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**SC Court of Appeals**

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**VIA ELECTRONIC FILING**

Jenny Abbott Kitchings, Clerk  
South Carolina Court of Appeals  
1220 Senate Street  
Columbia, SC 29201  
[ctappfilings@sccourts.org](mailto:ctappfilings@sccourts.org)

Re: S.C. Native Plant Society v. Spartanburg County Planning Commission, App. Case No. 2024-001828

Dear Ms. Kitchings:

This letter is filed in response to Mr. Shissias's Rule 208(b)(7) letter dated August 7, 2025. As Mr. Shissias's letter states, the United States Fish and Wildlife Service very recently issued a final rule finding that the dwarf-flowered heartleaf (*hexastylis naniflora*) is no longer categorized nationally as a "threatened" species, but it will continue monitoring this rare plant for five years. This federal agency action has no bearing on the South Carolina Native Plant Society's claims before this Court under the Spartanburg County Unified Land Management Ordinance.

First, the Spartanburg County Unified Land Management Ordinance, which is the governing legal authority in this case, does not limit its protections to species that have been characterized as nationally "endangered" or "threatened" by the federal bureaucracy of the U.S. Fish and Wildlife Service. That Ordinance requires the preservation of the "natural features and landscape" of this proposed RV park site. As the Society explained in its briefs, dwarf-flowered heartleaf is a rare plant that exists only in a limited wet forest habitat and only in a narrow band in three South Carolina counties (Greenville, Spartanburg, and Cherokee) and some nearby North Carolina counties. The plant is identified by the South Carolina Department of Natural Resources ("SC DNR") as a "species of greatest conservation need" in South Carolina, and a "Highest Priority" species, Society Initial Br. at 5, and SC DNR has established the Peters Creek Heritage Preserve in Spartanburg County to protect one population of this rare plant. *Id.* Accordingly, regardless of its categorization nationally by the federal agency, dwarf-flowered heartleaf remains an important and rare feature of the natural heritage of South Carolina and Spartanburg County. It is therefore an important "natural feature" and part of the "landscape" of the RV park site that the Ordinance requires to be preserved.

Second, SC DNR and the leading experts on dwarf-flowered heartleaf, two of whom reside in South Carolina, submitted comments to the U.S. Fish and Wildlife Service opposing the delisting. *See* SC DNR, Removal of the Dwarf-flowered Heartleaf from the Federal List of Endangered and Threatened Plants; Docket No. FWS-R4-ES-2019-0081 (June 24, 2021) (Attachment 1), Dr. Gillian Newberry, Proposed Delisting of *Hexastylis naniflora* (May 24, 2021) (Attachment 2); Dr. L.L. Gaddy, re: Endangered and threatened species: removal of the

dwarf-flowered heartleaf from the federal list of endangered and threatened plants (June 24, 2021) (Attachment 3). SC DNR’s comments detailed the significant threats that face the plant in South Carolina, including, relevant here, development pressure. *See* SC DNR Comments, Attachment 1 at 2. Accordingly, there is a consensus among South Carolina experts that this plant remains rare and at risk of loss in South Carolina.

Third, as the federal agency decision explains, that decision was premised primarily on the status of dwarf-flowered heartleaf populations in North Carolina. 90 Fed. Reg. 30004 (July 8, 2025); *see also* U.S. Fish and Wildlife Service, Species Status Assessment for Dwarf-flowered Heartleaf (May 2019). The status of these populations in North Carolina is very much disputed; experts believe that many of the populations in North Carolina may not even be dwarf-flowered heartleaf but another species, *see* Dr. Zack Murrell, Proposed Delisting of *Hexastylis naniflora* (June 25, 2021) (Attachment 4). The North Carolina populations, which were crucial to the federal agency’s action, have no bearing on the rarity and status of the plant in South Carolina. Moreover, even under the federal agency’s decision, dwarf-flowered heartleaf populations will be monitored for the next five years to continue to determine the status of the species nationally. *Id.* at 30007. There remains federal concern of the national status of the plant, apart from South Carolina.

