



Seven new species of *Trichostema* (Lamiaceae: Ajugoideae) from the North American Coastal Plain biodiversity hotspot

R. KEVAN SCHOONOVER MCCLELLAND^{1,3,*}, ALAN S. WEAKLEY^{2,4} & DERICK B. POINDEXTER^{2,5}

¹ Department of Biology, Elon University, Elon, NC

² UNC-CH Herbarium (NCU), North Carolina Botanical Garden, and Department of Biology, University of North Carolina-Chapel Hill, Chapel Hill, NC

³ ✉ kschoonovermcclell@elon.edu; <https://orcid.org/0000-0001-5353-4119>

⁴ ✉ weakley@unc.edu; <https://orcid.org/0000-0003-2093-3767>

⁵ ✉ poindexter@unc.edu; <https://orcid.org/0000-0002-6446-7107>

*Author for correspondence

Abstract

Trichostema section *Trichostema* occurs in the North American Coastal Plain biodiversity hotspot. Much of the previously noted morphological diversity in this section has so far gone unstudied. A combination of extensive field studies, principal components analyses and statistical tests on morphological data, common garden experiments, nextRAD sequencing, and Bayesian phylogenetic techniques was used to discover and describe taxonomic entities. The Bayesian phylogeny resolved strongly supported clades that mirrored the morphological, ecological, and geographic findings. Given the preponderance of the data, seven new taxa are described herein at species level.

Keywords: BEAST, Florida, General lineage concept, Taxonomy

Introduction

Trichostema Gronov. in Linnaeus (1753: 598) is a genus of mints (Lamiaceae) endemic to North America that are largely xeric specialists. This genus has traditionally been split into five sections based on morphology, life history, and chromosome number (Lewis 1945; Lewis 1960). The type section of *Trichostema*, section *Trichostema*, currently includes four species: *Trichostema dichotomum* Linnaeus (1753: 598), *T. setaceum* Houttuyn (1778: 428–429), *T. suffrutescens* Kearney (1894: 483), and *T. nesophilum* K. S. McClelland and Weakley (2019: 109–110). All four species occur in a recently recognized biodiversity hotspot: the North American Coastal Plain (Noss *et al.* 2015). The xeric landscapes of Florida in particular have been shaped by millions of years of dynamic geologic change resulting in a high number of endemic taxa (Christman & Judd 1990; Deyrup 1989; Sorrie & Weakley 2001) and distinct biogeographic patterns (Soltis *et al.* 2006; Sorrie & Weakley 2001), as observed in a few other areas of the world under similar geological and climatic conditions (e.g. Casella *et al.* 2023; Perrino *et al.* 2022; Perrino *et al.* 2013; Wulff *et al.* 2013; Ozkan and Suel 2008). The ridge systems of peninsular Florida have provided isolated xeric habitats where speciation can and has occurred, for example in *Dicerandra* Benth in Lindley (1830; Huck *et al.* 1989; Oliviera *et al.* 2007), *Conradina* A. Gray (1870: 294–295; Edwards *et al.* 2006), and *Polygonella* Michaux (1803: 240–241; Schuster *et al.* 2011). *Trichostema* section *Trichostema* also shows this pattern of diversity, with morphologically and ecologically distinct entities occurring on various xeric ridges of the peninsula and on the barrier island chains (McClelland 2022).

Lewis (1945, 1960) and Huang *et al.* (2008) represent the only whole-genus studies of *Trichostema* since Bentham (1835). Lewis' investigations involved thorough morphological and cytological studies but occurred before genetic data were available. Huang *et al.* (2008) focused on the nuclear “barcode” genes ITS 1–5.8S–ITS 2, the chloroplast “barcode” gene *ndhF*, and morphology to build their phylogenies using maximum parsimony analyses. The present study combines the morphological rigor of Lewis' (1945) study with more recent sequencing and statistical modeling techniques than were used in Huang *et al.* (2008). Thus, a multi-pronged approach to species delimitation was used for studying *Trichostema* sect. *Trichostema* following the guidelines put forward by Poindexter (2019). Multiple lines

of evidence were utilized to assess the morphological, ecological, cytological, and genetic diversity present in section *Trichostema*. The concepts of *Trichostema* sp. 02 (Weakley 2005) and the *T. suffrutescens* with “exceptionally narrow leaves” (Lewis 1945) were further explored. Extensive field studies found five additional taxonomic entities. The majority of these are associated with ridge or island systems of Florida or the Gulf Coast. A review of published names in section *Trichostema* (McClelland 2022) showed all previously published names were based on type specimens that fall within the species concept of one of the four currently recognized species. Thus, new names are provided for usage going forward, including in the Flora of North America and Flora of the Southeastern United States (Weakley *et al.* 2023). Additional details of monographic work are available in McClelland (2022).

Materials and methods

Habitat data, voucher specimens, seeds, and leaf tissue were collected from 167 sites in Alabama, Florida, Georgia, Mississippi, North Carolina, and South Carolina. Habitats were described using the *Guide to the Natural Communities of Florida* (Florida Natural Areas Inventory 2010). All vouchers have at least one herbarium sheet deposited at the University of North Carolina Herbarium (NCU) with a subset also having leaf tissue preserved in silica gel at the North Carolina Botanical Garden (NCBG). Fruits were placed in resealable plastic bags for storage. Leaves for genetic analysis were preserved using silica gel in resealable plastic bags. Fruits and leaf tissue remaining after the study was complete were deposited at NCBG.

Quantitative and qualitative morphological data were collected from 913 herbarium specimens covering the four currently recognized species in section *Trichostema* and the seven additional taxonomic entities (Table 1). Quantitative characters were measured using a dissecting microscope and a micrometer (2018–2020) or a digital caliper (2020–2021). Qualitative characters were coded as presence/absence and included branching pattern (defined as having primary branching occurring at the base, middle, or upper part of the plant); the type (defined as upwardly curved, spreading, or downwardly curved; Figure 1) and length (defined by cell number) of trichomes, glandular and eglandular, on the stem; type and length of trichomes at the nodes (defined like the stem trichomes); type and length of trichomes, glandular and eglandular, in the inflorescence branches (defined like the stem trichomes); shape of the leaf (defined as widest toward the base, near the middle, or towards the apex), leaf apex (defined as acute, $\pm 90^\circ$, obtuse, rounded, or emarginate), and leaf base (defined as cuneate, rounded, or attenuate); shape of the bract, bract apex, and bract base (all defined like the leaves); branching pattern of the style (the style in *Trichostema* is bifid and the ratio of the relative lengths of the two branches ranges from 1:1 to 1:10); and ornamentation of the mature nutlets (the nutlets of *Trichostema* are rugose with ridges and alveoli; ornamentation was defined by relative size of the ridges [short, mid-sized, or tall] and alveoli [small, mid-sized, or large]; Figure 2). Character data were summarized in Microsoft Excel (Microsoft 2016) and by using R v4.1.2 (R Core Team 2021) utilizing RStudio v2022.02.3 (RStudio Team 2022). Averages and standard deviations were calculated using Microsoft Excel. Data were visualized using ggplot2 (Wickham 2016) and factoextra (Kassambara and Mundt 2020) in R. Dunn’s tests were employed with significant results being further analyzed using Kruskal-Wallis rank-sum tests with a Bonferroni correction in the dunn.test package (Dinno 2017). Principal components analyses (PCAs) were performed using *prcomp* in stats (R Core Team 2021) and visualized using *fviz* functions in factoextra (Kassambara and Mundt 2020).

TABLE 1. Total number of specimens per species used in the morphological analyses.

Species	Specimen Count
<i>Trichostema dichotomum</i>	198
<i>T. setaceum</i>	132
<i>T. suffrutescens</i>	21
<i>T. nesophilum</i>	62
<i>T. floridanum</i>	181
<i>T. fruticosum</i>	105
<i>T. latens</i>	10
<i>T. bridgesii-orzellii</i>	108
<i>T. gracile</i>	52
<i>T. hobe</i>	29
<i>T. microphyllum</i>	15

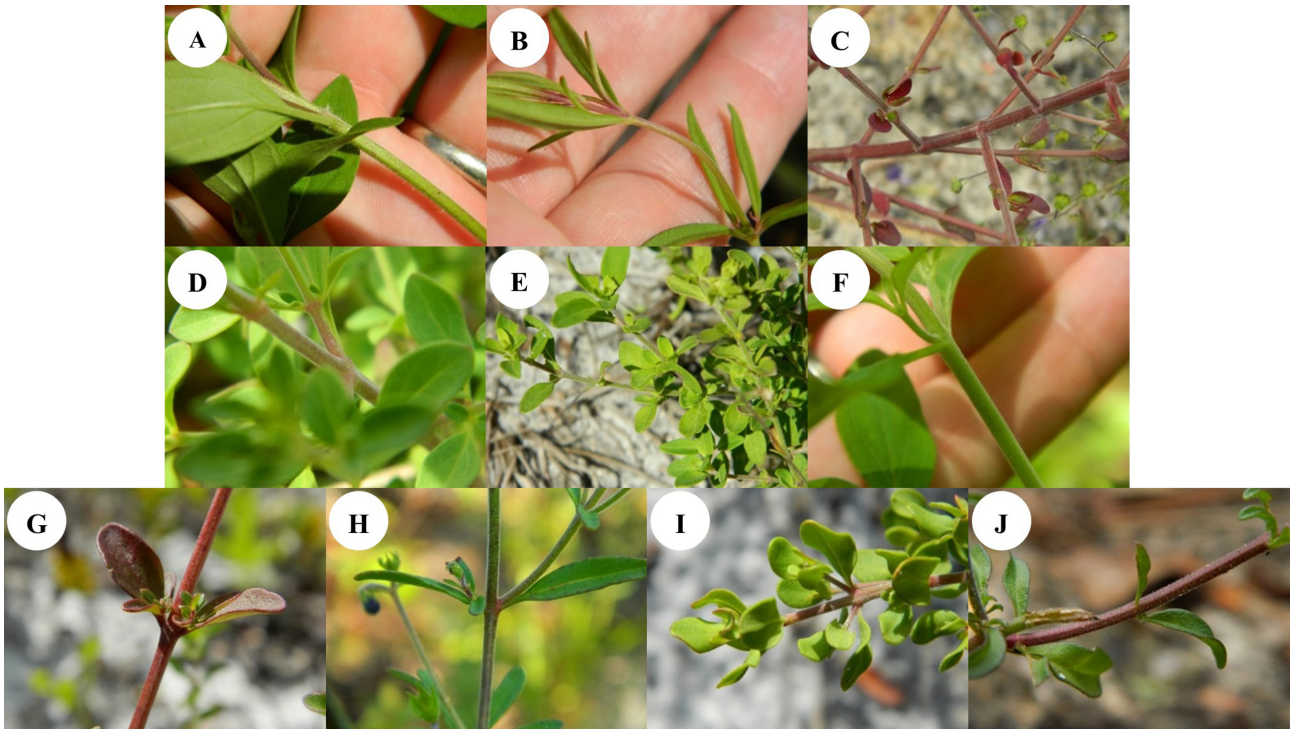


FIGURE 1. Detail of the stem and node trichomes of *Trichostema* section *Trichostema*. A) *Trichostema dichotomum*, B) *T. setaceum*, C) *T. suffrutescens*, D) *T. nesophilum*, E) *T. floridanum*, F) *T. fruticosum*, G) *T. bridgesii-orzellii*, H) *T. gracile*, I) *T. hobe*, J) *T. microphyllum*. Photos by R. Kevan Schoonover McClelland.

