infrequently encountered in prairie areas and are probably more common than indicated on this map.

Lined Snake, Jefferson Co MO (Peter Paplanus photo, cropped, Creative Commons Attribution 2.0 Generic)

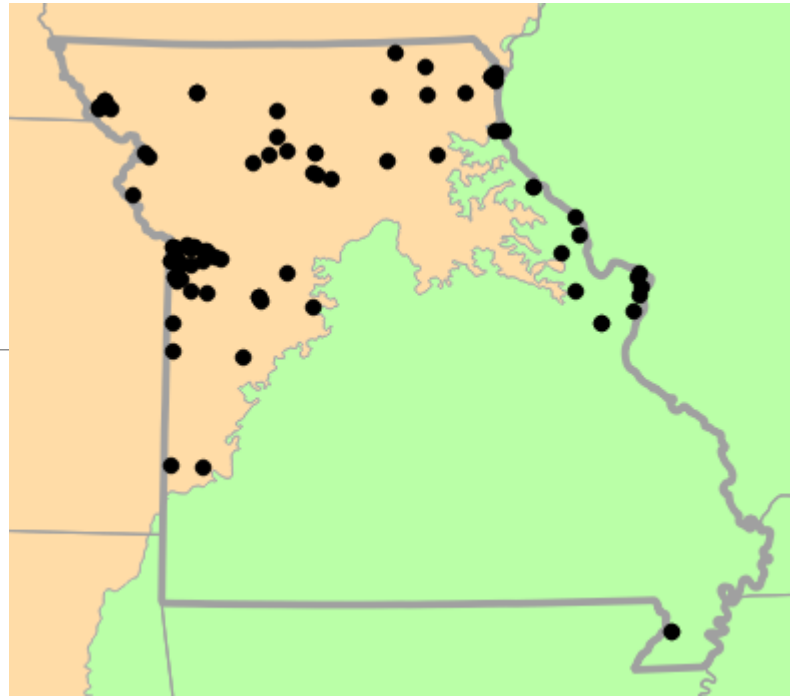


Lined Snake Localities, Level I Ecoregions

Lined Snake, Jefferson Co MO

Graham’s Crawfish Snake

Graham’s Crawfish Snakes are highly specialized predators of crawfish and are restricted to habitats with good crawfish populations. They tend to be found in wet prairies and can be very common in the right habitat.



Graham’s Crawfish Snake Localities, Level I Ecoregions

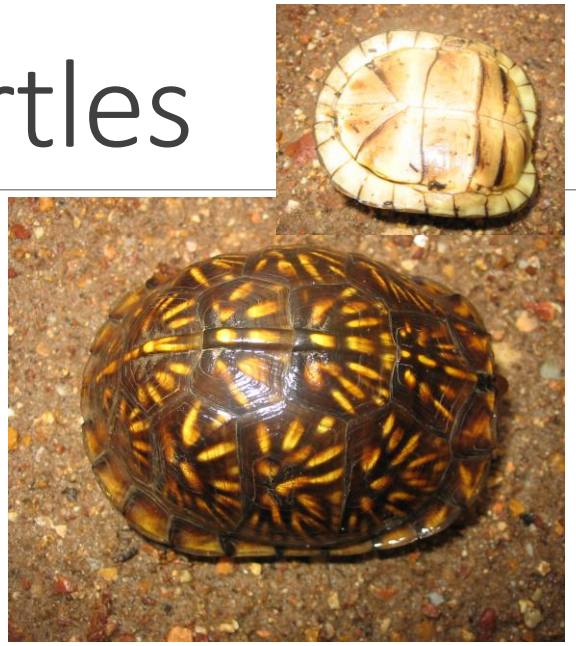
Graham’s Crawfish Snake, Saint Clair Co IL (Peter Paplanus photo, cropped, Creative Commons Attribution 2.0 Generic)

Graham’s Crawfish Snake, Lincoln Co MO (Bruce Schuette photo)

