



A Spotlight on Silveus' Dropseed: Tracking a Rare Species and its Associated Communities in Big Thicket and Beyond

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Silveus' dropseed (*Sporobolus silveanus*) in the understory of the sodic wet flatwoods community in Lance Rosier unit, Big Thicket National Preserve. Image Credit NPS/GULN

Summary and Objectives

- The rare bunchgrass Silveus' dropseed has an affinity for unusual soils, frequent fires, and small, circular landforms called mima mounds. The species was first discovered in 1941 during a collection trip in the Big Thicket region, and although documented during the 2007 plant inventory for Big Thicket National Preserve, it had not been seen there since then. Recent surveys turned up one previously-known population and several newly discovered localities. These are primarily in a rare habitat type called sodic longleaf pine flatwoods.
- Outside of Big Thicket, the species is a key member of several other unusual types of prairies, glades and savannas that are found almost exclusively in eastern Texas and western Louisiana.
- This perennial grass likely belongs to a class of southeastern bunchgrasses that have fire-stimulated reproduction, which means on top of its overall rarity, the species is losing even more ground in fire-suppressed habitats.
- Learning how to tell Silveus' dropseed apart from lookalikes, understanding its habitat associations, and carefully mapping its distribution in Big Thicket will help the park protect this unique native grass and its surrounding rare plant communities.

Why is *Silveus'* Dropseed Important?

Silveus' dropseed (*Sporobolus silveanus*) is a narrow-leaved bunchgrass endemic to eastern Texas, southwestern Louisiana, southwestern Arkansas, and southern Oklahoma. Its range is so limited in Louisiana, Arkansas, and Oklahoma that in all three states it is considered critically imperiled (NatureServe 2025). The species is hard to find throughout most of its range in Texas as well, although it can be locally abundant in several types of prairies, glades, or savannas, each of which are themselves classified as rare ecological communities. Community-level rarity is defined here as having a NatureServe Global Conservation Status of imperiled or critically imperiled at the *plant association* level, which is a fine-scale classification that groups co-occurring plants within a defined habitat (Jennings et al. 2009; Master et al. 2012). Importantly, *Silveus'* dropseed is a dominant member of several rare associations in Texas and its surrounding states, and it is rarely found outside of them. As such, its presence can serve as an indicator that a site has high conservation value.

At least five plant associations are known to contain *Silveus'* dropseed in Texas: two are found in mesic prairies in the northeast, one is restricted to Catahoula sandstone barrens, one is in wet flatwoods near the westernmost extent of longleaf pine's (*Pinus palustris*) geographic range, and one is in the upper coastal prairie region. Each association is rare and narrowly distributed within east Texas, but collectively they span over 480 kilometers (300 miles) from the Oklahoma border south towards the coastline. While geographically disjunct, all five associations share two key ecological similarities: a dependence on fire and the presence of unusual soil or geomorphic features that create open clearings featuring a diversity of grasses, sedges, and wildflowers (for example, the Catahoula Barrens in Figure 1). Four of the five associations are linked to complex microtopography including patchy wet depressions next to small, circular, low-rising hills – known as mima mounds. Plant composition varies among associations, but several include other species that are known to be rare (Marietta and Nixon 1984; Rosen 2007). Documented localities include areas on public lands, such as Big Thicket National Preserve and Angelina National Forest, as well as private properties, including some owned by the Nature Conservancy. By managing lands for the success of *Silveus'* dropseed and its surrounding plants and animals, these organizations are protecting and maintaining some of the rarest plant communities in the southeastern U.S.

Silveus' dropseed and its associated communities face several immediate threats. Development pressures continue to spread throughout the region, and these are increasingly impacting the marginal, flood-prone, and non-arable lands where some populations of this species are likely to remain. The need for prescribed fire creates an additional challenge. Over decades of fire suppression in suitable habitats, *Silveus'* dropseed populations are in decline, and additional losses may continue to go unnoticed. In the northeastern corner of Big Thicket's Lance Rosier unit, for example, *Silveus'* dropseed was last recorded in bloom at the end of a decade with two prescribed fires (1990), but there were no confirmed observations there during the subsequent three decades. This changed in 2022-2025, when NPS staff from the Gulf Coast Inventory and Monitoring (I&M) Network and the Preserve's Natural Resources Management team re-found a few individuals from the populations recorded previously and discovered several new localities within the Preserve, including in areas that had been recently burned.



Figure 1. Black Branch Barrens in Angelina National Forest, Texas. The East Texas Catahoula Barrens plant community shown here is known to contain *Silveus'* dropseed and several other rare plant species. Image Credit Jane Carlson.