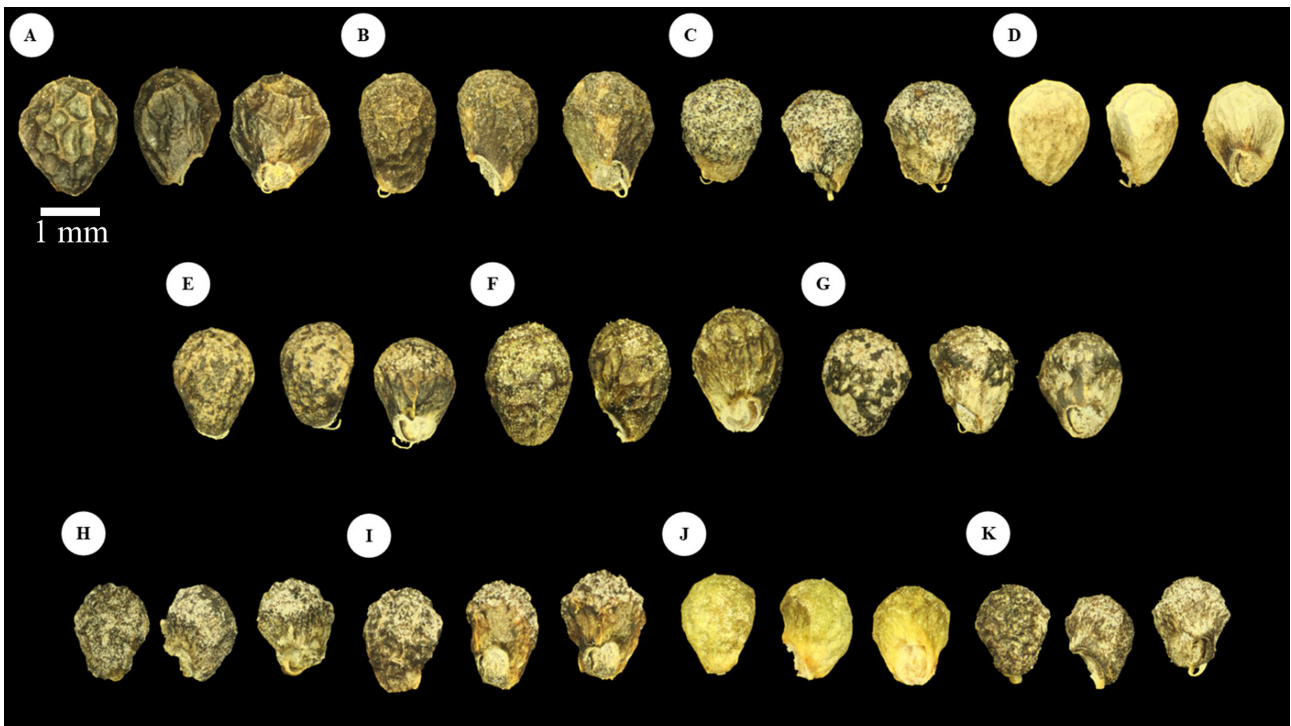


FIGURE 2. Detail of the nutlets of *Trichostema* section *Trichostema*. A) *Trichostema dichotomum*, B) *T. setaceum*, C) *T. suffrutescens*, D) *T. nesophilum*, E) *T. floridanum*, F) *T. fruticosum*, G) *T. latens*, H) *T. bridgesii-orzellii*, I) *T. gracile*, J) *T. hobe*, K) *T. microphyllum*. *Trichostema dichotomum* (A) shows large alveoli and tall ridges. *T. latens* (G) shows small alveoli and shorter ridges. Photos by Derick Poindexter.

Date of flowering from 1626 herbarium specimens, collected vouchers, and 2168 verified observations from iNaturalist were recorded as year-day offset by three months (i.e., 1 March=1; 28 February=365). Flowering time was visualized using ggplot2 (Wickham 2016). Seeds were sown in a mixture of peat, sand, and perlite, and germinated in a

climate-controlled greenhouse. Young cymes/verticils were collected from flowering individuals in the greenhouse and fixed in Carnoy I (1 part glacial acetic acid : 3 parts 95% ethanol) solution for 24 hours. These were then transferred to 70% ethanol and stored in a -20°C freezer for long-term storage. To perform the chromosome squash, anthers were extracted from *ca.* three flowers at a time, stained with acetocarmine using an oxidized iron needle probe to intensify staining, and squashed in Hoyer’s mounting medium. Multiple cells at metaphase were then isolated with a trinocular Leica phase contrast microscope at 1000x magnification and chromosomes were counted by sight.

DNA extractions were performed on leaf tissue samples from silica dried leaf samples, herbarium specimens, and greenhouse plants using a modified Qiagen DNeasy protocol (Poindexter 2019). These DNA samples were sent to SNPsaurus for nextRAD processing following Russello *et al.* (2015). Genomic DNA was fragmented with Nextera reagent (Illumina, Inc.) and then amplified using selective PCR primers. The genotyping analysis used custom scripts (SNPsaurus, LLC) that created a de novo reference from abundant reads present more than 65 times across the combined set of samples, and then mapping all the reads to the reference with an alignment identity threshold of 90% (BBMap, <http://sourceforge.net/projects/bbmap/>). Genotyping was done using Samtools and bcftools (samtools mpileup -gu -Q 10 -t DP,DPR -f ref_trichostema.fasta -b sample_list | bcftools call -cv -> trichostema.vcf) and loci filtered with vcftools. The PHYLIP format file was generated by concatenating the full-length loci sequence and then editing in genotype calls for each sample. Samples with fewer than 1 million high quality reads were removed from the alignment prior to phylogenetic analyses.

Phylogenetic analyses were run on the resulting alignment using BEAST v2.7.4 and associated software (Bouckaert *et al.* 2019) using a strict clock with mean clock rate of one and Yule model with birth rate prior set to the default value. The substitution model and mutation rate were estimated with the use of bModelTest (Bouckaert & Drummond 2017) with the proportion of invariable sites, rates, frequencies, and gamma shape priors all kept at their default settings. Based on preliminary runs, a pre-burn in of 2,500,000 generations was used since it consistently took the model 1,500,000 to 2,000,000 generations to reach an initial state of stationarity. After the pre-burn in, the model ran for 100,000,000 generations sampling after every 1000. A maximum clade credibility (MCC) tree was constructed from the resulting 100,001 trees using TreeAnnotator with 10% burn in and visualized and annotated using FigTree v1.4.3 (Rambaut 2016).

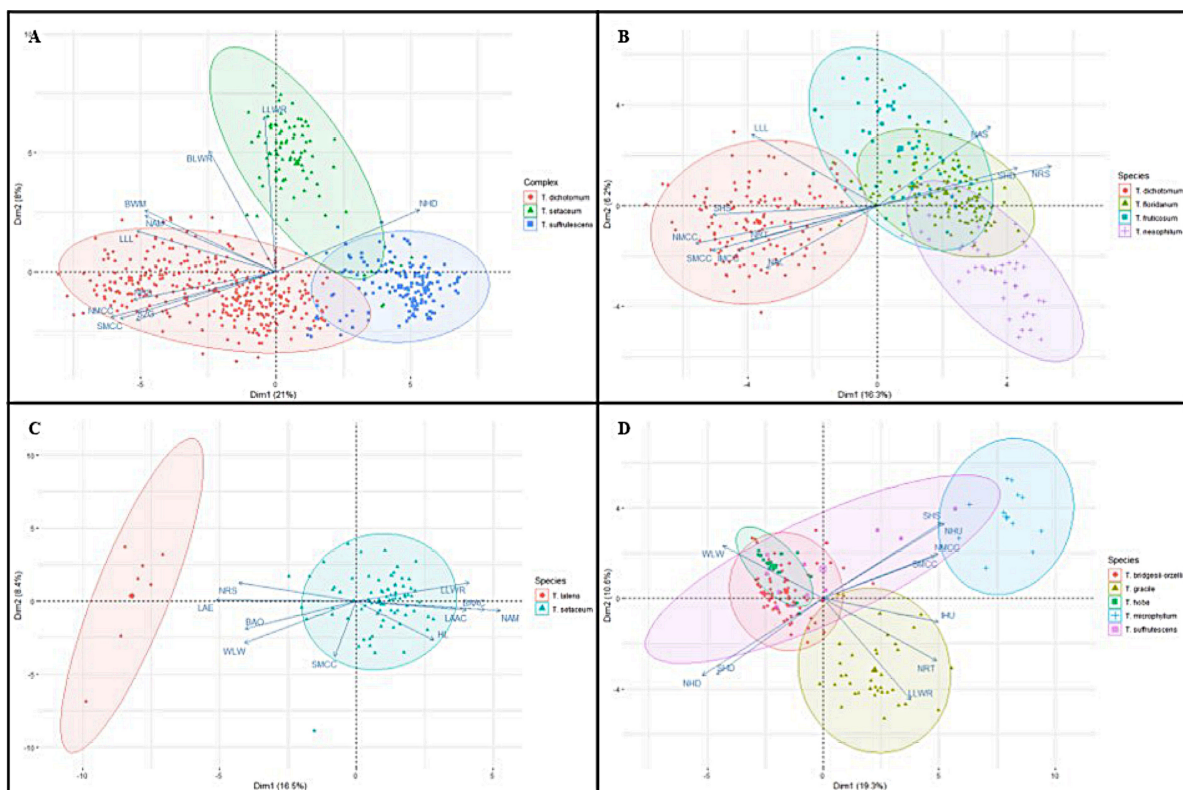


FIGURE 3. PCAs with greatest separation among the 95% confidence ellipses. The top ten contributors to the PCA are shown as arrows. A) PCA using all species and the “all characters no style” dataset with datapoints colored by species complex. B) PCA using the species from the *Trichostema dichotomum* complex and the “all characters no style” dataset with datapoints colored by species. C) PCA using the species from the *Trichostema setaceum* complex and the “all characters no style” dataset with datapoints colored by species. D) PCA using the species from the *Trichostema suffrutescens* complex and the “all characters no style” dataset with datapoints colored by species.

Results

The field work data suggested the presence of eleven distinct taxonomic entities in *Trichostema* section *Trichostema* identifiable by morphology, ecology, geographic range, and phenology. We base our concept of “distinct taxonomic entities” on the combined and synthesized application of all available evidence—morphology, gene sequences, habitat, phenology, and biogeography. Four of these entities corresponded to the four currently recognized species in this section. Significance tests showed significant differences among most species in all quantitative characters analyzed (McClelland 2022). Moderate morphological separation was found among species using PCAs (Figure 3). These differences were often found in the orientation and size of stem trichomes (Figure 1) and the ornamentation of the nutlets (Figure 2).