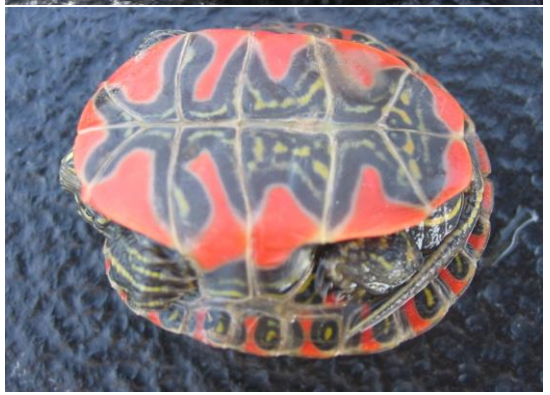
Common Grassland Turtles

Three-toed Box Turtle, Polk Co MO

Three-toed Box Turtle, Polk Co MO



Three-toed Box Turtle, Shannon Co MO



Western Painted Turtle, Barton Co MO

Snapping Turtle, Pike Co MO

Snapping Turtle, Greene Co MO

Red-eared Slider, Oregon Co MO

Ornate Box Turtle

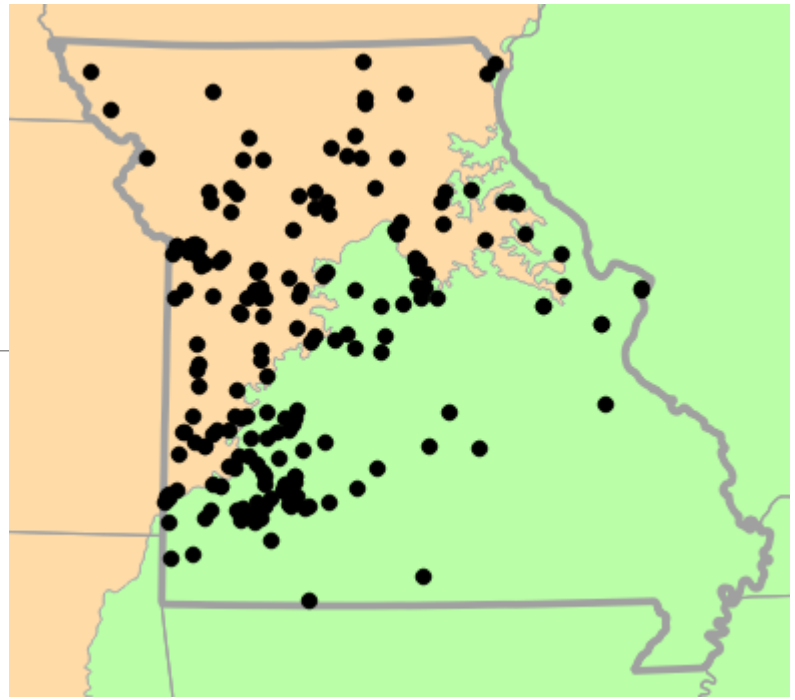
Ornate Box Turtles are found in former prairie areas and persist in areas where grasslands, even degraded ones, remain. Watch for them crossing roads in May and June.