The Spartanburg County Unified Land Management Ordinance mandates the preservation of the “natural features and landscape” of this proposed RV park site. For these reasons, dwarf-flowered heartleaf and its habitat are rare and important natural features in Spartanburg County and thus are required to be preserved under the Spartanburg County Unified Land Management Ordinance. The recent contested federal decision does nothing to change this fact.

Sincerely,

/s/ Emily Wyche  
Emily Wyche  
Southern Environmental Law Center  
525 East Bay Street, Suite 200  
Charleston, SC 29403  
[ewyche@selc.org](mailto:ewyche@selc.org)

*Counsel for SC Native Plant Society*

Cc:

Frank Holleman  
Alex Shissias  
Todd Flippin  
Carl Muller  
Kay Kelly

Attachment 1

SC DNR, Removal of the Dwarf-flowered Heartleaf from the Federal List of Endangered and Threatened Plants; Docket No. FWS-R4-ES-2019-0081 (June 24, 2021)

# South Carolina Department of Natural Resources



Robert H. Boyles, Jr.

**Director**

Ken Rentiers

Deputy Director for

Land, Water and Conservation

June 24, 2021

Public Comments Processing  
Attn: FWS-R4-ES-2019-0081  
U.S. Fish and Wildlife Service, MS: JAO/1N  
5275 Leesburg Pike  
Falls Church, VA 22041-3803

electronic submission

REFERENCE: Removal of the Dwarf-flowered Heartleaf from the Federal List of Endangered and Threatened Plants;  
Docket No. FWS-R4-ES-2019-0081

To whom it may concern,

The South Carolina Department of Natural Resources (SCDNR) is the state agency charged by state law with the management, protection and enhancement of wildlife, fisheries, and marine resources in South Carolina. SCDNR's mission is to serve as the principal advocate for and steward of South Carolina's natural resources. (SCDNR authorities and responsibilities are described in Titles 48, 49 and 50, South Carolina Code of Laws (1976), as amended).

SCDNR Staff have reviewed the proposal to remove dwarf-flowered heartleaf (*Hexastylis naniflora*) from the Federal List of Endangered and Threatened Plants, as published in the Federal Register on April 26, 2021.

The SCDNR finds the conclusion to de-list dwarf-flowered heartleaf as a threatened species as premature. Therefore, the agency offers the following comments in support of continuing protections for this species as a threatened species under the Endangered Species Act (ESA). This recommendation is based on the review of analyses presented in the May 2019 Species Status Assessment, Version 2.0 (SSA2). The SCDNR finds that the SSA2 presents: 1) flawed data on the number of populations and range, in part because of ongoing taxonomic research, but also because there is no recent observation of 41 (34%) of the reported populations, and 2) insufficient consideration of future threats in a rapidly growing area of South Carolina.

Thus, the SCDNR recommends that the USFWS delay removal of dwarf-flowered heartleaf pending publication of ongoing taxonomic research, and a re-evaluation of total numbers of populations. The best available research, pending publication, is that *H. naniflora* likely represents two species (Zach Murrell, Appalachian State University, personal communication, 2021). Therefore, the geographic range of *H. naniflora* is smaller and there are fewer populations than reported. Additionally, the SCDNR advises further field work to better document the total number of extant populations. The Draft Post-Delisting Monitoring Plan and press release of the delisting states 119 populations of dwarf-flowered heartleaf.

*"Today, there are at least 119 populations scattered across 10 North Carolina and three South Carolina counties."*