Overall, every species had the largest number of flowering observations in the late summer through the fall with the southernmost species having their flowering times extend into the winter months (Figure 4). Several species also had occurrences of flowering in late winter and spring (March to May). Based on field observations, these early flowering events are not as prolific as the main fall flowering. While overlap exists in the flowering times of all species, those species not blooming year-round are offset by a few weeks from the other species in their complex, including locally co-occurring, sympatric, and parapatric populations.

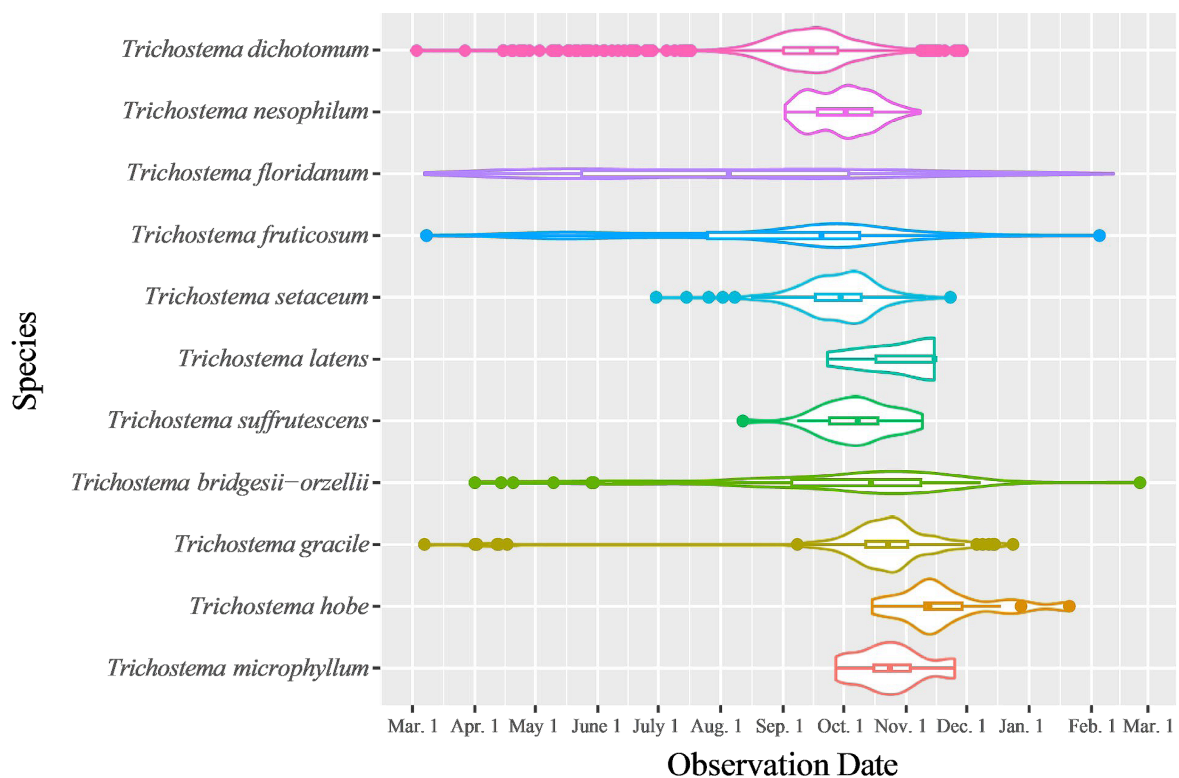


FIGURE 4. Flowering times of each species of *Trichostema* section *Trichostema*. All species show considerable overlap in flowering times. *Trichostema bridgesii-orzellii*, *T. gracile*, and *T. dichotomum* have documented flowering plants greatly outside of their main flowering season (March through May instead of July and later).

Plants in the common garden maintained their morphological distinctions. The first sets of leaves of all entities were abnormally large and some were crenate or lobed, likely due to the reduction of UV light in the greenhouse because of its tinted windows. Later leaves reverted closer to wild-type size and shape. A base chromosome number of $n=19$ was determined for three species.

The BEAST analysis provided robust support for the monophyly of section *Trichostema* (posterior probability [PP] = 1; Figure 5). Each taxonomic entity recognized from field data and morphological studies formed a strongly supported clade (PP = 1) in the genetic analysis, with one exception (Figure 5). An important result from the phylogeny was that the genetic data clarified the taxonomic identity of several populations. When vouchers from these populations were reassigned in the morphological analyses, it resulted in increased separation in the PCAs and greater significance in the significance tests. Furthermore, individuals from two sympatric and five parapatric populations of the taxonomic

entities were sampled for the genetic analysis. There were no intermediate plants seen at any of these sites and all sampled individuals formed clades with individuals sharing morphological and ecological similarities rather than the sympatric or parapatric taxon/a. The congruence among the morphological, ecological, geographical, and genetic data supports the recognition of these taxonomic entities as species following the general lineage concept and other modern species concepts (de Quieroz 1998).

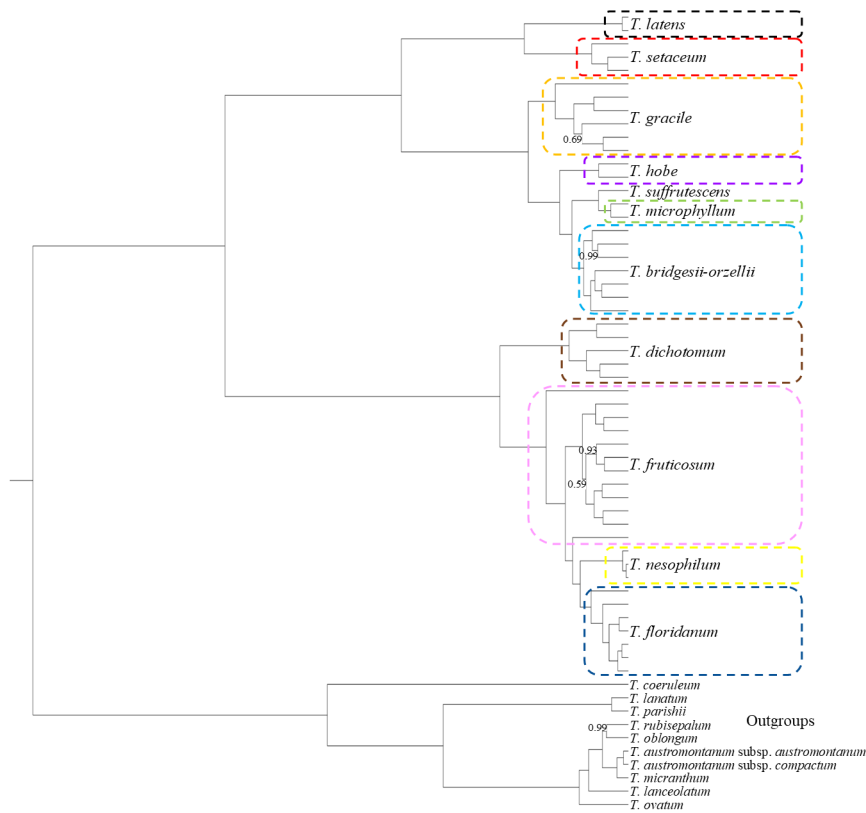


FIGURE 5. MCC Phylogeny of *Trichostema* section *Trichostema*. Species are highlighted using hashed boxes. Branch PP values are 1 unless otherwise provided. *Trichostema coeruleum* and members of sections *Chromocephalum* and *Orthopodium* are used as outgroups.

Taxonomic treatment

Notes on treatments:—Characters were measured from herbarium specimens with the exception of plant height, overall plant habit, and flower color, which were documented from field sites and iNaturalist observations. Quantitative characters are reported as “(minimum measured value)–average minus one standard deviation–average plus one standard deviation(–maximum measured value)” followed by the average. Qualitative character traits were included in the species description only if they were present on more than five percent of measured specimens. Qualitative characters that occurred on 33%–66% of specimens are defined as “occasional” and those that occurred on 5%–33% of specimens are defined as “rare.” If multiple character states for a qualitative character are provided (e.g., “leaf apices acute, occasionally $\pm 90^\circ$ or obtuse”), the first character state listed is the most common on the specimens measured. Exceptions to this are the colors of buds, open petals, and anthers, which are listed from darkest to lightest colors.

Trichostema floridanum K. S. McClell. and Weakley, *sp. nov.* (Figures 6 and 7)

Diagnosis:—Compact bushy perennial to 1 m tall, morphologically most similar to *Trichostema dichotomum*. It differs from *T. dichotomum* by being a short-lived perennial (vs. annual), its shorter leaves of 1.65–3.28 cm long (vs. 2.58–4.78 cm), smaller leaf length/width ratio of 2.4–3.63 times long as wide (vs. 3.38–4.92), lack of spreading trichomes more than 6–7 cells long on the stems and at nodes (vs. presence of spreading trichomes more than 6–7 cells long on the stems and at nodes; Figure 1), nutlets with short ridges and small to mid-sized alveoli (vs. mid-sized to tall ridges and mid-sized to large alveoli; Figure 2), year-long flowering time (vs. July–November), and restriction to calcareous coastal or near coastal habitats (vs. generalist on semi-mesic to semi-xeric substrates).

Type:—U.S.A. Florida. St. Lucie County. Openings in coastal strand/hammock, Fort Pierce Inlet State Park. Along main road through park and around headquarters parking lot, 27.474711°N, 80.294661°W, 5 August 2017, R. Kevan Schoonover, II, and Robert K. Schoonover 93a-1 (holotype NCU!; isotypes F!, FLAS!, K!, GH!, MO!, NCU!, NY!, P!, UC!, US!, USF!). Note: Specimens R. Kevan Schoonover, II, 93a-1 represent a single gathering in accordance with Article 8.2 of the ICN (Turland *et al.* 2018).



FIGURE 6. Type specimen of *Trichostema floridanum* *in situ*. R. Kevan Schoonover McClelland's leg for scale (ground to top of knee \approx 62 cm). Photo by Robert Schoonover.