Ornate Box Turtle, Hickory Co MO

Ornate Box Turtle, Cedar Co MO

Ornate Box Turtle, Lawrence Co MO

Ornate Box Turtle, Dade Co MO



Ornate Box Turtle Localities, Level I Ecoregions

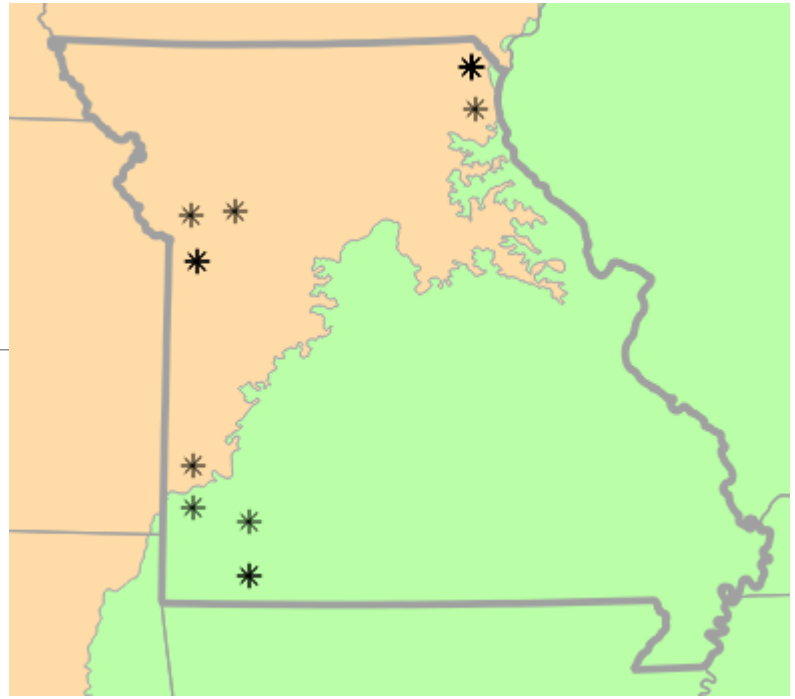
Ornate Box Turtle, Vernon Co MO

Yellow Mud Turtle

Yellow Mud Turtles were historically found in three areas of the state: northeast Missouri, southwest Missouri, and the Kansas City region. It's unknown how these populations are faring and it's possible other populations will be discovered.

In plains states to our west, these turtles are associated with prairie ponds and wetlands.

Yellow Mud Turtle, Barry Co MO (Jeff Briggler photo)



Yellow Mud Turtle Counties, Level I Ecoregions

Yellow Mud Turtle (MDC staff photo)

Obligate Prairie Species

A species is considered “obligate” to a habitat if it cannot survive outside of that habitat.

Very few of our herps are obligate species. Most can be found in other habitats (“generalists”) or persist in former grassland areas that have been fractured by human-caused disturbance.

Bullsnake and Ornate Box Turtle are both undeniable grassland species that have survived the destruction of our original prairies and have figured out a way to make a living in our human landscape.

The Crawfish Frog is an obligate prairie species, found only in intact prairies.

Because our prairies are nearly gone, prairie obligate species are extirpated, rare, or uncommon in Missouri and in need of protection.

This underscores the importance of protecting the few remaining intact prairies, which is the mission of the Missouri Prairie Foundation.

Northern Missouri Prairie Species

Smooth Greensnake (likely extirpated), Plains Gartersnake, Eastern / Prairie Massasaugas (endangered) are historically known from primarily wet prairies in northern Missouri. These habitats were almost completely converted to agricultural use by the mid-1900s, resulting in a loss of most populations of these species and other prairie obligates (like crawfish frogs).

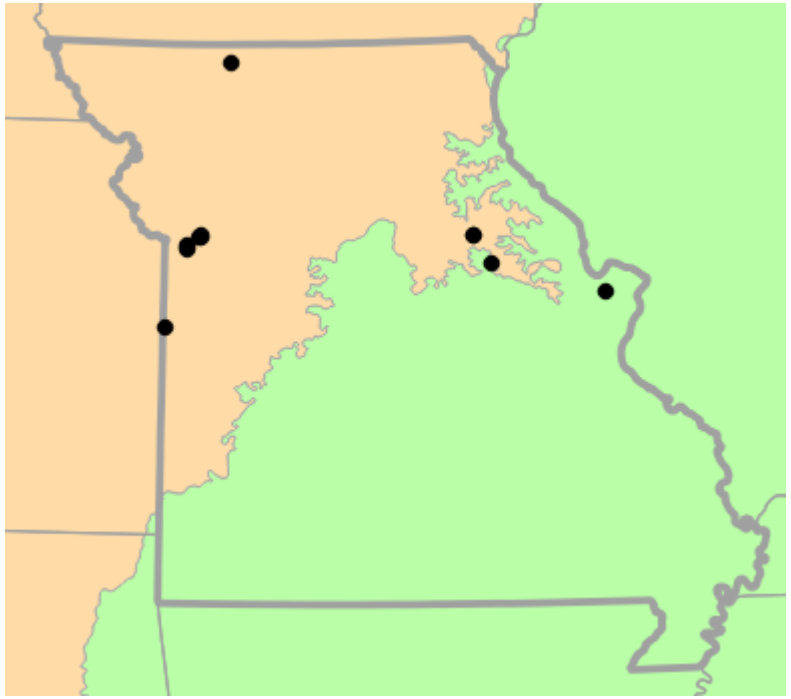
Smooth Greensnake, Cook Co IL
(Peter Paplanus photo, unaltered,
Creative Commons Attribution 2.0 Generic)

Plains Gartersnake, Cook Co IL
(Peter Paplanus photo)

