Status of *Marshallia caespitosa* in Louisiana and deletion of var. *signata*

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**ABSTRACT**

*Marshallia caespitosa*, represented only by the nominate variety, is conservative and rare in Louisiana, and *M. caespitosa* var. *signata* should be deleted from the Flora of Louisiana. Published online www.phytologia.org Phytologia 106(1): 1-6 (March 20, 2024). ISSN 030319430.

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*Marshallia caespitosa* Nutt. ex. DC. (Asteraceae) is a small perennial forb native to the south-central United States (Watson 2006). It inhabits glades, prairies, and limestone outcrops in Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas (Diggs et al. 1999; Steyermark 1963; Watson 2006; Weakley 2023). Two varieties are often distinguished: var. *signata* Beadle and Boynton with branches midstem into multiple capitula and bears leaves beyond midstem and var. *caespitosa* with singular heads and a scapose appearance with the leaves basally disposed (Diggs et al. 1999; Steyermark 1963; Watson 2006; Weakley 2023) (Fig. 1). An endemic entity from the interior highlands of Arkansas and adjacent states would key to var. *signata* in most works and might confound treatments based on material from that region (Theo Witsell pers. comm., Weakley 2023).

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Figure 1. Type specimens of *Marshallia caespitosa* s.s. (left) (DOC, CC-BY-NC) and var. *signata* (right) (PH, CC-BY-NC).
I have had the pleasure to visit multiple populations of this species in Louisiana, and I have taken it upon myself to examine all of the Louisiana records available to me online and a sampling of records from across its range. I have made the following observations:

1. **Var. signata is absent** - I examined the Bossier (Thomas 100127 LSU, Fig. 2) and Caddo (“Thomas 160” LSU, Fig. 3) parish specimens cited in the Thomas and Allen (1996) atlas for this variety, which has been tracked in the state at the rank of S1 (critically imperiled) (Natureserve 2023, https://explorer.natureserve.org/). Apparently erroneous is the citation of the Caddo parish specimen as “Thomas 160” (Thomas and Allen 1996). The sheet Gandhi annotated and apparently references for his preceding text with Thomas (1989) is numbered “160A”, but it was collected by Roselie Overby, one of Dr. Thomas’ students, and might represent one of his confusing co-collections (Fig. 3). These specimens align best with var. caespitosa, although they bear multiple cauline leaves. Others have collected more typical, basally disposed specimens from these same sites (DTM 351 LSU, Reid 5731 LSU). Further, I have visited these stations, which are both Morse Clay prairie remnants, repeatedly since 2020 and I have found only var. caespitosa.

   Louisiana material of var. caespitosa sometimes has a few cauline leaves below midstem, but the scapes of such plants typically account for more than 50% of the height and they never have multiple heads. Such plants were examined by this genus’ monographer, Linda Watson and R.B. Channell (1957), and invariably annotated as var. caespitosa (R.S. Cocks, 20 April 1916 LSU, Theiret 25941 DUKE, Leggett 1381 TENN, Thomas 88373 USCH). The keys provided in Gandhi and Thomas (1989) and Correll and Johnston (1970) each rely solely on the disposition of the leaves, which probably accounts for the misapplication of the varieties.

   I found no convincing sheets to represent var. signata in the dozens of other Louisiana collections. I contend that var. signata should be deleted from the flora of Louisiana.

2. **The species is conservative** - “Coefficients of Conservatism” ranging from 6-10 have been assigned for the species as a whole (Reemts and Eidson 2019; Ladd and Thomas 2015; Kelley et al. in prep.). This indicates that the plant is intolerant of anthropogenic habitat disturbance. Indeed, its stations in Louisiana are grassland remnants of moderate to high quality. These include calcareous prairies, sodic barrens (often referred to as saline prairies), coastal prairies, and sodic pine savannas. The soils of these habitats are often alkaline, as is apparently the preference of the species rangewide. It shares these remnants with other rare and conservative plants, for example: Panicum flexile, Cooperia drummondii, Symphyotrichum ericoides, Houstonia lanceolata, Nemastylis geminiflora, Polytaenia nuttallii, Heliotropium tenellum, Sporobolus silveanus, Carex meadii, Camassia scilloides, Helianthemum rosamarinifolium, and Lechea san-sabeana (pers. obs.).

3. **The species is rare in the state** - Querying iNaturalist (https://www.inaturalist.org/) and SERNEC (http://sernecportal.org/portal/index.php) for digital records of the species in Louisiana yielded sixty-four apparently unique observations. I have annotated many of these and examined all of their dates, collectors, collection numbers, and localities to eliminate duplicates.

   While I cannot be certain on the number of localities, the records suggest there are less than forty separate populations (pinned locations or label data suggest this many discreet occurrences); at least fifteen (23%) of the record originated from just four sites (the occurrences at these sites separated by less than 1km each). Twenty-nine (45%) of these observations have been made in the past forty years, and 21 (32%) of them have been made in the past twenty. It has been collected from 10 parishes (Fig. 5) and has been observed in all but Jefferson Davis, Rapides, and Sabine.
parishes recently. The species typically occurs in small populations, although the largest population I have observed in the state contains 400,000-1,500,000 plants in an area of roughly 120 acres (Fig. 6). Many observations seem to be on unprotected sites such as roadsides. I have witnessed three populations damaged by herbicide in as many years and one of these appears to have been eliminated entirely. While the species is not tracked as rare on the Kisatchie National Forest, biologists there informed me that it is occasionally seen, particularly on the Vernon District (Dave Moore pers. comm.), and that two populations have been seen in the past three years (Christian Cobb pers. comm.).

This species, evidently uncommon on the Louisiana landscape, with most of its populations small, most historical, and many under threat from herbicide application and development, probably deserves a rank of S3 (vulnerable). The species has not recently been ranked by NatureServe; more than 2,700 records exist for the species on iNaturalist and SERNEC. Even allowing for duplicates and historical occurrences, the species appears globally secure, perhaps deserving a rank of G4.

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LITERATURE CITED

Figure 2. The Bossier specimen cited as the basis for var. *signata*’s presence in LA (LSU, CC-BY-NC)
Figure 3. The Caddo specimen cited as the basis for var. *signata*’s presence in LA (BRIT: NLU, CC0).
Figure 4. The parish-level distribution of *Marshallia caespitosa* vouchers in LA.

Figure 5. Largest known *Marshallia caespitosa* population in Louisiana, carpeting acres of calcareous prairie, Bossier parish.