Bushy perennial to 1 m tall; branching throughout the plant; stem hairs downwardly curved, rarely spreading to three, rarely to six, cells long (Figure 1e), with sessile glands and occasionally stalked glands to two cells long, rarely to three cells long (including gland); node hairs spreading, rarely downwardly curved, to four, rarely to six, cells long (Figure 1e); leaves widest towards the base, occasionally widest near the middle or towards the tip, $(1.1-1.65-3.28(-4.9)) \times (0.41-0.56-1.11(-2))$, average of 2.46×0.83 cm, $(1.85-2.4-3.63(-5))$, average of 3.01, times long as wide, base cuneate to attenuate, margin entire, apex obtuse, rarely rounded, acute, or $\pm 90^\circ$; inflorescence hairs spreading to upwardly curved, to three, rarely to four, cells long, with sessile and spreading glands to two, rarely to three, cells long (including gland); bracts widest towards the tip, occasionally widest near the middle, rarely widest towards the base, rarely falcate, $(2.8-4.6-8.31(-14.1)) \times (0.5-1.01-2.26(-3.8))$, average of 6.45×1.64 , mm, $(2.04-3.1-5.28(-9.6))$, average of 4.19, times long as wide, base cuneate to attenuate, margin entire, apex acute, rarely $\pm 90^\circ$; fruiting calyx $(5.1-5.72-6.74(-7.5))$, average of 6.23, mm long; buds dark blue-purple to light blue-purple, corolla dark to light blue or blue-purple; anthers dark to light blue or blue-purple; style bifid, the longer arm 1–2 times as long as the shorter; mature nutlets alveolate, $(1.2-1.61-1.91(-2.2))$, average of 1.76, mm long, hilum $(0.4-0.46-0.63(-0.8))$, average of 0.55, mm long, $(0.21-0.27-0.36(-0.44))$, average of 0.31, times the length of the nutlet, alveoli small, occasionally mid-sized, ridges short, occasionally mid-sized (Figure 2e); $2n = 38$.

Phenology:—Flowers and fruits all year.



FIGURE 7. Holotype specimen of *Trichostema floridanum*. Photo by R. Kevan Schoonover McClelland

Etymology:—The epithet *floridanum* (Latinization of the place name Florida) is given to this species because of its restricted range: all populations of this species occur in Florida except for a single known population on the island of Grand Bahama. The common name Florida coastal Bluecurls is given to this species for the same reasons.

Habitat and distribution:—*Trichostema floridanum* occurs in various open, calcareous environments in coastal and near coastal localities along the Florida peninsula (Figure 8). Some examples from barrier islands are openings in coastal strand, maritime hammock, shell mounds, and more protected areas of coastal grasslands. Near coastal examples are pine rockland, roadsides bedded with shell, and Florida scrub with calcareous influences.

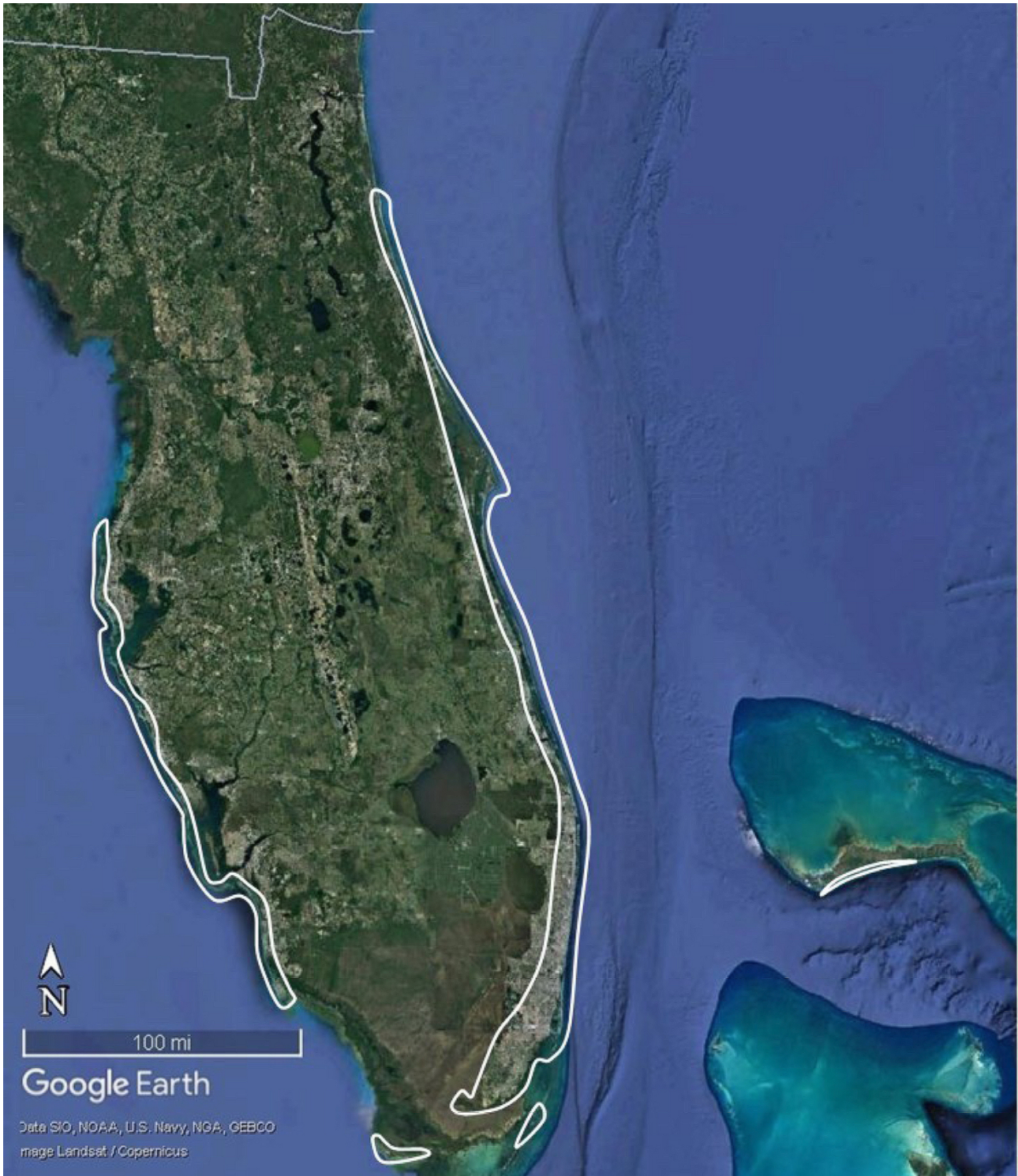


FIGURE 8. Approximate range of *Trichostema floridanum* based on field data and herbarium records.

Conservation status:—This species faces similar threats to *T. nesophilum* as they occupy very similar habitats. Hurricanes, rising sea levels, and increased urbanization of the coastline all threaten this species and its narrow range. Fortunately, there are many protected lands that hold sizeable populations of this species and it is very common in its range. Based on the data collected for this study, this species should be recognized at a G3 ranking (NatureServe 2020).

Additional specimens examined (paratypes):—BAHAMAS. Grand Bahama, East Grand Bahama County: beach area at Pelican Point., 6 November 1973, *Correll 40570* (FTG!); back of Pelican Point beach., 15 August 1974, *Correll & Kral 42851* (FTG!); U.S.A. Florida, Brevard County: North side of Sebastian Inlet State Park, 15 September 1977, *Carlton s.n.* (USF!); Merritt Island: across road from State Fish & Game Biology Lab., 13 October 1973, *Long, Wunderlin, Peppleton, Todd & Shuey 4011* (NCU!, USF!); Sebastian Inlet State Park, 27.868350 N, 80.45186389 W, 9 August 2017, *McClelland & Schoonover 99* (NCU!); Cape Canaveral; area adjoining fence surrounding Pad 41 (Titan complex in vicinity of False Cape), 7 February 1975, *Poppleton M1608* (FTU!); St. Sebastian River State Buffer Preserve: Coraci peninsula, 27.831583 N, 80.509306 W, 21 September 2001, *Savoie 48* (FLAS!); Merritt Island National Wildlife Refuge, 28.672908 N, 80.65752778 W, 11 August 2017, *Schoonover, II, & Schoonover 101* (NCU!); Broward County: in New River Grove Hammock, 4 miles west of Ft. Lauderdale, 30 July 1936, *Correll 6122* (NCSC!); Hugh Taylor Birch State Park. Ft. Lauderdale., 19 April 1966, *Lakela & Long 29648* (USF!); near South Fork of New River, n. of S.W. 12th St., s.w. Fort Lauderdale, 19 December 1963, *Roestad s.n.* (FLAS!); Charlotte County: SE1/4, SE 1/4, NE 1/4, S4, T42S, R20E, 26.850788 N, 82.305627 W, 14 May 1999, *Braem DP0076* (USF!); Gasparilla Island, 0.7 mi. N of Lee Co. Line along FLA 775; 2.1 mi. S of Gasparilla toll booth., 16 November 1979, *Hansen & Richardson 6810* (USF!); Don Pedro Island State Park, 26.845025 N, 82.30139167 W, 7 June 2018, *McClelland 129* (NCU!); Stump Pass Beach State Park, 26.904856 N, 82.34679722 W, 7 June 2018, *McClelland 130* (NCU!); Collier County: Delnor-Wiggins Pass State Park: Parkig area #3. NW 1/4 NE 1/4 SW 1/4 S20 T48S R25E, 26.278367 N, 81.828401 W, 5 December 2002, *Bishop DW0016* (USF!); of Wiggins Pass State Park, 17 September 1977, *Carlton s.n.* (USF!); Park Shore Drive US 41 Scrubs (Coll15). Secs 21 & 22, T49S, R25E (Naples North Quad). Along US 41, 26.188376 N, 81.800053 W, 20 February 1986, *Huck & Christman 3479* (FLAS!, USF!); North Naples, 5 March 1967, *Lakela 30663* (FLAS!, USF!); Marco Island, beach, Gulf of Mexico, 27 September 1964, *Lakela 27508* (USF!); Isle of Capri; Gulf of Mexico shore., 21 November 1966, *Lakela 30335* (USF!); Marco Island, 21 April 1967, *Lakela & Almeda 30790* (USF!); Sandbar southeast of Cape Romano, 16 August 1967, *Lakela & Barilotti 31027* (USF!); Tigertail Beach County Park, 25.943561 N, 81.74106944 W, 4 June 2018, *McClelland 124* (NCU!); Naples, 24 September 1937, *Scull s.n.* (FLAS!); Cape Romano, 28 August 1922, *Small, Small & DeWinkeler 10624* (US!); Vicinity of Marco [Island], 25 February 1916, *Standley 12722* (US!); Flagler County: Gamble Rogers Memorial State Park, 29.437639 N, 81.10959167 W, 12 August 2017, *McClelland & Schoonover 102a* (NCU!); Gamble Rogers Memorial State Park, 29.437839 N, 81.11122222 W, 12 August 2017, *McClelland & Schoonover 102b-c* (NCU!); Flagler Beach, Fla., 21 October 1999, *Stalter 22* (USCH!); Hillsborough County: N end of Egmont Key, 2 June 1978, *Crewz, Mortellaro & Kutash 1395* (USF!); Indian River County: Vero Beach Fla., 11 January 1927, *Beardslee s.n.* (MU!); Vero Beach, 24 April 1949, *Brass 20428* (US!); Indian Lane, w. side of Indian River Shores, 4 August 1968, *D’Arcy 2867* (FLAS!); just north of Vero Beach, 28 December 1940, *Deam 60230* (NCSC!); Sebastian Inlet State Park, 27.852047 N, 80.45291944 W, 9 August 2017, *McClelland & Schoonover 98* (NCU!); Near Roseland, 0.6 mi. S of Brevard Co. 110th St., 26 November 1978, *Wunderlin & Beckner 6501* (USF!); Lee County: Lovers Key State Park: S11 T47S R24E, 26.394628 N, 81.873254 W, 19 September 2002, *Bishop LK0059* (USF!); Gasparilla Island State Park: Lighthouse and dock area, 19 October 1999, *Braem GI0131* (USF!); Ft. Myers Beach, 7300 Estero Blvd., 19 June 1985, *Brown s.n.* (USF!); western Sanibel Island, 8 November 1966, *Brumbach 5598* (FLAS!); on a sand dune, western Sanibel Island, 31 March 1965, *Brumbach 5065* (NCU!); Western Sanibel, 22 October 1975, *Brumbach 8839* (NCU!, US!); Lower Captiva, 15 June 1977, *Brumbach 9266* (NCU!, US!, USF!); Flora of Sanibel Island Florida Hammock [map on label with red dot marking position], 30 April 1954, *Cooley 2642* (NCU!, USF!); just back of beach, northeast end of Sanibel Island, 30 October 1978, *Correll & Correll 50299* (FTG!, NCU!); Sanibel Island., 18 September 1968, *Craighead s.n.* (FTG!); on Black Island near Carlos Pass, 17 November 1969, *Craighead s.n.* (FTG!); Bonita Beach, Bonita Springs, March 1965, *Foster s.n.* (NCU!); 3 mi. from Boca Grande Causeway 100 yds to left, 26 November 1978, *Fulton 268* (USF!); 150 yards in from Bowman’s Beach on Sanibel Island., 27 December 1967, *Keller 768* (USF!); Sanibel Island., 8 November 1970, *Leonard 4467* (NCU!); Gasparilla Island State Park, 26.733553 N, 82.26120556 W, 6 June 2018, *McClelland 128* (NCU!); Bowman’s Beach Park, 26.463983 N, 82.16415833 W, 5 June 2018, *McClelland & Evans 125* (NCU!); Bowman’s Beach Park, 26.462447 N, 82.15309722 W, 5 June 2018, *McClelland & Evans 126* (NCU!); Frannie’s Preserve SCCC, 26.429003 N, 82.04775833 W, 5 June 2018, *McClelland & Evans 127* (NCU!); N. Captiva Island., 17 October 1977, *Morrill & Harvey 4* (USF!); Cayo-Costa Island ... behind A. Pine South., 8 January 1991, *Phillips, Crandall & Herwitz 357* (USF!); on Captiva Island., 16 October 1969, *Radford 45601* (NCU!); Captiva Id, Fla., 21 May 1901, *Tracy 7659* (CM!, US!); Sanibel Island, J. N. “Ding” Darling National Wildlife Refuge. 0.7 mi. SE from W end of Refuge property, 2.7 mi. SE of Wulfert (Blind Pass) along Sanibel-Captiva Road, 28 October 1978, *Wunderlin, Arcuri & Hansen 6143* (FTG!, USF!); Manatee County: Growing on old Indian mound Bayside. Longboat Key, Fla., 27 December 1915, *Reasoner s.n.* (NCU!); Manatee, Florida, 1845, *Rugel s.n.* (FLAS!); Manatee River,