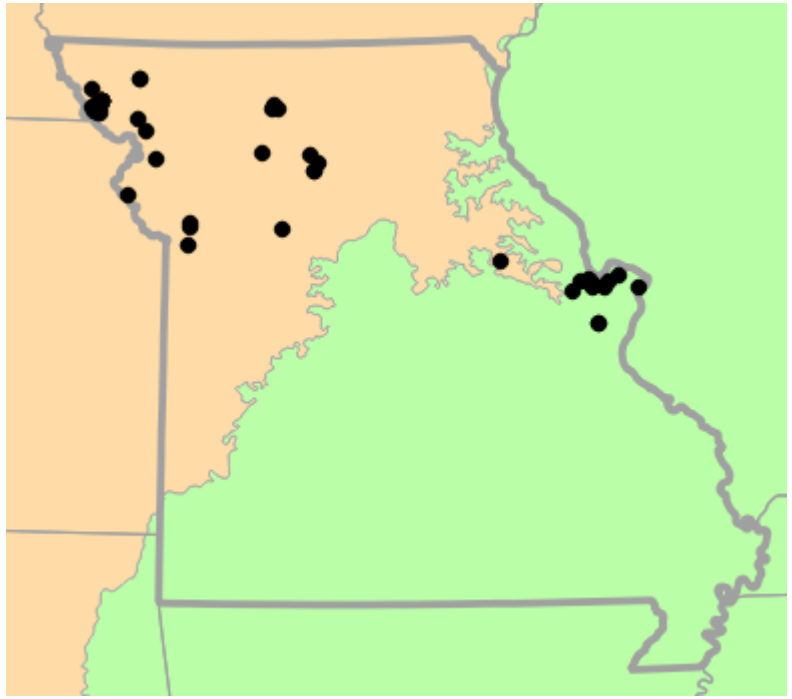
Prairie Massasauga, Linn Co MO
(Peter Paplanus photo)

Northern Missouri Prairie Species

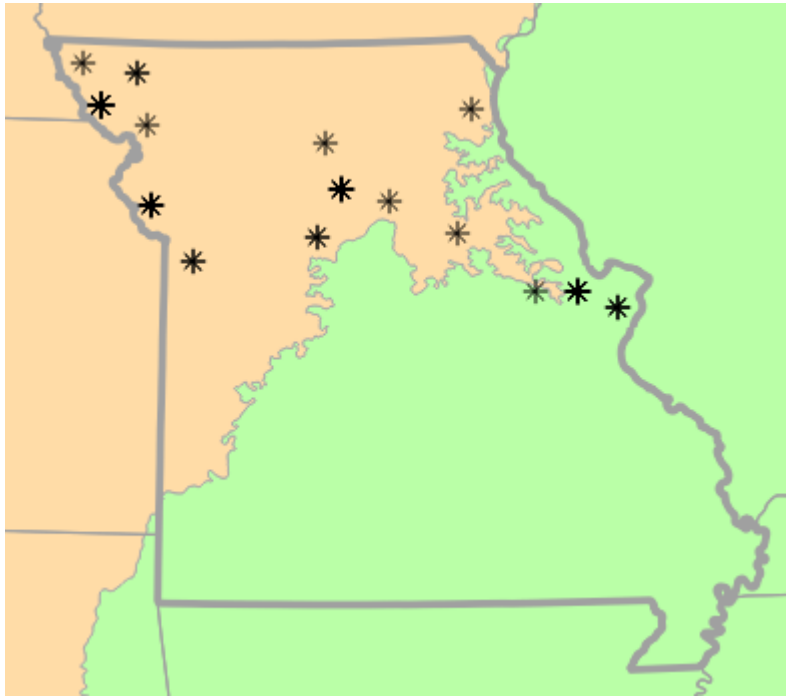
Smooth Greensnake, Plains Gartersnake, Eastern / Prairie Massasaugas have several known historical localities but many of these are extirpated. Plains Gartersnakes are from several extant populations and are probably more widespread in northern Missouri than indicated.



Smooth Greensnake Localities, Level I Ecoregions



Plains Gartersnake Localities, Level I Ecoregions



Massasauga Counties, Level I Ecoregions

Southeast Missouri Sand Prairie Species

The Eastern Spadefoot (Toad), Illinois Chorus Frog, and Dusty Hog-nosed Snake rely on loose, sandy soil. Eastern Spadefoots and Illinois Chorus Frogs can persist in cultivated areas with minimal natural cover but intact sand prairies are needed to sustain their populations.