The purpose of this publication is to document the confirmed persistence and new records of *Silveus'* dropseed in Big Thicket National Preserve and to highlight the rare communities where the species is found. Additional context is provided in terms of its appearance, its co-occurring species, and how it is being managed for and protected elsewhere in Texas and Louisiana.

Identifying *Silveus'* Dropseed

Throughout its range, *Silveus'* dropseed can be difficult to distinguish from other bunchgrasses. If individuals are not flowering, they are easily overlooked and/or mistaken for better-known bunchgrasses such as gulf muhly (*Muhlenbergia capillaris*) or pineywoods dropseed (*Sporobolus junceus*). This aspect of 'hiding in plain sight' has likely led to its underrepresentation in herbarium collections (NatureServe 2025). Another challenge is that flowering in *Silveus'* dropseed may be fire-dependent. In fire-suppressed areas, there is evidence that most plants are remaining non-reproductive year-round, vastly increasing the difficulty of a positive identification. To help practitioners distinguish this species from lookalikes in the field, key differences in both vegetative and floral traits are described below.

Silveus' dropseed is one of only a handful of East Texas grasses that are clump-forming perennials with long, narrow, rigid leaves that arise from the base. Other lookalikes include two species of muhly, another dropseed species, and a cordgrass species, all of which can potentially occur within the Big Thicket region. While the complete list of southeastern bunchgrasses is much longer, including the well-known wiregrass species (*Aristida beyrichiana* or *Aristida stricta*), most of these species are absent from the Big Thicket region.

If the grass is in bloom, differences among species are apparent (Figure 2). The inflorescence of *Silveus'* dropseed is relatively large and diffuse, and the seeds plus outer coatings – also called the fruits – are relatively long and slender. These fruits look different from those of gulf muhly, because they lack muhly's wispy hair-like projections – called awns – at the fruit's tip. Cutover muhly (*Muhlenbergia expansa*) does not have the elongate tip-awns, but it still retains an overall

wispy look. Pinewoods dropseed has a much more compact inflorescence with fruit-bearing branches arising in whorls. Gulf cordgrass (*Spartina spartinae*) is a clump-forming species of mainly coastal habitats, with occasional records further inland. Its inflorescences are markedly different from other potentially co-occurring bunchgrass species, in that its fruits are presented against the stem in a narrow, upright, spike, as opposed to in a panicle of many slender, fruit-bearing stalks that branch off the stem (Figure 2).

If plants are not flowering, leaf length can be useful for identification, as well as several subtle features near the plant's base. Gulf cordgrass is easiest to distinguish from the others, because its leaves are longest, up to 200 cm, comparatively rigid, and have a sharp tip. The leaves of Silveus' dropseed lack a sharp tip, can reach 52 cm long, and have a smooth, thick, shining, straw-colored outer sheath at the base that curves to the roots underground (Gould 1975). Leaves of pinewoods dropseed are shorter in length, up to 30 cm, and the sheath at the base is not thick, curved, or shining. Gulf muhly leaves can reach 80 cm in length, and they generally appear narrower than those of the other species. Because leaf lengths overlap in most of these species, additional features should be observed, such as the ligule. A ligule is a small projection or line of hairs on the inner surface of a grass leaf, where it departs from the stem. Muhlys have fairly long, paper-like ligules that are 1.5-3 mm long, whereas dropseeds have a barely-noticeable fringe of hairs, reaching only 0.2-0.8 mm long. An additional diagnostic feature lies just below the ligule around the outside of the leaf and stem, where dropseeds have a ring of white hairs, which muhlys lack. More information on the key characteristics of these species can be found in Gould (1975), Shaw (2012), the [SouthEast Regional Network of Expertise and Collections](#) (SERNEC), [Flora of the Southeastern United States](#), and [Flora of North America](#).

Silveus' dropseed was first described as a species in 1941, based on a collection made by W.A. Silveus within the Big Thicket region. The original specimen used for the species' description was collected at a location '10 miles north of Orange, Texas', and the plant was later provided to J.R. Swallen, who published its name and description in the *Journal of the Washington Academy of Sciences* (Swallen 1941). Since then, Silveus' dropseed has been recorded in two locations during the Big Thicket National Preserve's plant inventory by Harcombe (2007): one in the Jack Gore Baygall unit (in 2006) and the other in the Lance Rosier unit (in 1990). Although it has not been seen again in Jack Gore Baygall, it has been recently confirmed as present in the Lance Rosier unit by NPS Inventory and Monitoring staff. It was seen in one area north of Little Rock Road during the long-term vegetation monitoring event in 2022, and it was found in a few patches south of the road in 2024 (Figure 3). These locations are classified as 'sodic longleaf pine flatwoods', which occurs on or adjacent to Nona or Plank soils in that unit (USDA NRCS 2023; soil types described in next section).