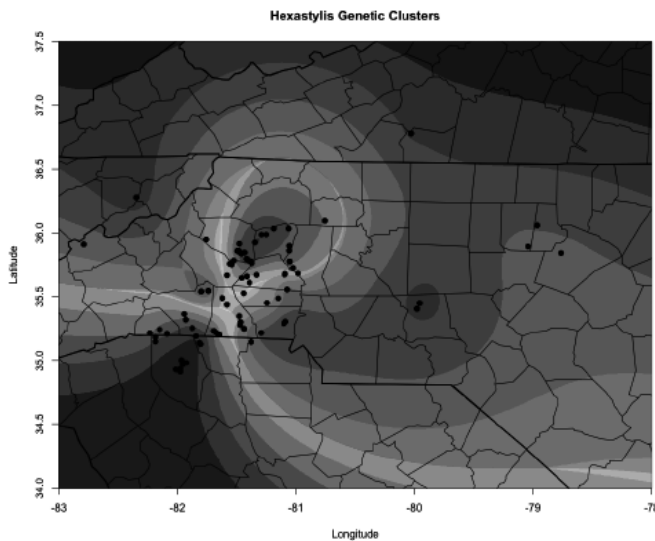
However, this statement is not supported by the SSA2, which reports that 119 total populations have been documented, but that at the time of the SSA2, only 78 were known with certainty to be extant. While some of the 41 unaccounted for populations are likely extant, this large discrepancy and the report of 119 populations is misleading.

The agency has concerns that neither 119 nor 78 populations represent the actual number of reported and known populations because of taxonomic understanding not fully considered in the SSA2. Genetic research currently underway, by Dr. Zach Murrell and Dr. Matt Estep at Appalachian State University, has found that the northernmost populations

located in North Carolina of what has been reported to be *H. naniflora* probably represents a combination of a new undescribed species, in part, as well as hybrid populations (Z. Murrell, personal communication, 2021). This includes North Carolina's Alexander, Burke, Caldwell, Catawba, and Iredell counties. Removing population counts from these counties reduces the total from 119 to 79 populations (with some of those likely extirpated). This is better visualized in Figure 4.1 in the SSA2 (included below), which indicates an even smaller range of "true" *H. naniflora*, restricted to South Carolina and only southern Polk, Rutherford, and Cleveland counties in North Carolina. The SSA2 states that:

*“. . . we assume all EO detections are Hexastylis naniflora, and represent the best currently available scientific data.”*

While the research of Drs. Murrell and Estep have not yet been published, the SCDNR finds that these preliminary research findings be acknowledged and considered in the decision to delist, as these findings conflict with the reasoning for delisting in the SSA2. Therefore, the SSA2 does not represent the best currently available scientific data.



**Figure 4.1.** Recent genetic analyses detailing clustering of the genus *Hexastylis*. Black dots represent GIS locations of individual plants included in the genetic analysis. Green areas represent "true" *H. naniflora*; Blue represents a possible new species; Red represents other species in the genus (*H. minor*, *H. heterophylla*, etc.).

Additionally, the SCDNR is concerned regarding the delisting due to the uncertainty surrounding long-term and unpredictable changes in habitat quality in South Carolina. In South Carolina, the species is known from Cherokee, Greenville, and Spartanburg counties. U.S. Census data presented by the South Carolina Revenue and Fiscal Affairs Office<sup>1</sup> shows 2020-2035 population changes of 2%, 24%, and 23% from these counties respectively, based on a 2019 data revision. The census data in the SSA2 was based on 2007 estimates and underrepresents human population change (14% (Cherokee), 15% (Greenville), and 13% (Spartanburg)). Out of the 46 counties in South Carolina, Greenville and Spartanburg counties are the 8<sup>th</sup> and 9<sup>th</sup> fastest growing. Human population growth and the associated land development has implications for 1) discovery of new populations of *H. naniflora*, 2) loss of known populations, and 3) pressure on protected populations.

Lands containing populations of *H. naniflora* that are protected, either by government agencies or non-governmental organizations, will face increasing pressures as human populations increase. The ESA listed threats for dwarf flowered heartleaf include "development, incompatible forestry practices, agriculture, trampling, invasive exotic species, sedimentation, erosion, and road construction." The SCDNR finds the SSA2 does not truly encompass the ecological impacts that correlate with increasing development pressure. The SSA2 explicitly states the limited habitat of this species:

*"The habitat is limited in size and scope due to a multitude of factors including soil type, moisture availability, and slope aspect (Wagner 2013). This unique combination of factors limits not only the range of dwarf-flowered heartleaf, but also the size of a given population."*