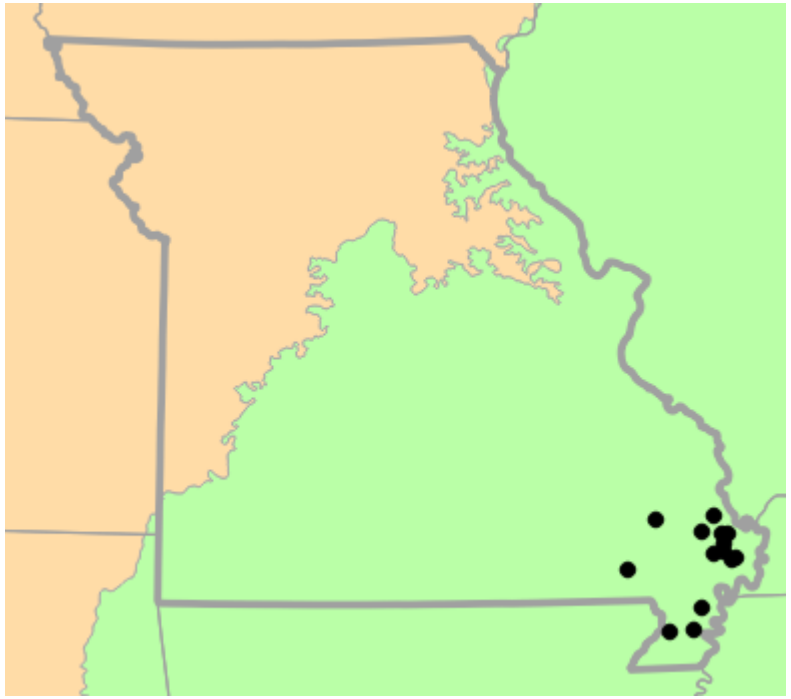
Eastern Spadefoot, Scott Co MO
(Peter Paplanus photo, unaltered,
Creative Commons Attribution 2.0 Generic)

Illinois Chorus Frog, Scott Co MO
(Peter Paplanus photo, unaltered,
Creative Commons Attribution 2.0 Generic)

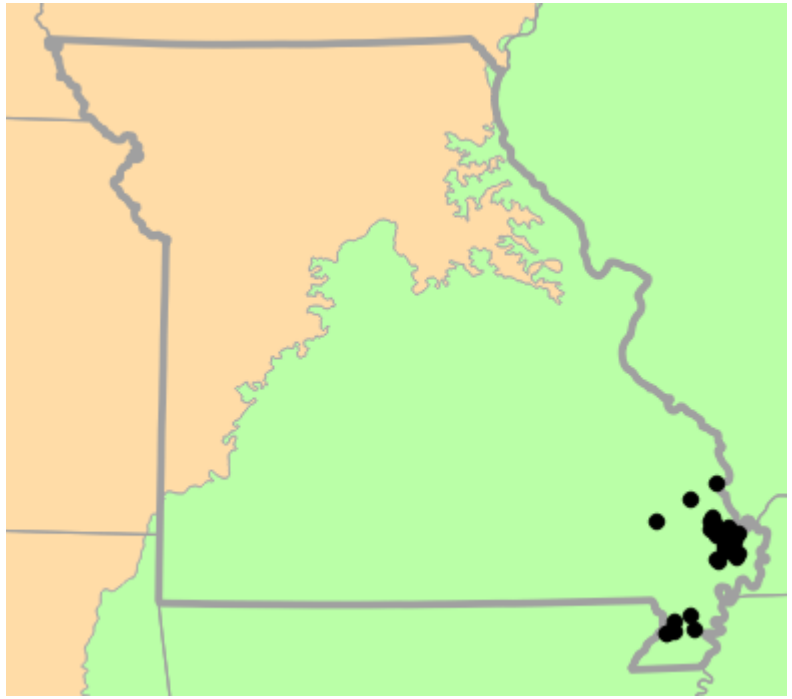
Dusty Hog-nosed Snake, Scott Co MO
(Peter Paplanus photo, unaltered,
Creative Commons Attribution 2.0 Generic)