With the acquisition of the Solo Tract in 2005, NPS gained over 75 hectares (185 acres) of additional wet longleaf pine flatwoods and potential Silveus' dropseed habitat. Because the property was obtained just as the park's plant inventory was wrapping up (Harcombe 2007), its flora remained largely undocumented. Regional botanist Larry Brown made one visit to the Solo Tract just prior to completing his inventory of Turkey Creek (Brown et al. 2005). There, he discovered the park's only examples of Nuttall's rayless goldenrod (*Bigelovia nuttallii*) as well as few other new species for the Preserve. The next botanical surveys were completed in 2015 and 2016, when vegetation mapping crews sampled 16 plots throughout the Solo Tract as part of the U.S. National Vegetation Classification (USNVC) mapping effort (Ley et al. 2024). The only bunchgrass recorded in the

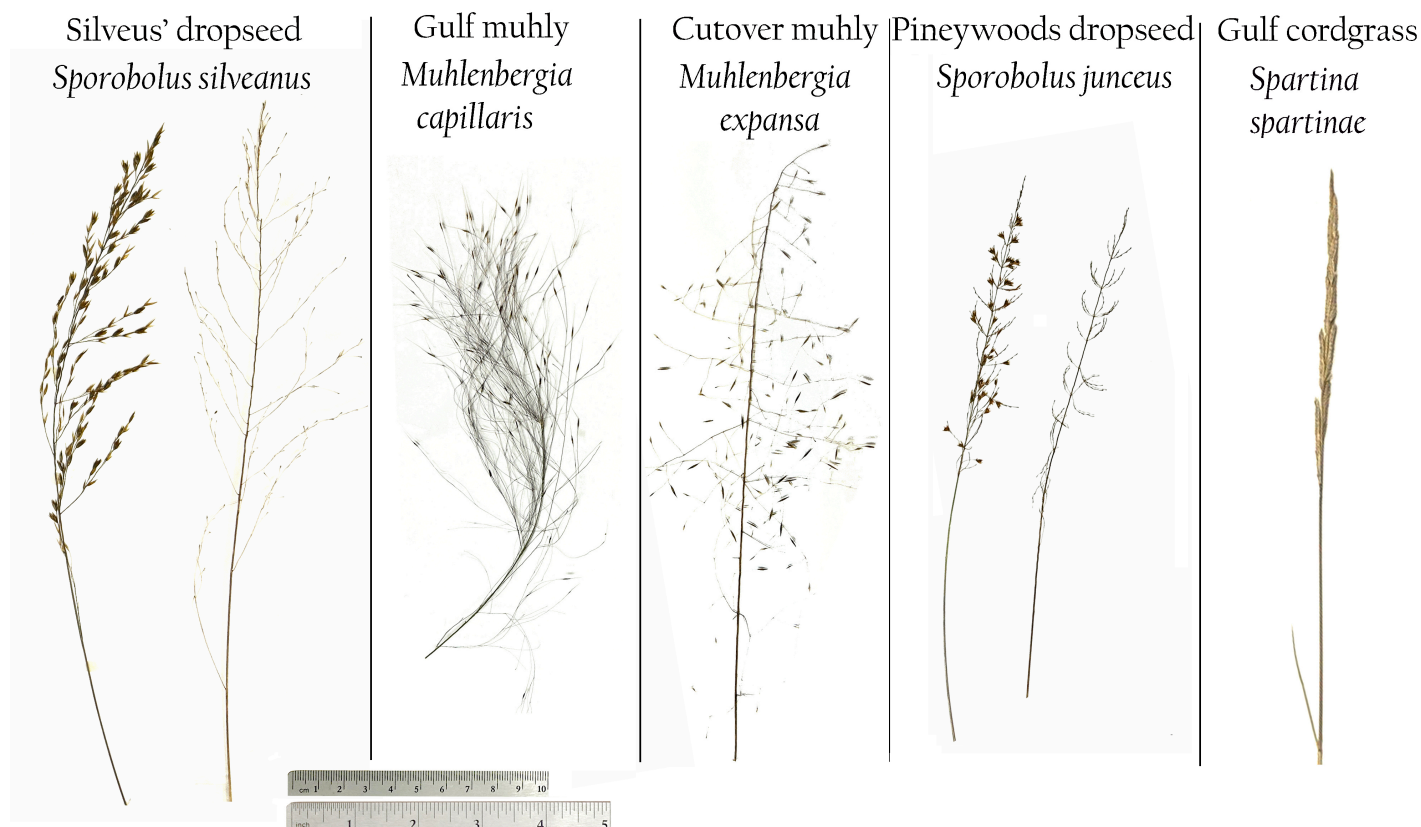


Figure 2. Inflorescences of five species of narrow-leaved bunchgrasses that can be found in the Big Thicket area.