September 1845, *Rugel 424* (FLAS!, USF!); an der Mundung des Manatee Rivers [at the mouth of the Manatee Rivers], June 1845, *Rugel 221* (USF!); Martin County: Jonathan Dickinson State Park, 27.019050 N, 80.11272222 W, 4 August 2017, *McClelland & Schoonover 91* (NCU!); Martin County: Jonathan Dickenson State Park, 9 June 1990, *Woodbury s.n.* (FTG!); Located in Jonathan Dickinson State Park (picnic area)., March 1988, *Woodbury & Roberts s.n.* (USF!); Miami-Dade County: wild area at n. end of Key Biscayne; S21, T54S, R42E, 25.726481 N, 80.152665 W, 2 January 1973, *Avery 1345* (FLAS!, NCU!, USF!); at S.W. 91 Ave and SW. 78 St. [Miami, Florida?], 13 October 1968, *Avery 489* (FTG!); Old Cutler Rd. about 1/2 mi. S. of Coco Plum Plaza, 18 April 1965, *Bellenger 160* (FTG!); Miami. Florida., 23 June 1935, *Buswell s.n.* (FTG!); Miami. Florida., 14 May 1934, *Buswell s.n.* (FTG!); Miami. Florida., 8 November 1936, *Buswell s.n.* (FTG!); west of Old Cutler Road just south of Cutler Hammock and canal, 15 September 1973, *Correll & Correll 40061* (FTG!); Cutler Hammock on Biscayne Bay., 16 April 1976, *Correll, Correll & Popenoe 47059* (FTG!, NCU!); Miami, Fla., 1906, *Cowles 256* (MU!); Key Biscayne Beach, 2 November 1965, *Craighead s.n.* (USF!); Key Biscayne [dot on map is on Key Largo], 4 June 1966, *de Boer 49* (USF!); Miami Beach, 12 February 1932, *Demaree 10221* (US!); along SW 72 Ave. [Miami, Florida?], 10 July 1971, *Fanning & McMahon 153* (FTG!); Crandon, Park Beach, Biscayne Bay., 21 April 1952, *Field & Lazar s.n.* (US!); Key Biscayne, Cape Florida State Park., 1 December 1968, *Gillis 7225* (FLAS!, FTG!, USF!); Key Biscayne, Cape Florida State Park., 21 March 1969, *Gillis 7702* (FTG!, NCU!); Intersection of SW 67 St. and SW 75 Ct. Miami. Dade County, 9 March 1975, *Hill 2540* (FTG!); northeast of intersection of 72 Ave and Bird Rd, new park. Miami., 31 May 1975, *Hill 3064* (NCU!); by US 1 at Perrine, 19 September 1973, *Kral 51862* (NCSC!); North end of Crandon Park on Key Biscayne, Dade Co., Fl., 17 May 1989, *Lippencott & Keller 1003* (FTG!); Key Biscayne Air Line Rd. across from ditch, 17 April 1937, *McAllister 250* (DUKE!); Bill Baggs Cape Florida State Park, 25.667569 N, 80.15561944 W, 2 August 2017, *McClelland & Schoonover 88* (NCU!); Edge of Cutler Hammock, S.W.176th St., off Old Cutler Rd., 12 January 1974, *Meagher 1115* (FTG!); In Arch Creek Hammock, Dade Co., Fla., 11 January 1930, *Moldenke 395* (DUKE!); Brickell Hammock, Miami, 28 April 1930, *O'Neill s.n.* (US!); Miami, 4 April 1898, *Pollard & Collins 215* (US!); Hammocks near the Miami River, 20 December 1913, *Small & Small 4499* (NCU!); Arch Creek Prairie, Dade County, 3 July 1915, *Small, Mosier & Small 6781* (DUKE!, FLAS!); East of highway and north of Crandon Park Recreational Area on the northern end of Key Biscayne., 26 January 1964, *Stimson 53* (DUKE!); Key Biscayne. Northern end of the island. East of the highway and north of Crandon Park Recreational Area., 26 January 1964, *Stimson 86* (DUKE!); Coral Reef County Park, at intersection of 146th St. and 80th Ave. in Rockdale N of Perrine, Miami., 24 July 1990, *Tan & Raymond CR31* (FLAS!); Coral Gables, pinelands on limestone near University of Miami campus, 30 August 1959, *Webster 9994* (DUKE!); North hammock area of Key Biscayne, near beach., 4 June 1966, *Whitney 10* (NCU!); Church property of 5 acres ... at 8701 SW 124 Street., April 1964, *Woessner s.n.* (FTG!); Monroe County: North of Key Largo, December 1929, *Jennings & Jennings s.n.* (CM!); East Cape Sable., 28 June 1970, *Meagher, Long & Utley 342* (USF!); Palm Beach County: West Palm Beach, 1 October 1913, *Lidstrom 6991* (US!); North of Singer Island, 1 May 1943, *Lonsing s.n.* (MU!); Singer Island, three miles south of Lost Tree Village., 26 October 1969, *McCart 11164* (FLAS!); John D. MacArthur Beach State Park, 26.825103 N, 80.04304444 W, 3 August 2017, *McClelland & Schoonover 89* (NCU!); Lake Worth, August 1925, *O'Neill 868* (US!); Pinellas County: Honeymoon Island State Park: S8 T28S R15E, 28.061715 N, 82.824174 W, 29 September 2004, *Braem HI0119* (USF!); Sunset beach; Clearwater, 8 August 1940, *Crevasse s.n.* (FLAS!); Honeymoon Island Recreation Area. Little Bayou. SE entrance S of ranger's mobile home, shore area to embankment ca. 75 m W., 23 September 1979, *Fleming & Genelle 3215* (USF!); Caladesi Island State Park, 24 August 1973, *Fowler 161* (USF!); Caladesi Island State Park, 27 October 1973, *Fowler 204* (USF!); Honeymoon Island, 10 July 1970, *Genelle & Fleming 287* (USF!); Fort DeSoto Park. South of Gulfport, Gulf of Mexico. Mullet Key, 2 November 1963, *Lakela, Lassiter & Lassiter 26627* (FLAS!, USF!); Fort De Soto County Park, 27.616025 N, 82.73639722 W, 9 June 2018, *McClelland 134* (NCU!); Caladesi Island State Park, 28.031428 N, 82.82075833 W, 23 June 2018, *McClelland & Schoonover 136* (NCU!); Honeymoon Island State Park, 28.068431 N, 82.83019444 W, 23 June 2018, *McClelland & Schoonover 135a* (NCU!); Honeymoon Island State Park, 28.068431 N, 82.83019444 W, 23 June 2018, *McClelland & Schoonover 135b* (NCU!); Treasure Island, 18 December 1942, *Perkins s.n.* (USF!); Caladesi Island State Park: At the area of the old tower base., 14 October 2001, *van Hoek CI0143* (USF!); Sand flat on the west coast of Honeymoon Island, Pinellas Co., Fla., 2 June 1963, *Wagner 855* (DUKE!); Sarasota County: about 4 mi. n of s. end of Casey Key, 22 April 1967, *Beckner 1689* (FLAS!); between the beach road and intercoastal waterway, Casperson's Beach, Venice, 21 August 1975, *Dennis 51901* (NCSC!); Longboat Key., 20 November 1964, *Godfrey 65261* (FLAS!); Longboat Key., 24 October 1964, *Lakela 29353* (USF!); Longboat Key, south end ... overlooking Gulf of Mexico., 6 October 1964, *Lakela & Long 27551* (USF!); Manasota Key, 12 May 1967, *Long, Broome, Almeda, Utley & Pardue 2574* (USF!); St. Johns County: Driveway to Paul Gabrielson's beach house, south of St. Augustine, 29.727883 N, 81.238303 W, 13 August 2016, *Gabrielson s.n.* (NCU!); Fort Matanzas