Southeast Missouri Sand Prairie Species

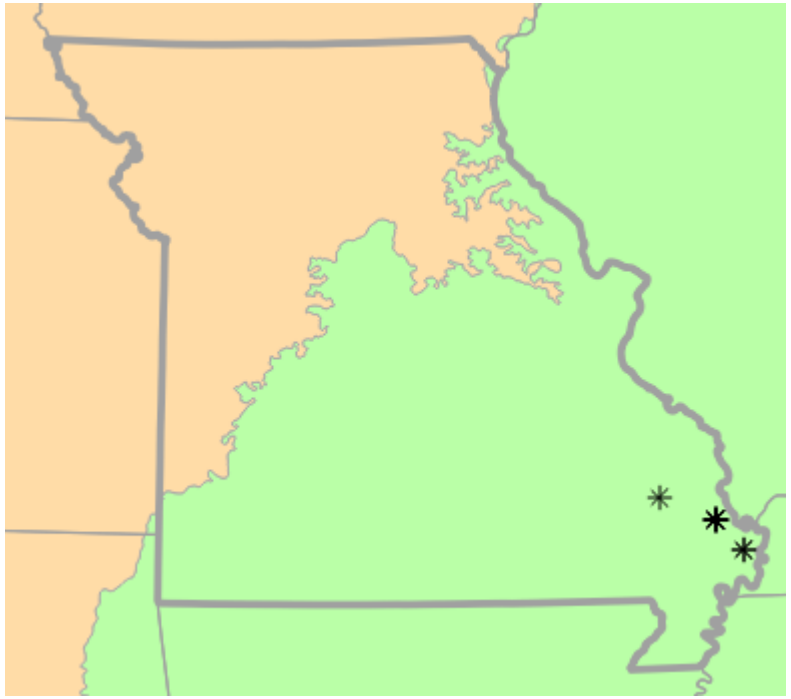
The Eastern Spadefoot (Toad), Illinois Chorus Frog, and Dusty Hog-nosed Snake are found only in the rare sand prairies of southeast Missouri.



Eastern Spadefoot Localities, Level I Ecoregions



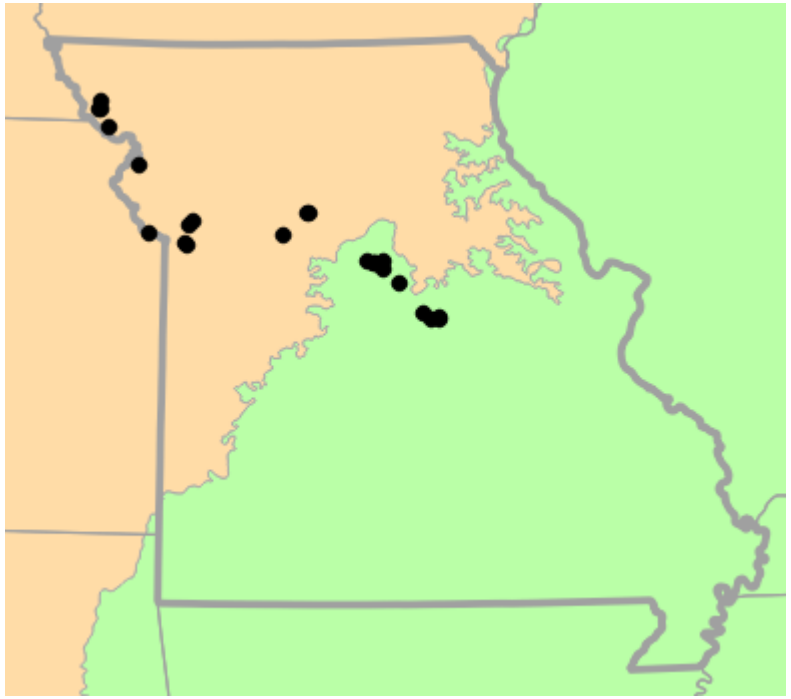
Illinois Chorus Frog Localities, Level I Ecoregions