<sup>1</sup> <https://rfa.sc.gov/data-research/population-demographics/census-state-data-center/population-estimates-projections>

In South Carolina, state and federal protected lands with *H. naniflora* are small and fragmented, ranging in size from 19 acres to 842 acres. Within these, the species is limited primarily to narrow bands along creeks and seeps, occupying only a small amount of the protected land. As managers of five properties with *H. naniflora*, the SCDNR is seeing increasing threats, such as feral hogs and invasive pest plant species, which will certainly increase. Feral hogs are not considered in the SSA2 but the destructive nature this species can have on habitat along waterways where *H. naniflora* occurs could be devastating to the species. Invasive pest plant species represent a major problem too, including Chinese privet (*Ligustrum sinense*), Japanese stilt grass (*Microstegium vimineum*), Fig buttercup (*Ranunculus ficaria*), *Rosa multiflora* (Multiflora rose), Glossy privet (*Ligustrum lucidum*), Autumn olive (*Elaeagnus pungens*), Wild basil (*Clinopodium gracile*) and others. These species will become more problematic as more development surrounds protected lands. Invasion of these species will lead to several negative impacts, including direct competition for sunlight, but may also change hydrology, increase erosion, and change seasonal canopy coverage (e.g., more shading in winter).

Absent from the SSA2 and its analyses are potential future changes in hydrology. Because *H. naniflora* often grows along small streams and piedmont seeps (sometimes with the federally endangered bunched arrowhead (*Sagittaria fasciculata*)), increasing development activities in uplands are likely to alter regional hydrology which will negatively impact this species. Increasing densities of invasive plant species may also change local hydrology.

Therefore, in summary, the SCDNR asks the USFWS reconsider the proposal to delist the species and consider additional findings from researchers working on the taxonomy of the *Hexastylis* species, the threat of development across the Piedmont of South Carolina, and the potential for impacts from invasive species on the future sustainability of dwarf-flowered heartleaf.

Thank you for the opportunity to review and provide comments. We look forward to continued coordination with the USFWS on this proposal and continued efforts to utilize the best science available to protect and manage dwarf-flowered heartleaf.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Bradley', with a long horizontal stroke extending to the right.

Keith A. Bradley, Botanist

Attachment 2

Dr. Gillian Newberry, Proposed Delisting of *Hexastylis naniflora* (May 24, 2021)

Dr. Gillian Newberry  
430 Saranac Drive  
Spartanburg, SC 29301

Public Comments Processing

Attn: FWS-R4-ES-2019-0081

U.S. Fish and Wildlife Service, MS: JAO/1N

5275 Leesburg Pike

Falls Church, VA 22041-3803

Re: Proposed Delisting of *Hexastylis naniflora*

Dear Friends at the Fish and Wildlife Service,

I am submitting these comments on the proposed delisting of *Hexastylis naniflora*. I am a retired professor of botany at the University of South Carolina Upstate.

I have studied the populations of *Hexastylis* in the

upstate of South Carolina and adjacent North Carolina since the mid 80's. Peter's Creek Heritage Trust Preserve and the Blackwell Heritage Trust Preserve have been established to save two large populations of Dwarf Flowering Heartleaf. I have monitored these tracts for over the past 50 years and they are remaining stable. The smaller populations have not done as well. At least thirty percent of these populations have been seriously impacted or have disappeared entirely. The long term survival of this species is still uncertain. These plants are slow growing and produce at best several new leaves a year. I have monitored some plants for 30 years and they still had a single leaf.

During droughts and exceptionally hot summers, they will drop all their leaves and lie dormant until

the following spring. The seeds are dispersed by ants which greatly limits the range expansion. I have monitored many plants for over 30 years that still have a single leaf.

*Hexastylis naniflora* is found in upper Spartanburg and Greenville Counties and in Henderson County, North Carolina. Thus, it has a very limited range. There have been suggestions that

this species should be lumped with *Hexastylis heterophylla* and perhaps *H. virginiana*. This would artificially broaden its range while dismissing population differences. It would make this species appear to be no longer threatened.