National Monument: St. Augustine Beach; southern Anastasia Island, east side FL A1A, along boardwalk over dunes to Atlantic Ocean., 26 September 2003, *Giannasi, Zomlefer & Bettinger 485* (GA!); Fort Matanzas National Monument: St. Augustine Beach; southern portion of park property on Rattlesnake island, near parking area., 31 July 2003, *Giannasi, Zomlefer, Bettinger & Kruse 421* (GA!); Fort Matanzas National Monument: St. Augustine Beach; northern Rattlesnake Island, north of Fort Matanzas., 29 July 2003, *Giannasi, Zomlefer, Bettinger, Dean, Judd & Kruse 249* (GA!); Fort Matanzas National Monument, 29.703725 N, 81.23383056 W, 24 September 2018, *McClelland 180* (NCU!); Anastasia State Park, 29.878606 N, 81.28509444 W, 24 September 2018, *McClelland 181* (NCU!); St. Lucie County: Savannas Preserve State Park, 27.306822 N, 80.26109167 W, 10 November 2018, *McClelland 205* (NCU!); Fort Pierce State Park, 27.474711 N, 80.29466111 W, 5 August 2017, *McClelland & Schoonover 93* (NCU!); Along St. Lucie River [assuming it is near Port St. Lucie], 4 September 1929, *O'Neill s.n.* (US!); ca. 1 mi. n. of Ft. Pierce Inlet, 9 August 1965, *Ward & Crosby 5049* (FLAS!, USF!); Volusia County: New Smyrna Fla, March 1925, *Beardslee s.n.* (MU!); Tomoka State Park, 7 miles north of Daytona Beach, Fla., 28 December 1960, *Blomquist s.n.* (NCU!); at Target Rock; following edge of Mosquito Lagoon. Canaveral National Seashore, 27 January 1979, *Kirkman 1050* (WILLI!); along dike roadway that runs around land that juts into Mosquito Lagoon between Cat Hammock and Lone Palm; Canaveral National Seashore, 9 February 1979, *Kirkman & Ware 1136* (WILLI!); Tomoka State Park; Helicopter Island, ca. 1.1 km due N of the Old Dixie Highway bridge at the Tomoka River, 29.351417 N, 81.086667 W, 1 October 2004, *Kunzer 662* (USF!); Turtle Mound Monument, about 9 miles south of New Smyrna Beach. Margin of shore trail., 4 November 1962, *Lakela 25548* (USF!); North Peninsula State Park, 29.422817 N, 81.102725 W, 28 August 2017, *McClelland 104* (NCU!); Tomoka State Park, 29.340553 N, 81.08291944 W, 24 September 2018, *McClelland 179* (NCU!); ca. nine miles south of New Smyrna Beach just north of Turtle Mound; on stabilized sand behind dune ridge of ocean beach., 27 April 1961, *Ray, Jr., Wood, Smith, & Eaton 10808* (NCU!, USF!); Cape Canaveral National Seashore. Ca 6 miles south of New Smyrna Beach., 11 June 1982, *Redfearn 33001* (WILLI!); Canaveral National Seashore, North Merritt Island, Parking Lot #1, 16 July 1991, *Seymore 07/608* (FTU!); N. Merritt's Isl.; Across the road (Rt. 3) from the field station., 10 October 1973, *Shuey M0313* (FTU!); N. Merritt's Isl.; due west of the field station lab (old chamber of commerce building), 10 October 1973, *Shuey s.n.* (FTU!); N. Merritt's Isl. Across the road (Rt 3) from the field station., 10 October 1973, *Shuey M0314* (USF!).

Trichostema fruticosum K. S. McClell., *sp. nov.* (Figures 9 and 10)

Diagnosis:—Compact to diffuse bushy perennial to 1.25 m tall, morphologically most similar to *Trichostema dichotomum*. It differs from *T. dichotomum* by being a short-lived perennial (*vs.* annual), its wider leaves of 0.74–1.6 cm (*vs.* 0.59–1.25 cm), smaller leaf length/width ratio of 2.89–4.42 times long as wide (*vs.* 3.38–4.92), lack of spreading trichomes more than 6–7 cells long on the stems and at nodes, (*vs.* presence of spreading trichomes more than 6–7 cells long on the stems and at nodes; Figure 1), nutlets with short to mid-sized ridges and small to mid-sized alveoli (*vs.* mid-sized to tall ridges and mid-sized to large alveoli; Figure 2), and year-long flowering time (*vs.* July–November).

Type:—U.S.A. Florida. Marion County. Restored Red Oak-Pine woodland, Mockernut Hill Botanical Garden, beside entrance gate, 16 October 2021, *R. Kevan Schoonover McClelland, Robert K. Schoonover, and Linda Duever 222a–w* (holotype NCU!; isotypes B!, BM!, F!, FLAS!, K!, G!, GH!, MEXU!, MO!, NCU!, NY!, OS!, P!, PH!, RSA!, UC!, US!, USF!). Notes: Specimens *R. Kevan Schoonover McClelland 222a–w* represent a single gathering in accordance with Article 8.2 of the ICN (Turland *et al.* 2018). Mockernut Hill Botanical Garden is a botanical garden oriented around land management training, showcasing trails through exemplary native vegetation rather than display gardens. The sampled population is one of many naturally occurring on the property and not of a horticultural origin.

Bushy perennial to 1.25 m tall; branching throughout the plant; stem hairs downwardly curved, occasionally spreading to three, rarely to five, cells long (Figure 1f), with sessile and stalked glands to two cells long, rarely to three cells long (including gland); node hairs spreading, rarely downwardly curved, to four, rarely to six, cells long (Figure 1f); leaves widest towards the base, occasionally widest near the middle, rarely widest towards the tip, (1.6–)2.82–5.4(–7.4) × (0.33–)0.74–1.6(–2.6), average of 4.11 × 1.17, cm, (2.19–)2.89–4.42(–6.06), average of 3.65, times long as wide, base cuneate to attenuate, margin entire, apex obtuse, occasionally ±90°, rarely acute or rounded; inflorescence hairs spreading to upwardly curved, to three cells long, with sessile and spreading glands to two, rarely to three, cells long (including gland); bracts widest towards the tip or near the middle, rarely widest towards the base, rarely falcate (3.9–)6.41–12.03(–16.6) × (0.7–)1.21–2.71(–4.6), average of 9.22 × 1.96, mm, (2.65–)3.55–6.41(–11.3), average of 4.98, times long as wide, base cuneate to attenuate, margin entire, apex acute, rarely acuminate; fruiting calyx (5.6–)6.24–7.65(–9.2), average of 6.94, mm long; buds dark blue-purple to light blue-purple, corolla dark to light blue or

blue-purple; anthers dark to light blue or blue-purple; style bifid, the longer arm 1–1.5, occasionally 2, times as long as the shorter; mature nutlets alveolate, (1.5–)1.71–2.06(–2.3), average of 1.88, mm long, hilum (0.4–)0.51–0.69(–0.9), average of 0.6, mm long, (0.24–)0.28–0.36(–0.44), average of 0.32, times the length of the nutlet, alveoli small to mid-sized, rarely large, ridges short, occasionally mid-sized (Figure 2f).



FIGURE 9. Type specimen of *Trichostema fruticosum* before pressing. R. Kevan Schoonover McClelland's foot for scale (heel to toe \approx 35 cm). Photo by R. Kevan Schoonover McClelland.

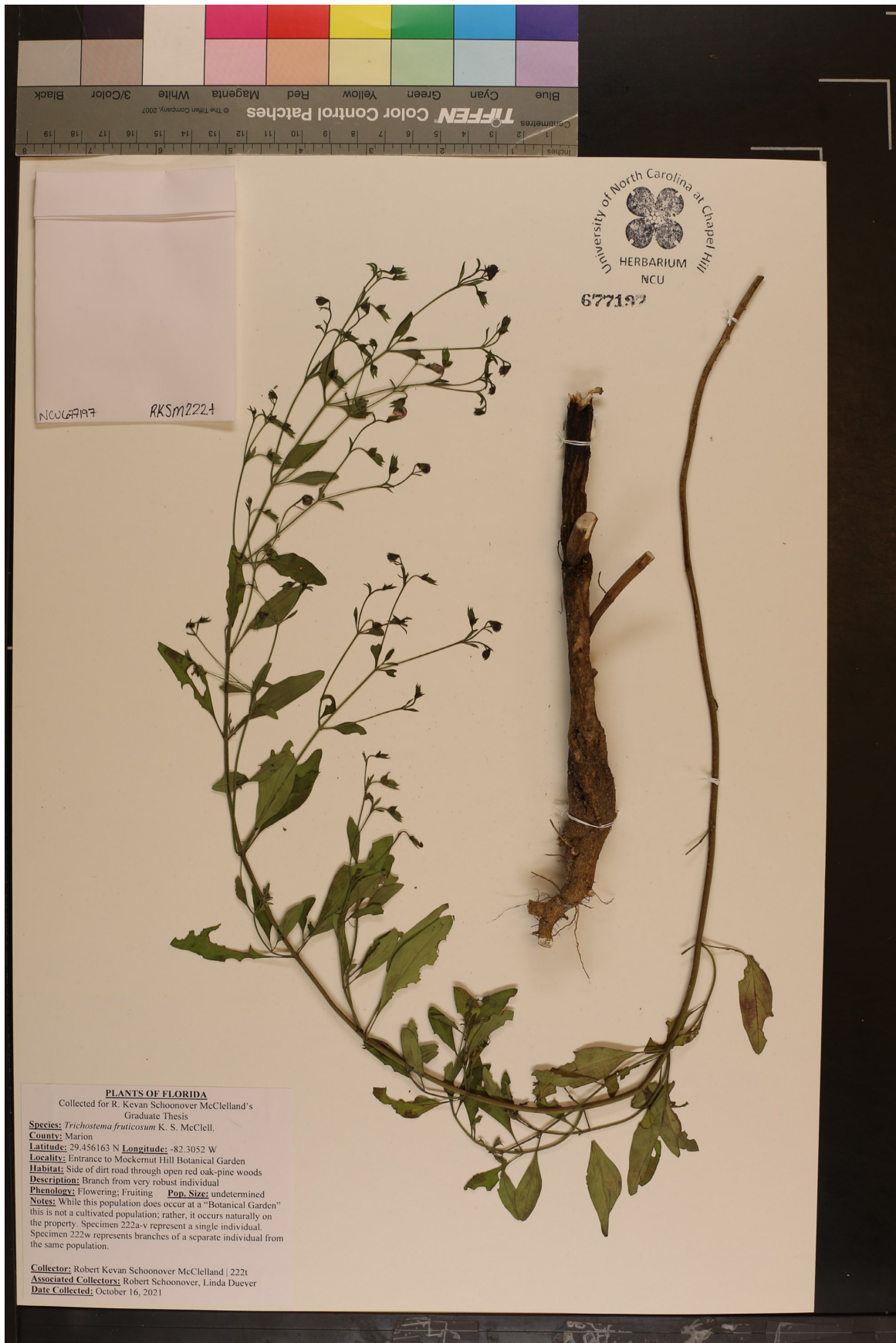


FIGURE 10. Holotype specimen of *Trichostema fruticosum*. Photo by R. Kevan Schoonover McClelland.

Phenology:—Flowers and fruits April to December. Some plants will have a small number of flowers January to March.