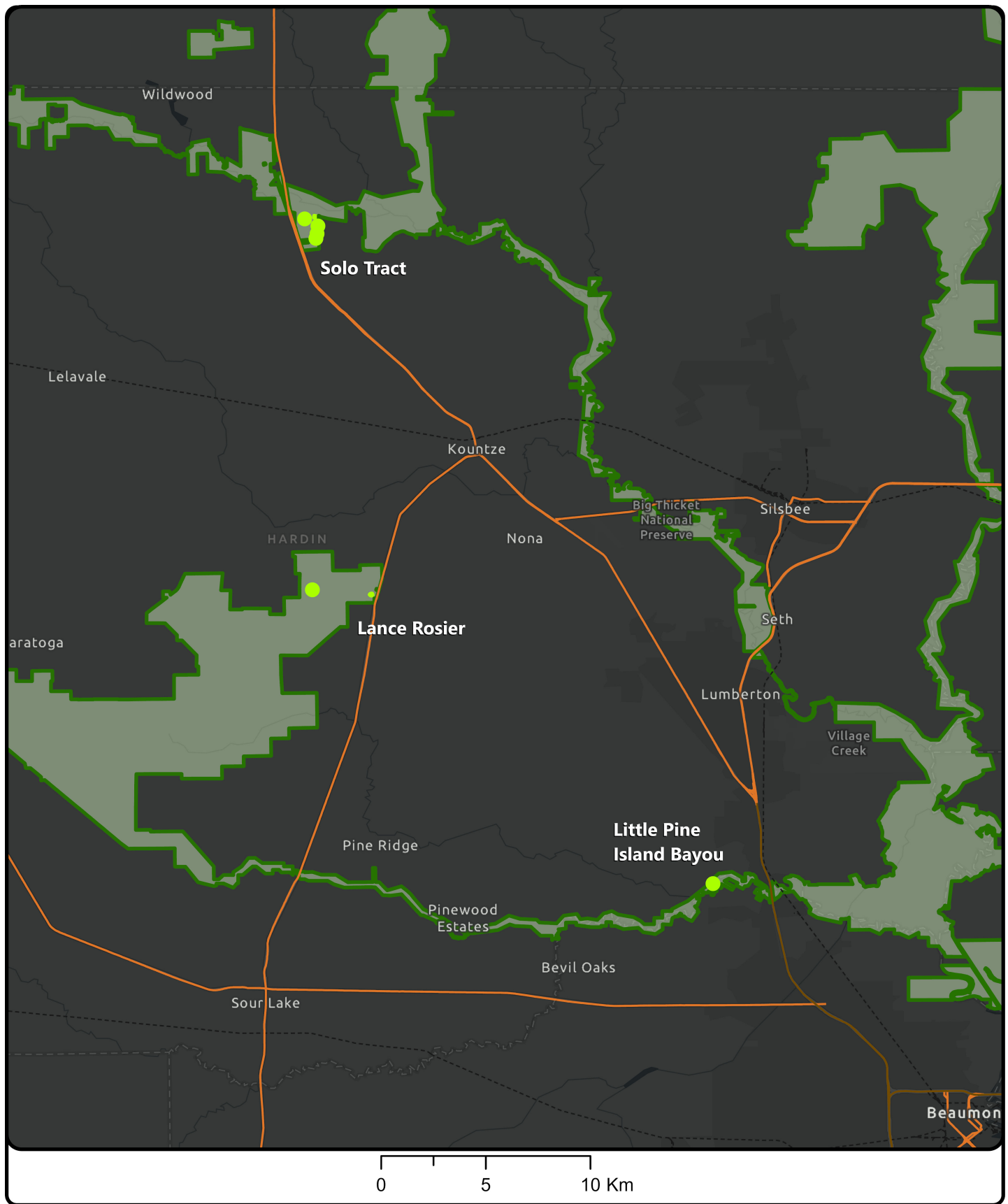


Figure 3. Recently-confirmed locations of *Silveus*' dropseed (light green outlines and dots) within Big Thicket National Preserve (dark green outlines), based on long-term plot sampling in 2022 and targeted surveys in 2024 and 2025. Focal park areas with white labels from north to south: Solo Tract near the park headquarters in Turkey Creek Unit; Northeastern corner of the Lance Rosier Unit, accessed via Little Rock Road; and Little Pine Island Bayou corridor near the bridge crossing for Highway 69, south of Lumberton.