The cluster of closely related species is what would be expected when populations have been isolated into groupings that no longer share a gene pool. In this isolation, populations mutate and a process of speciation begins. If the "lumpers" have their way this divergent speciation will be harder to follow.

I write this in the hopes of saving the diversity about us.

Sincerely

Dr. Gillian Newberry

Cc:Sierra Weaver, Esq.

Southern Environmental Law Center

601 West Rosemary St.

Suite 200

Chapel Hill, NC 27516

Attachment 3

Dr. L.L. Gaddy, re: Endangered and threatened species: removal of the dwarf-flowered heartleaf from the federal list of endangered and threatened plants (June 24, 2021)

# terra incognita

125 S. Edisto Avenue, Columbia, SC 29205

llgaddy2@gmail.com 803 629-6128

June 24, 2021

re: Endangered and threatened species: removal of the dwarf-flowered heartleaf from the federal list of endangered and threatened plants

Sirs/Mme:

It can be asserted that as much as 50% of the known global population of *Shortia galacifolia* (Oconee bells) may have been inundated by the creation of Lake Jocassee along the Blue Ridge front in North and South Carolina. Oconee bells, like Venus flytrap (*Dionaea muscipula*) and *Hexastylis naniflora* (dwarf-flowered heartleaf) are all North Carolina-South Carolina endemics—species found only in these two states and nowhere else. If the Fish and Wildlife Service has their way, none of these three vascular plant species will be protected by Federal law.

As was the case with *Shortia*, acres of *Hexastylis naniflora* were probably destroyed by the creation of Lake Bowen in Spartanburg, South Carolina and Lake James in North Carolina. *Hexastylis naniflora* is a narrow endemic species found only on a few soil types, soils that occur along streams, in bogs, and on low bluffs. Like many endemics, *Hexastylis naniflora* is often locally common, even abundant, but its range is limited to the Piedmont of North and South Carolina. The rarity of endemics is misunderstood. Unlike many other plant species, population range and size are severely limited. The precise habitat of the endemic is determined by micro-features (such as soil types), and their mega-population size is controlled by geography. Because of genetic similarity from plant to plant, narrow endemics are very susceptible to extinction by disease or large ecological disasters (creation of lakes that inundate large populations of the plant). Our famous two-state endemics are part of our Carolina natural heritage and should all be protected and not delisted. If the Federal government will not protect these plants, who will? Let's keep *Hexastylis naniflora* on the list and add *Shortia galacifolia* and *Dionaea muscipula*.

**L. L. Gaddy, botanist, naturalist, and biogeographer**  
**Ph. D., University of Georgia, 1985; President of terra incognita**

Gaddy, L. L. 1987. A review of the taxonomy and biogeography of *Hexastylis*. *Castanea* 52:186-196.  
Whittemore, A. T. and L. L. Gaddy. 1997. *Hexastylis*, pp. 54-58 In *Flora of North America*, Volume 3, Oxford University Press, New York, London. 590 p.

**endangered species/natural areas/wetland inventory    conservation easement and planning**

Attachment 4

Dr. Zack Murrell, Proposed Delisting of *Hexastylis naniflora* (June 25, 2021)

Department of Biology  
Rankin Science Building  
PO Box 32027  
Boone, North Carolina 28608-2027  
(828) 262-3025  
FAX (828) 262-2127

June 25, 2021

Public Comments Processing  
Attn: FWS-R4-ES-2019-0081  
U.S. Fish and Wildlife Service, MS: JAO/1N  
5275 Leesburg Pike  
Falls Church, VA 22041-3803

Re: Proposed Delisting of *Hexastylis naniflora*

Dear Friends at the US Fish and Wildlife Service,

I am submitting these comments on the proposed delisting of *Hexastylis naniflora*. I am a professor of botany at the Appalachian State University. I base my comments on my extensive work with this species over the past two decades, one 2015 publication, two technical reports to the NC Department of Transportation (2003 and 2015), two MS theses generated at AppState (Hampstead 2013 and Padgett 2004), and one unpublished manuscript. These citations are listed at the end of this letter.