Etymology:—The epithet *fruticosum* (Latin, bushy) is given to this species based on its growth habit. It often has a woody base and forms a relatively large, much branched “bush” (to 1.25 m tall) compared to the typically smaller, more compact growth forms of *T. floridanum* and *T. nesophilum* and the more virgate branching of the members of the *T. suffrutescens* complex. The common name given to this species is Bushy Bluecurls. This is derived from the same feature as the specific epithet. The common name was suggested by Linda Duever, founder of Mockernut Hill Botanical Garden and co-collector of the type specimens.

Habitat and distribution:—*Trichostema fruticosum* occurs in openings in a variety of mesic to semi-dry habitats with or without calcareous influences on the mainland and some barrier islands; 0–100 meters; USA: Alabama, Florida, Georgia, Mississippi. (Figure 11).



FIGURE 11. Approximate range of *Trichostema fruticosum* based on field data and herbarium records.

Conservation status:—*Trichostema fruticosum*, while having a more restricted range than *T. dichotomum*, is much more widespread than *T. floridanum* and *T. nesophilum*, most likely due to its habitat tolerances. It is common throughout its range, and it has also been introduced to the nursery trade under the species name of *T. dichotomum*. Although it is widespread, many of its populations are coastal or near coastal and under threat from rising sea levels and hurricanes. Based on the data collected for this study, this species should be recognized at a G3 ranking (NatureServe 2020). Most of the populations of this species occur in Florida and thus it was calculated to have an S3 ranking in Florida. The smaller numbers of populations in Alabama, Georgia, and Mississippi led those states having an S2 rank calculated for this species (NatureServe 2020).

Notes:—*Trichostema fruticosum* was the only species not to form a clade in the BEAST analysis (Figure 5). The sample from Estero Bay (EstBPu) is sister to the clade containing *T. floridanum* and *T. nesophilum* and the sample from Mississippi (NCU 667421) diverges at the base of the perennial *T. dichotomum* complex clade in the MCC tree.

The reason for the incongruence in the placement of the Estero Bay specimen is likely due to its low number of high-quality reads mapped to the reference. This would explain why this specimen, which is geographically and morphologically distinct from *T. nesophilum*, is not in the clade with the rest of *T. fruticosum*. Thus, it is possible that the missing data would have aligned this specimen with the larger clade. This sample, though, based on its morphology, ecology, and biogeography still falls within the concept of *T. fruticosum*.

The Mississippi sample poses a different issue. Unlike the Estero Bay sample, this sample had a high number of high-quality reads mapped to the reference. However, like the Estero Bay specimen, this specimen was collected at the edge of the species range, this time at the far western edge. It could be that this specimen represents a separate taxon. If this were true, its potential extent is west of the Tombigee River and Mobile Bay, with the *T. fruticosum*-*T. floridanum*-*T. nesophilum* clade all occurring east of that demarcating line, a biogeographic pattern shown in other taxa (Soltis *et al.* 2006). Larger amounts of sampling would be needed to determine this. If it is recognized as a separate taxon, it would likely be morphologically cryptic relative to *T. fruticosum*. To increase taxonomic and nomenclatural stability, the type specimen for this species was selected from a population that always fell within the strongly supported clade of *T. fruticosum* near the center of the species' range.

Additional specimens examined (paratypes):—U.S.A. Alabama, Baldwin County: Montrose, 9 October 1967, *Kral 29784* (NCU!); Florida: Florida, 1897, *Chapman s.n.* (NCU!); Alachua County: San Felasco Hammock State Park, 29.715116 N, 82.460713 W, 7 September 2019, *Abair 424* (NCU!); outer zone-Devil's Millhopper; Gainesville, Florida, 4 October 1931, *Arnold s.n.* (FLAS!); Devil's Millhopper Geologic State Park, 29.705578 N, 82.39521389 W, 29 June 2018, *McClelland & Schoonover 150* (NCU!); 5 miles N of Alachua in Section 22, T7S, R18E on Townsend Branch of Mill Creek., 29.865622 N, 82.50574 W, 3 November 1983, *Simons & Hall s.n.* (FLAS!); Bay County: St. Andrews, s.d., *Beck 154* (FLAS!); Charlotte County: 4.5 mi SE of Sarasota/Charlotte Co. line on US 41. Coco Plum Waterway; canal and surrounding area., 22 August 1985, *Thompson & Nishida 2794* (CM!, USCH!); Citrus County: "The Cove", on Lake Tsala Apopka, 7 mi. n.e. of Floral City, 25 October 1966, *Beckner 1576* (NCU!); Fort Cooper State Park: E edge of lake; SE 1/4 SW 1/4 S27 T19S R20E, 28.802238 N, 82.299104 W, 20 November 1999, *Hattaway FC0050* (USF!); McGregor Smith Scout Reservation, 15 September 1983, *Hopkins 1859* (FTU!); Dixie Shores Trail, Crystal River, 28.878477 N, 82.614741 W, 16 October 2021, *McClelland & Schoonover 219* (NCU!); Hollins zone 16. Crystal River State Buffer Preserve, 6 October 2000, *Scanlon 17* (FLAS!); Collier County: in pastureland near seasonal lake, Kissimmee Billy, north of Alligator Alley., 2 May 1976, *Smiley s.n.* (FTG!); Duval County: Vicinity of cabin; Roosevelt Wildlife Preserve, 7 October 1975, *Harrison & Garren 65* (FLAS!); Roosevelt Wildlife Preserve -- 200 yards inside main gate., 25 September 1976, *Harrison & Garren 73* (FLAS!); Little Talbot Island State Park, 30.457417 N, 81.41862778 W, 29 September 2018, *McClelland 183* (NCU!); Timucuan Ecological and Historic Preserve - Theodore Roosevelt, 30.369639 N, 81.48503611 W, 30 September 2018, *McClelland 186* (NCU!); Escambia County: At the E edge of Pensacola, off the E side of Scenic Highway, at the Bayview Memorial Cemetery, 20 November 1983, *Wilhelm 11857* (USF!); Franklin County: near Apalachicola, Florida, 11 August 1876, *Anonymous s.n.* (US!); St. Vincent Island, Tahiti Point (NE end), 22 September 1983, *Christman s.n.* (FLAS!); St. James Bay Golf Course, just N of US 98, ca. 6 mi E of Carrabelle., 10 October 2005, *Hansen 13067* (USF!); near the Gulf of Mexico, at Alligator Point, 22 August 1967, *Henderson 67-1477* (GA!, NCU!, USCH!); St. Vincent Island, 30 October 1910, *McAtee 1744A* (US!); St. George Island State Park, 29.692044 N, 84.78745833 W, 14 July 2018, *McClelland & Schoonover 158* (NCU!); Intersection of Alligator Drive and Bald Point Road, 29.901653 N, 84.348771 W, 17 October 2021, *McClelland & Schoonover 223* (NCU!); Bald Point State Park, 29.910328 N, 84.36224444 W, 14 July 2018, *McClelland & Schoonover 157* (NCU!); ca. 1/2 mi. E. of St Teresa and next to Camp Weed on US 98., 18 October 1969, *Sullivan 1302* (NCU!); Gulf County: on road to Cape San Blas., 11 September 1977, *Crewz 1194* (FLAS!, USF!); Hardee County: Charlie Creek., ca. 7 miles E of Zolfo Springs, 23 July 1949, *Brass 20612* (FLAS!, US!); Cattle Range Station, Limestone, 1 July 1942, *Kirk s.n.* (FLAS!); CF Properties, USF Archaeological Site #8 Hr 11. Orchard-fenceline site, 10 mi W of Bowling Green., 24 July 1977, *Kuczynski s.n.* (USF!); in Payne Creek State Historic Site. 2 mi. SE of center of Bowling Green, on S side of Rd. 664A, W of Peace River, 15 June 1978, *Willson 213* (FTU!); Hendry County: Rt. 80, LaBelle, 8 March 1950, *Hood 3442* (FLAS!); Hernando County: s.w. side of Chinsegut Hill, ca. 3 mi. ne.e. of Brooksville, ne.e. corner of S3, T22S, R19E, 28.605294 N, 82.385651 W, 25 September 1965, *Beckwith s.n.* (FLAS!); McCarty Woods, ca. 0.5 mi. N of Brooksville., June 1989, *Krofta s.n.* (USF!); McCarty Woods, ca. 0.5 mi. N of Brooksville., 2 October 1986, *Krofta s.n.* (USF!); northwest of Brooksville, off US98., 22 September 1963, *Lakela 26478A* (USF!); Hillsborough County: Wilderness Park, on Morris Bridge Road, near the Hillsborough River, 3 September 1989, *DeVore 1013b* (MU!); Along Patterson Rd. near Odessa., 2 July 1963, *Ducey 49* (USF!); Hillsborough River State Park: N 1/2, SW 1/4, SE 1/4, NW 1/4, S8, T27S, R21E; Burn Zone HR-14; along Baynard Nature Trail, 28.15075 N, 82.231469 W, 7 July 1994, *Graham HR0049* (USF!); Hillsborough River State Park., 2 August 1966, *Lakela & Almeda 30121* (USF!); Beacon Key study site #12. Sec. 34 T32S R18E ... east of U.S. 41, 27.67392 N, 82.53593 W, 31 July 1974, *Todd 282* (USF!); Lake County: 4 miles south of Leesburg, 20 October 1968, *Baltzell 697* (FLAS!); Between Eustis & Leesburg Florida, 1 October 1933, *Buswell s.n.* (FTG!); S. edge Lake Dora, 1 November 1978, *Daubenmire & Daubenmire s.n.* (USF!); Eustis, Trout Lake Nature Center, 26 August 1989, *Daubenmire & Daubenmire s.n.* (USF!); Eustis, Trout Lake Nature Center, 19 November 1989, *Daubenmire & Daubenmire s.n.*