Silveus' Dropseed in Big Thicket (cont.)

area was gulf muhly, which, as stated above, is easily confused with the dropseed. *Silveus*' dropseed was finally documented in the Solo Tract in April 2025, when I&M staff surveyed the area for that species and found several large patches (Figure 3).

A final, unexpected observation of the species was made in spring 2025, in a small natural clearing near Little Pine Island Bayou (Figure 3). *Silveus*' dropseed was found growing in clusters around the margins of an open, treeless area surrounded by forest (A. Bennett, personal communication). Given the site's location on the Beaumont formation and the absence of sodic soils mapped there, this community may be more closely related to coastal prairie than sodic longleaf pine flatwoods. The site's mapped soils – Evadale-Gist complex – are nevertheless similar to the Nona and Plank series and are typically found on and between mima mounds (Soil Survey Staff 2025). More study is needed for accurate classification of the plant community there.

The only other unit where this species is likely to occur is Hickory Creek, based on the presence of similar plant communities on poorly-drained soils (see also Streng and Harcombe 1982). No *Silveus*' dropseed plants were observed there during a brief initial survey in early 2025, but more thorough efforts are warranted.

Sodic Longleaf Pine Flatwoods & Their Management

Sodic longleaf pine flatwoods occur near the western edge of the longleaf pine distribution, which spans North Carolina south to Florida and west into Texas (Figure 4). Longleaf pine flatwoods are generally closer to the coast than the 'uplands', and in western Louisiana and eastern Texas, these flatwoods have varying been referred to as Wetland [Longleaf] Pine Savanna (Harcombe and Marks 1979; Bridges and Orzell 1989; Harcombe et al. 1993), Longleaf-Black Gum Savannas (Ajilvsgi 1979), or the western variant of Longleaf Pine Flatwoods Savanna (Smith 1996). The environmental feature that sets sodic longleaf pine flatwoods apart from other western longleaf pine communities is, in principle, their sodic soil type. Yet given the coarse scale of county-level soil maps and the general lack of higher resolution soils data, inferring sodic soil type in the field often requires reading elevation, landform, and the character of surrounding plants and surface soils, all in context with soil map data. This process would be further refined through consultation with soil scientists from the U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS).

Sodic soils are defined as having enough exchangeable sodium in the surface or subsurface layers to change soil structure and reduce soil permeability. The amount of salt in the soil is nevertheless below levels that would be classified as saline. In east Texas, sodic soils belong to one of the following soil series: Nona, Plank, or Vidor, and these are mainly found in Hardin, Jasper, and Newton counties (Figure 4). Sodic soils in nearby Louisiana are classified as Brimstone. Collectively, these four soil types are called 'sodic flats' in the USDA Ecological Site classification system (USDA NRCS 2023). In sodic soils of east Texas, surfaces are silty or sandy loams, occasionally with clay loam in the subsoil. Acidity tends to be high, and mima mounds are often present, creating small rises where trees and shrubs are more abundant, as well as herb-dominated depressions between them.

Plant communities on these sodic and sodic-adjacent soils are fire-adapted with overstories that historically would have been longleaf

pine, but are now more often loblolly (*Pinus taeda*) or slash (*Pinus elliottii*) pine. They prominently feature open, herbaceous clearings where trees and shrubs are absent or stunted, presumably due to soil chemistry and/or prolonged periods of standing water in the winter, followed by drought conditions in the summer. Within these landscapes, *Silveus*' dropseed has generally been found on the slopes of mima mounds or other relatively well-drained areas outside of the depressions. It is currently unclear whether the species is specifically tied to sodic soils in this part of its range, tied to other, adjacent or intermixed soil types, or tied more generally to tree-free areas. There are other longleaf pine flatwoods associations nearby that have little to no *Silveus*' dropseed (such as USNVC [CEGL007802](#)). These absences may be due to subtle differences in habitat requirements, such as inundation levels, or to historic local extirpation possibly linked to fire suppression.

The USNVC name for the sodic longleaf pine flatwoods association is Western Wet Longleaf Pine Savanna, Prairie Terraces Sodic Silt Loam Type ([CEGL003654](#)). This variant of longleaf pine flatwood had not been described prior to the 1990s; it was first documented by the Louisiana Natural Heritage Program (Smith et al. 1996) and then later classified for the USNVC. The most intact known example is found on a Nature Conservancy property in southwestern Louisiana called [Persimmon Gully Preserve](#). This site is on Brimstone sodic soil, which is most similar to the Vidor soil type in east Texas. Relative to Big Thicket, this site lies to the southeast, on the edge of the Beaumont geologic formation, whereas Lance Rosier and Turkey Creek are both on the Lissie formation. Despite this difference, floristic comparisons show that the sodic longleaf pine flatwoods at Big Thicket share the same defining USNVC characteristics as Persimmon Gully, and a site visit to Persimmon Gully in early 2025 confirmed their broad ecological overlap. In addition to the sodic soil character and the presence of *Silveus*' dropseed, both sites also have mima mounds, depressions, open areas with few or stunted woody plants, an otherwise pine-dominated overstory, and most importantly, a long list of plant species in common. A brief overview of floristic similarities is included in the following section.