*Hexastylis naniflora* is distributed in the foothills of North and South Carolina and its distribution overlaps one of the most rapidly developing areas of the country. The plants do not compete well with disturbance caused by deforestation and suburbanization, yet many of the known populations are facing encroaching development. The herbaceous plants appear to very long-lived. Their pollination and seed dispersal mechanisms generally prohibit long distance dispersal; ants have been implicated as a major disperser of seeds for this species.

Three lines of evidence currently support splitting the 16 county distribution spanning North Carolina and South Carolina into two species: 1) morphological data, 2) microsatellite genetic data and 3) biogeographic data. The populations in the southern counties of Cherokee, Greenville, Spartanburg and York Counties, SC, and Cleveland, Gaston, Polk and Rutherford Counties, NC appear to be the "typical" small-flowered *Hexastylis naniflora*. The populations in the more northern counties of Alexander, Burke, Caldwell, Catawba, Iredell, Lincoln, Wilkes and Yadkin Counties, NC represent, based upon our current understanding of the microsatellite data, a new unnamed species. It is my intention to complete the manuscript that describes this new species within the next year.

There are two points of interest with this new understanding of what has been known as *Hexastylis naniflora*. First, the southern "typical" *Hexastylis naniflora* distribution matches the Broad River drainage, with the new species found in the Catawba and Yadkin River drainages. Second, there appears to have been some historical increase in the size characters used to delineate this species that has apparently led to a significant increase in the circumscription of the "typical" species, while at the same time obscuring the existence of the new species. The concordance of the microsatellite genetic data with the river drainages is particularly noteworthy.

Based upon our unpublished data, I suggest that this decision to delist *Hexastylis naniflora* should be postponed for two years to allow the biodiversity community to assess our current knowledge. Delisting

this species would have a significant negative impact on both the northern and southern populations that would be irreversible. *Hexastylis naniflora* in the Broad River drainage and its putative sister species in the Catawba and Yadkin River drainages are both located in fairly well-developed forests along streams and creeks throughout the region. Delisting now would increase the likelihood that these areas would be developed and these habitats would be lost to any future efforts to conserve the species and their genetic diversity. I urge a cautious approach that would allow us to make well-informed decisions regarding the conservation of this valuable natural resource.

Thank you for the opportunity to take part in this discussion. I'm happy to assist the USFWS in any capacity to help with your decision-making process.

Sincerely,



Zack E. Murrell  
Chair, Department of Biology  
Director, SERNEC (SouthEast Regional Network of Expertise and Collections)

**Hexastylis resources generated by my lab group:**

Hamstead, J. W., B. Snider, R. Oaks, E. Fitzgerald, J. Woodward, A. Teat, N. Hay, M. C. Estep, Z. E. Murrell. 2015. Sixteen Polymorphic Microsatellite Markers for a federally threatened species *Hexastylis naniflora* (Aristolochiaceae) and co-occurring congeners. *Applications in Plant Sciences* 3(7). DOI: 10.3732/apps.1500033.

Murrell, Z. E., J. Hampstead, J. McKenna and M.C. Estep. 2015. Development of molecular and morphological tools to circumscribe and identify the Dwarf Flowered Heartleaf (*Hexastylis naniflora*). Submitted to North Carolina Department of Transportation. 69 pp.

Murrell, Z. E., James Padgett, Emily Gillespie, and Falina Williams. 2003. *Hexastylis naniflora*. Technical report to the North Carolina Department of Transportation. 154 pp.

Jackie Wagner. *Biology of Hexastylis naniflora*. M.S. completed August 2013.

J. Padgett. *Species delineation in the Hexastylis naniflora complex*. M.S. completed May 2004.

Murrell, Z. E., M. Estep, J. Hampstead, J. McKenna and N. Hay. Genetic structure of a rare endemic *Hexastylis* and a co-occurring cryptic species. To be submitted to *Systematic Botany*.