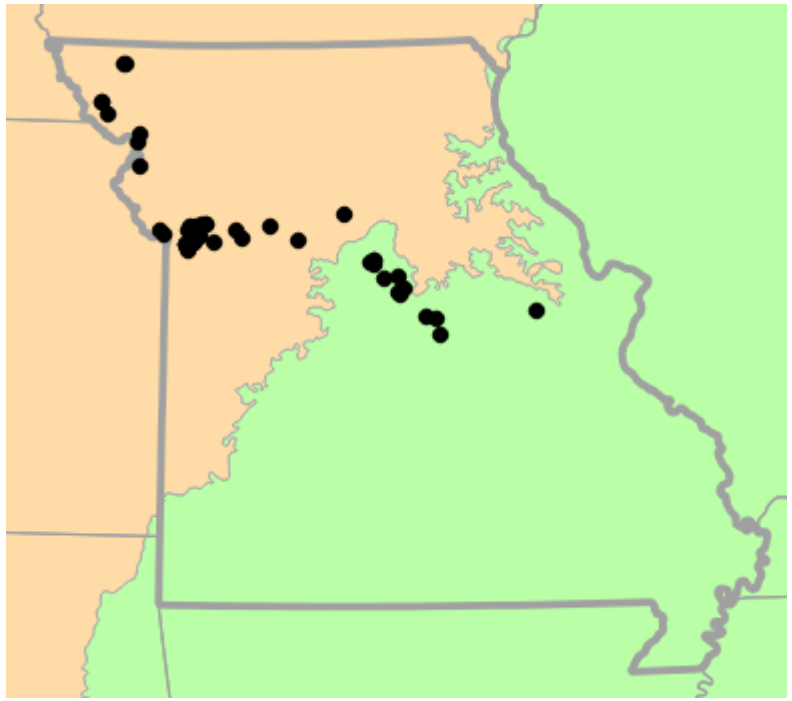
Dusty Hog-nosed Snake Counties, Level I Ecoregions

Plains Frogs and Toads

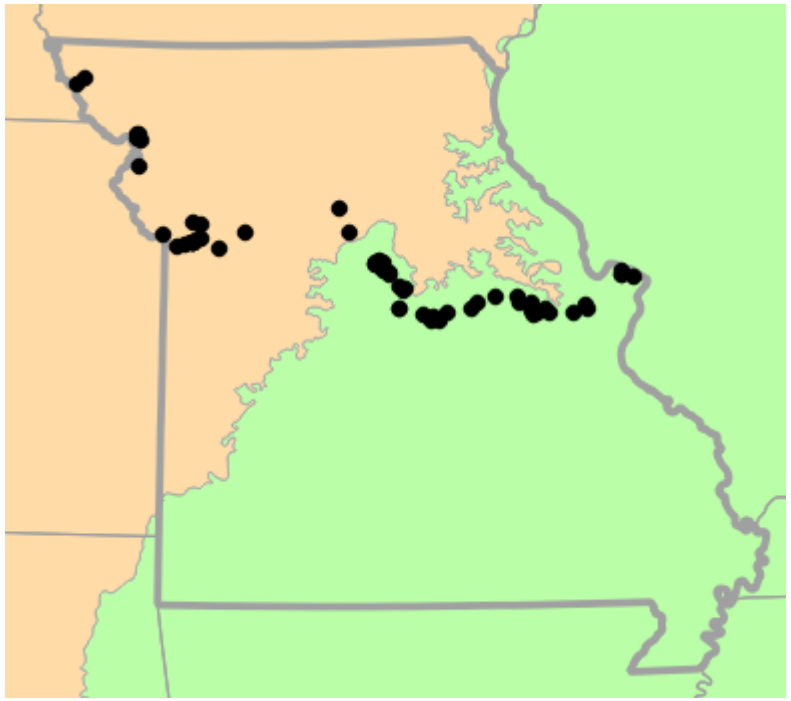
Great Plains Toad, Woodhouse's Toad, Plains Spadefoot (Toad) are all western species that are known from northwestern Missouri and along the Missouri River. It's likely these species washed down with large floods and found a suitable home in the cultivated fields along the river.



Great Plains Toad Localities, Level I Ecoregions



Woodhouse's Toad Localities, Level I Ecoregions



Plains Spadefoot Localities, Level I Ecoregions

Finding Herps in Prairies

In many areas, rocks, logs, and even trash are used by herps to hide. This leaves a convenient way for people (“herpers”) to find amphibians and reptiles in these habitats.

Most prairies lack obvious cover like this and are a bit of a mystery. If you are lucky enough to see a snake or a lizard, it often disappears in the ample cover.

In some cases, cover boards can be placed, but we’re usually left just to get glimpses of what is there when we’re lucky.