The most striking difference between the Persimmon Gully and Big Thicket sodic longleaf pine flatwoods may be their management history, particularly in relation to fire. Persimmon Gully was frequently burned even before the Nature Conservancy took ownership in 1980. Since 1999, it has received prescribed fire once every three years, on average, with an emphasis on growing season burns (W. deGravelles, personal communication). At Big Thicket, in contrast, there have been no fires within the last two decades for most of the locations where *Silveus*' dropseed is known. This is especially the case for the pine flatwoods of the Lance Rosier unit, which has areas that have remained unburned since the 1980s. Even the most recently-burned sections of northeastern Lance Rosier unit were last burned in 2010. The only recently and regularly-burned area with *Silveus*' dropseed in Big Thicket is in the Solo Tract (Figure 3), which has been burned more than five times since the park took ownership in 2005, with the last prescribed fire in February 2022. In both the Solo Tract and Persimmon Gully, additional management actions have included herbicide and/or mastication to reduce shrub encroachment, slash and loblolly pine removal, and the planting of longleaf pine seedlings, often with the intention of future thinning (W. deGravelles, personal communication). Planted longleaf seedlings have had limited success in portions of both the Solo Tract and Nature Conservancy properties, presumably due to the harsh soil chemistry coupled with unfavorable moisture levels within both sites.

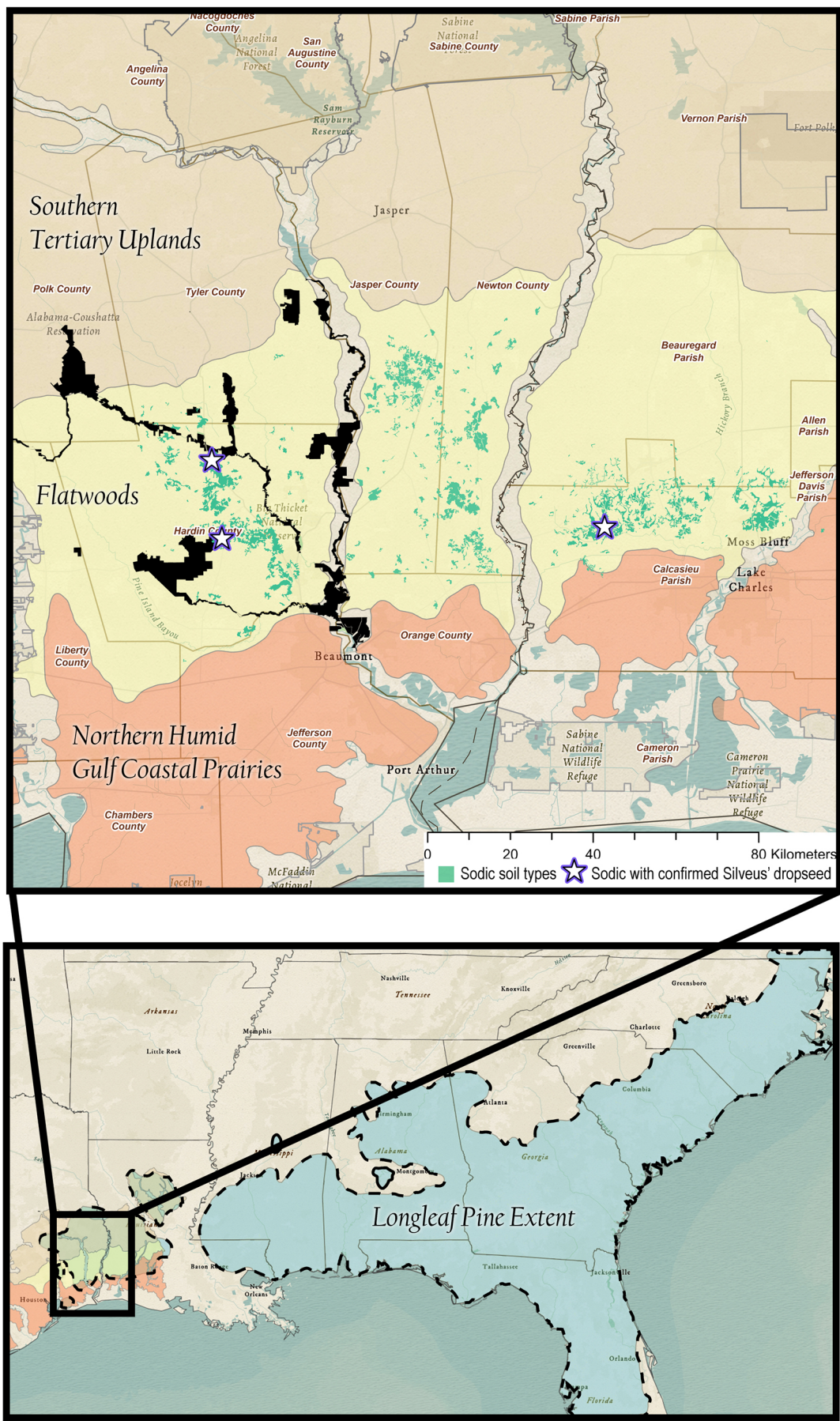


Figure 4. Upper map: The geographic extent of sodic soil types Nona, Plank, Vidor and Brimstone within eastern Texas and southwestern Louisiana, based on county-level NRCS soil maps. Stars indicate sodic longleaf pine flatwoods with confirmed records of *Silveus' dropseed*. The black polygons are properties owned by Big Thicket National Preserve. Tan, yellow, and orange shading represents level IV Ecoregions (Omernik and Griffith 2014). Lower map: the southeastern U.S. showing the historic range of longleaf pine in light blue shading with black dotted outline. Its disjunct westernmost extent is highlighted with the same level IV ecoregions as the upper map.

Silveus' Dropseed Habitats in Texas

There are five USNVC plant associations that are known to include *Silveus*' dropseed, and each of these have a Global Conservation Status rank of either imperiled or critically imperiled (G1 or G2; Master et al. 2012). Very few records of the species exist outside of one these five associations, and this is interpreted as evidence of habitat specificity, although it may also be a function of under-collection or confusion in species identification. All five of the focal associations tend towards acidic soils with moderate drainage that are typically adjacent to poorly-drained sites. All five also occur in natural openings where woody plant growth is more or less impeded, for example, due to near-surface bedrock or harsh soil conditions. The five *Silveus*' dropseed communities are all fire-adapted and feature other prairie grasses common to the region, such as little bluestem (*Schyzachyrium scoparium*), big bluestem (*Andropogon gerardii*), Virginia bluestem (*Andropogon virginicus*), splitbeard bluestem (*Andropogon ternarius*), or switchgrass (*Panicum virgatum*). From north to south within the range, the five focal associations are as follows.

- *Silveus*' dropseed is abundant in two types of **mesic prairies** on clay loam or fine sandy loam soils in Northeast Texas. Mima mounds are a common geomorphic feature in these types of prairies, as they are in other sites where *Silveus*' dropseed occurs. There are two well-known *Silveus*' dropseed prairies under protection in Northeast Texas, each featuring slightly different assemblages of plant species. These are found within Tridens Prairie (now Smiley Meadow) near Paris, TX ([CEGL004521](#), see also Diamond and Smeins 1985) and Daphne Prairie near Mount Vernon, TX ([CEGL002216](#)). Barbara's-buttons (*Marshallia caespitosa*) and longspike tridens (*Tridens strictus*) often co-occur with *Silveus*' dropseed in this part of the range, as well as in sites farther south. Prescribed fires are applied to both prairies by private land managers including the Nature Conservancy, approximately every other year.
- The species also occurs in **Catahoula barrens** ([CEGL002276](#)). In eastern Texas, the Catahoula geologic formation traces a narrow, southward-curving band that begins at the southern end of Toledo Bend Reservoir and passes above Sam Houston National Forest. Within this narrow strip, there are occasional sandstone outcrops in the pine forest that feature a unique group of plant species that includes *Silveus*' dropseed (Marietta and Nixon 1984). Rare plants that are known from this habitat include Navasota false foxglove (*Agalinis navasotensis*), Texas sunnybells (*Schoenolirion wrightii*), and slender blazing star (*Liatris tenuis*); all three are listed as Species of Greatest Conservation need by Texas Parks and Wildlife (2012). Other key species of this community that are known to co-occur with *Silveus*' dropseed elsewhere in its range include Barbara's-buttons (*Marshallia caespitosa*), longspike tridens (*Tridens strictus*), Arkansas least daisy (*Chaetopappa asteroides*), sharp blazing star (*Liatris acidota*), Nuttall's rayless goldenrod (*Bigelovia nutallii*), blackjack oak (*Quercus marilandica*), meadow pink (*Sabatia campestris*), and compass plant (*Silphium laciniatum*).
- There are a handful of localities for *Silveus*' dropseed in **sodic longleaf pine flatwoods** ([CEGL003654](#); see also 'Sodic Longleaf Pine Flatwoods and Their Management' section above). Key species that co-occur with *Silveus*' dropseed in sodic longleaf pine flatwoods and in other communities to the north or south are Barbara's-buttons (*Marshallia caespitosa*), gulf muhly