Twenty-Five Mile Prairie, Polk Co MO

Early Spring on the Prairie

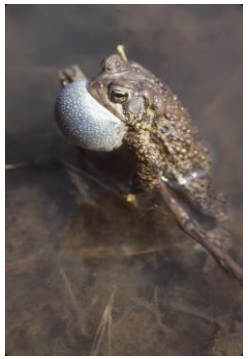
Two ways you can find herps early in the spring on a prairie:

Search burned landscapes on sunny days for activity, even as early as February or March.

Frogs and toads can be heard calling on prairies as early as February. These choruses can lead you to good habitat and more herps.

Boreal Chorus Frog, Dade Co MO

Spring Peeper, Greene Co MO



American Toad,
Pike Co MO

Golden Prairie, Barton Co MO

iNaturalist

While you're out on the prairie, watch for herps (or anything) and record your sightings in the mobile app called iNaturalist.

The science and management folks at the Missouri Prairie Foundation monitor these finds and can help you with identifications if you aren't sure what you found.

Go to the Android or Apple store or find the site at https://www.inaturalist.org/.

Pesticides

Pesticides are a general term that includes herbicides (kills plants), insecticides (kills insects and can harm other animals), and fungicides (kills fungus).

Most herps in Missouri are carnivores. Therefore, insecticides (kills insects) will affect them. In general for any grassland management, avoid insecticide use!

Use herbicides (kills plants) sparingly, or in contained spot-spraying applications, outside of the dormant season. Reptiles are fairly hardy, but amphibians can be adversely affected by herbicides.

Read the label and follow instructions. Some herbicide (including Round Up or glyphosate with surfactants) usage is prohibited near water.

Portable herbicide wagon, Greene Co MO

Controlled Burning

To protect herps, **burn only during the dormant season**.

In southern Missouri, that starts in mid- to late-November and ends in early-February, at the latest.

Add a week or two on either side of this as you get into northern Missouri.

Monitor local conditions. If you are still seeing active herps in November, don't burn. If you can hear frogs calling, the herps are active and it's too late.

Controlled Burn, Linden's Prairie, Lawrence Co MO

Mowing

Mowing will kill herps either from the blade itself or from crushing under vehicle tires.

If you're mowing just to knock down trees and shrubs, do it only during the dormant season (see controlled burning on previous slide).

If you must mow during the growing season (for hay or to keep a site looking manicured), mow when it's very hot. Many herps will be resting in shaded areas or burrows, but will have a chance to escape if approached.

If possible, allow areas of refuge near mowing activity and plan your mowing so animals have a chance to take refuge there.

Herp-killing machine, Greene Co MO

Grazing

Grazing animals typically won't harm herps but don't allow a herd to graze plants all the way down to the ground. This will remove habitat and cover.

Fence animals out of ponds and streams to allow herps there to thrive. Include a buffer between water and land for terrestrial activity, including nesting turtles.

Structural cover like brushpiles or areas with trees allow herps (and other animals) a place to take refuge. (But don't plant trees in a historically open prairie area just for this purpose!)

Cattle damage in spring branch, Greene Co MO

Herping Etiquette

State laws allow citizens of Missouri to keep native herps as pets but **removing animals from public land is against the law without a permit**! This includes MPF prairies.

All animals should be handled with care or, better yet, left alone and admired from a distance.

Be safe and smart! Do not handle venomous snakes. Also, amphibians have toxins that can cause skin irritation.

Always replace cover to the exact position you found it. Do not vandalize habitat while looking for herps.

Report your finds to legitimate authorities but do not share locations on social media or other public spaces.

Contact your local conservation agent if you see someone violating the law.

Summarized from Midwest PARC

- Know the laws
- Protect the animals
- Protect the habitat
- Protect yourself and others
- Be a good liaison between the herper community and the public

Southern Leopard Frog, Greene Co MO

Western Ratsnake, Barton Co MO

Questions?

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Missouri Prairie Foundation
https://moprairie.org/

Missouri Herpetological Atlas
https://atlas.moherp.org/

Missouri Herpetological Association
https://mha.moherp.org/

Submit A New Record
https://mha.moherp.org/submit-a-record/

Field Herpetology Etiquette
https://www.mwparc.org/products/etiquette/

Prairie Kingsnake, Lawrence Co MO