(*Muhlenbergia capillaris*), compass plant (*Silphium laciniatum*), Arkansas least daisy (*Chaetopappa asteroides*), Nuttall's rayless goldenrod (*Bigelovia nutallii*), blackjack oak (*Quercus marilandica*), sharp blazing star (*Liatris acidota*), and longspike tridens (*Tridens strictus*). In nearby depressions, notable species include fringed sneezeweed (*Helenium drummondii*), bog buttons (*Eriocaulon decangulare*), small butterwort (*Pinguicula pumila*), golden colicroot (*Aletris aurea*), southern bog clubmoss (*Lycopodiella appressa*), and a variety of sedge species. All of the species listed here are found in both Big Thicket and the Persimmon Gully Preserve, except for compass plant, which is currently recorded at Big Thicket only. The complete list of overlapping species for these two sodic longleaf pine flatwood areas is at least 90 species long, based on comparisons of herbarium records, I&M monitoring data, and park species lists.

- In the **Gulf Coastal Prairies** of east Texas, there are several locations where *Silveus*' dropseed is known, and for at least some, the grassland type is identified as Alfisol coastal prairie ([CEGL002208](#)). Examples include areas within Brazos Bend State Park and the Nature Conservancy's Nash Prairie Preserve in West Columbia, TX (Rosen 2007). The soils there are typically fine sandy loam, and mima mounds are often present. Key species of this community that are known to co-occur with *Silveus*' dropseed elsewhere in its range include gulf muhly (*Muhlenbergia capillaris*), Arkansas least daisy (*Chaetopappa asteroides*), meadow pink (*Sabatia campestris*), and sharp blazing star (*Liatris acidota*).

Conclusions

Silveus' dropseed, while geographically spanning much of East Texas, is rarely found outside of a handful of imperiled or critically imperiled habitats. From northern mesic prairies to wet pine savannas, these open, fire-adapted communities have lost much of their historic extent, and as a result, many plants that depend on them have become exceedingly rare. Recent work in Big Thicket National Preserve has confirmed the presence of *Silveus*' dropseed within several areas of longleaf pine flatwoods. These relatively treeless areas have long been recognized as unique; linking them to a critically-imperiled USNVC association of sodic soils provides new ecological context and highlights the value of their continued protection and management.

Although it is unusual to come across *Silveus*' dropseed in the wild, where it exists, it can occur in dense stands. If these dense stands were once more common, the species may have played an important role in carrying fire across portions of landscape, as is currently known for several bunchgrass species of the eastern coastal plain, such as wiregrass (*Aristida beyrichiana* or *Aristida stricta*), wireleaf dropseed (*Sporobolus teretifolius*), Carolina dropseed (*Sporobolus pinetorum*), or cutover muhly (*Muhlenbergia expansa*). Fire-stimulated flowering is also common within this group of bunchgrasses, which is also suggested here for *Silveus*' dropseed. For grass species that rarely reproduce without fire, long-term fire suppression will cause population declines even when other aspects of the site remain intact, such as when brush encroachment is limited by harsh soil conditions or woody plant removal.

Restoring regular, prescribed burns to all longleaf pine flatwoods at Big Thicket National Preserve is a long-term goal of many of its stakeholders. Expected benefits include more longleaf pine recruitment, richer and more open understories, and for species with fire-dependent reproduction, the potential for population growth.

Conclusions (cont.)

The high-quality, reproductive stands of *Silveus*' dropseed witnessed the year after prescribed fire at Persimmon Gully were direct evidence that such efforts can literally bear fruit. In the most fire-suppressed longleaf pine flatwoods in Big Thicket, additional measures may be needed, such as stand thinning, herbicide-treatment of brush, and targeted plantings, all of which are already helping restore longleaf habitat in other parts of the Preserve. Improving the outlook for rare species like *Silveus*' dropseed not only creates rich savannas that support longleaf pine, many specialized plants, and a diversity of animals, it also improves the resource for the Preserve's visiting public, which includes hunters, back-country campers, and all types of outdoor explorers.

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