(USF!); 3 mi. SSW of Leesburg., 15 September 1990, *Daubenmire & Daubenmire s.n.* (USF!); Leesburg-Flat Island, 9 January 1991, *Daubenmire & Daubenmire s.n.* (USF!); Flat Island, SW of Leesburg, 15 November 2017, *Daubenmire & Daubenmire s.n.* (USF!); Entrance road to Flat Island Reserve, 28.781050 N, 81.892782 W, 16 October 2021, *McClelland & Schoonover 215* (NCU!); Lee County: [Fort] Myers, August 1900, *Hitchcock 279* (US!); Estero Bay Preserve, Estero River Scrub Unit, near Mullock Creek, 26.46727788 N, 81.8360699 W, 14 October 2021, *Horn s.n.* (NCU!); Salvista, Lee Co., Fla., 23 April 1930, *Moldenke 1075b* (DUKE!); Levy County: Waccasassa Bay State Preserve; Dewey Allen Park Road, northwest of junction with C-40 & C-40A; roadside., 29.036667 N, 82.733333 W, 30 September 1996, *Abbott 9600* (FLAS!); Vicinity of Cedar Key and along highway SR. 24 between Cedar Key and Otter Creek, 15 September 1971, *Carlton, Sreemadhavan, Lakela & Long 3348* (USF!); second island off the mouth of the Withlacoochee River., 16 September 1959, *Cooley, Eaton & Ward 6958* (USF!); Sea Horse Key near Cedar Keys, 16 November 1952, *Davis s.n.* (NCSC!); Cedar Key Train Trestle Nature Trail, 29.14357 N, 83.032334 W, 16 October 2021, *McClelland & Schoonover 220* (NCU!); North Key: an island in Cedar Keys National Wildlife Refuge; 2 mi W of Cedar Key., 29.12672 N, 83.08562 W, 8 April 2004, *Sprenkle & Judd 318* (FLAS!); Gulf Slope of Seahorse Key, 2 mi. s.w. of Cedar Key, 1 December 1962, *Ward 3254* (FLAS!); s. side of Fla. 40, w. of Yankeetown, ca. 1 mi. from end of road, 26 March 1962, *Ward & Tomlinson 2986* (FLAS!, USF!); Liberty County: at clearing above the Apalachicola River at Alum Bluff overview (ca. 2.0 mi N of Bristol), 30.46389 N, 84.98693 W, 12 November 2012, *Anderson 26803* (NCU!); at top of Alum Bluff, ca. 3 mi. n. of Bristol, S24, T1N, R8W, Liberty County., 10 November 1963, *Ward & Ford 3731* (FLAS!, NCU!); Manatee County: Bradentown, 25 June 1923, *Cuthbert s.n.* (FLAS!); At Palmetto, 21 August 1895, *Nash 2452* (FLAS!, US!); Marion County: near lake, Fla 42, 0.5 mi. e. of Linadale, 30 September 1973, *Baltzell 5360* (NCU!); Silver Springs State Park, 29.201458 N, 82.0389 W, 7 October 2018, *McClelland 191* (NCU!); Mockernut Hill Botanical Garden, 29.454400 N, 82.30558889 W, 28 June 2018, *McClelland, Schoonover & Duever 148a* (NCU!); Mockernut Hill Botanical Garden, 29.454958 N, 82.30566944 W, 28 June 2018, *McClelland, Schoonover & Duever 148b* (NCU!); Nassau County: Amelia City, 20 November 1941, *Knight s.n.* (FLAS!); Fort Clinch State Park, 30.702975 N, 81.45328889 W, 30 September 2018, *McClelland 185* (NCU!); Okaloosa County: Fred Gannon Rocky Bayou State Park, 30.498422 N, 86.42638333 W, 4 August 2018, *McClelland 166* (NCU!); Henderson Beach State Park, 30.384908 N, 86.44789722 W, 4 August 2018, *McClelland 165* (NCU!); Orange County: At Clarcona, 25 September 1899, *Meislahn 63* (US!); Pasco County: Werner-Boyce Salt Springs State Park, 28.291022 N, 82.71776944 W, 24 June 2018, *McClelland & Schoonover 137* (NCU!); Werner-Boyce Salt Springs State Park: Directly N of park shop, 5 September 2002, *van Hoek & Petty WB128* (USF!); Polk County: Colt Creek State Park; ca. 2.5 km SSE of FL 471 bridge over the Withlacoochee River, ca 5.1 km NNE jct. FL 471 and US 98., 28.293972 N, 82.045306 W, 26 September 2008, *Kunzer, Dauphin & Eckert 2530* (USF!); Colt Creek State Park, 28.277592 N, 82.03106944 W, 24 June 2018, *McClelland & Schoonover 139* (NCU!); Santa Rosa County: Gulf Islands National Seashore - Naval Oaks, 30.364872 N, 87.13128889 W, 5 August 2018, *McClelland 167* (NCU!); Sarasota County: Sarasota, off Linwood Avenue just south and east of junction with Vinson Street., 25 November 1995, *Abbott 8108* (FLAS!); Oscar Scherer State Park: Head of Green Trail near W edge of campground, 6 August 2003, *Bishop OS0059* (USF!); 3210 Old Oak Drive, Sarasota, FL, 23 September 1978, *Dodson 4836* (USF!); Churchill Ranch on Border Rd., part of Deer Prairie Creek Preserve, ca. 2.3 km ENE of jct. I-75 and C-777 (River Rd), 27.1175 N, 82.327778 W, 23 May 2007, *Franck 151* (USF!); Off Bahia Vista Rd. down a dirt road., 11 February 1976, *Gordon & Mack 21* (USF!); Oscar Scherer State Park, 27.170161 N, 82.47661667 W, 8 June 2018, *McClelland 131* (NCU!); Seminole County: my home on Hermits Trail; Altamante Springs, 25 October 1963, *Schallert 521* (FTU!); St. Johns County: T6S, R29E, S39; 13 miles N. of St. Augustine and 15 miles S. of Jacksonville Beach off SR A1A in Guana River State Park. Approximately .25 mile W. of park gate at Guana River Dam. North side of road., 23 September 1990, *Herring & Herring 138* (FLAS!); south of Moses Creek and west of Matanzas River; Moses Creek Conservation Area; .28 miles north of SR 206 and 2.2 miles east of US 1, 16 September 2003, *Slaughter 14440* (FTG!); Sumter County: 6 mi. w. of Leesburg, 1 November 1967, *Baltzell 177* (FLAS!); Walton County: Eden Gardens State Park, 30.370883 N, 86.12180278 W, 3 August 2018, *McClelland 164* (NCU!); Georgia, Camden County: Cumberland Island National Seashore, 30.909086 N, 81.41468611 W, 1 October 2018, *McClelland & Neilan 188* (NCU!); Little Cumberland Island: 1.15 miles from the lighthouse on the north end of the island on a 166 degree azimuth., 1 October 1971, *Richardson 45* (MU!); Mississippi, Harrison County: Biloxi, Miss., 19 September 1899, *Tracy 4905* (CM!, NCU!); Jackson County: P. O. Ocean Springs, 21 August 1952, *Demaree 32960* (NCU!); P. O. Ocean Springs, 17 October 1954, *Demaree 36229* (NCU!, WILLI!); Gulf Islands National Seashore - Ocean Springs, 30.391514 N, 88.79065278 W, 6 August 2018, *McClelland 169* (NCU!); about 2 miles east of Ocean Springs, coast road., 7 October 1950, *Whitehouse 23907* (NCSC!).

Trichostema latens K. S. McClell., *sp. nov.* (Figure 12)



FIGURE 12. Holotype specimen of *Trichostema latens*. Photo by R. Kevan Schoonover McClelland.

Diagnosis:—Herbaceous to woody annual to 50 cm tall, morphologically most similar to *Trichostema dichotomum*. It differs from *T. dichotomum* by its oblong to oblanceolate leaves (vs. lanceolate to elliptic), obtuse to emarginate leaf apices (vs. acute to obtuse), shorter fruiting calyces of 5.44–5.89 mm (vs. 5.91–7.24 mm), style branch ratio of 1:2–1:4 (vs. 1:1–1:2), and shorter mature nutlets of 1.61–1.77 mm (vs. 1.75–2.16 mm) with small alveoli (vs. mid-sized to large alveoli; Figure 2).

Type:—U.S.A. Florida. Franklin County. F.S.U. [Florida State University] Coastal Marine Lab. W side of tidal creek on N side HWY 98. 15 November 2012, *Loran Anderson 26815* (holotype NCU!; isotypes FLAS!, GH!, NY!, US!, USF!).

Herbaceous to woody annual to 50 cm tall; branching primarily in the middle to upper part of the plant; stem hairs downwardly curved, rarely spreading to two, occasionally to three, cells long, with sessile glands; node hairs downwardly curved, rarely spreading, to two, occasionally to three, cells long; leaves widest towards the tip or near the middle, rarely widest towards the base, $(1.8\text{--}1.97\text{--}3.33\text{--}3.6) \times (0.42\text{--}0.53\text{--}0.99\text{--}1.1)$, average of 2.65×0.76 , cm, $(3\text{--}3.18\text{--}3.95\text{--}4.52)$, average of 3.56, times long as wide, base cuneate to attenuate, margin entire, apex rounded to emarginate; inflorescence hairs spreading, rarely upwardly or downwardly curved, to two, occasionally to three, cells long, with sessile and spreading glands to two, rarely to three, cells long (including gland); bracts widest towards the tip, occasionally widest near the middle, $(4.1\text{--}4.36\text{--}8.02\text{--}9.8) \times 1\text{--}2.23\text{--}3$, average of 6.19×1.61 , mm, $(3.27\text{--}3.49\text{--}4.45\text{--}5)$, average of 3.97, times long as wide, base cuneate to attenuate, margin entire, apex obtuse, occasionally $\pm 90^\circ$ or rounded, rarely acute or emarginate; fruiting calyx $(5.3\text{--}5.44\text{--}5.89\text{--}5.9)$, average of 5.67, mm long; buds dark blue-purple, corolla dark blue or blue-purple to blue or blue-purple; anthers dark blue or blue-purple to blue or blue-purple; style bifid, the longer arm 2–4 times as long as the shorter; mature nutlets alveolate, $(1.6\text{--}1.61\text{--}1.77\text{--}1.8)$, average of 1.69, mm long, hilum $(0.4\text{--}0.45\text{--}0.57\text{--}0.6)$, average of 0.51, mm long, $(0.25\text{--}0.27\text{--}0.34\text{--}0.35)$, average of 0.3, times the length of the nutlet alveoli small, ridges short to mid-sized (Figure 2g).

Phenology:—Flowers and fruits September to November.

Etymology:—The epithet *latens* (Latin, hidden or secret) is given to this species for two reasons. The first is for eluding the author's notice even after several years of intense study in this genus. Two sets of specimens, one from FLAS and one from NCU (and the only ones known to the author before he collected more in October 2021), were originally identified as *T. floridanum*, largely based on overall morphology and locality. Upon further morphological inspection, the author noticed differences in the FLAS specimen and assumed, erroneously, that it was an aberrant form of *T. floridanum*. This notion was abandoned later when the author reexamined the NCU collections (the designated types), which were from a different location and year than the FLAS specimen. A subsequent collecting trip allowed the author to revisit the collection sites, where he found both previously documented populations, one of which was growing in sympatry with *T. fruticosum*. There were no intermediate plants seen in the sympatric population. This collecting trip allowed these populations to be included in the genetic analyses that showed these plants were indeed distinct.

The second reason for the epithet *latens* is that, despite extensive field work by the author, no other populations of this species were found, meaning that the only populations known are the two collection sites. There are potentially more populations hidden elsewhere in this area of Florida that are waiting to be “found,” for it is doubtful that the entirety of this species occurs in only two places on a six-mile stretch of highway.

The common name of Hidden Bluecurls is given to this species for the same reasons.

Habitat and distribution:—*Trichostema latens* occurs in coastal and near-coastal scrubby flatwoods; 0–5 meters; USA: Florida: Franklin County. (Figure 13)

Conservation status:—Only two populations of this species are known despite much searching. It seems to have a similar ecological preference to *Liatis provincialis* Godfrey, so it may have a similar range. Future floristic surveys in the area may turn up more populations. This species has an extremely limited range and the threat to one of the currently known populations' existence is extremely high since it is on a roadside. Based on the data collected for this study, this species should be recognized at a G1 ranking (NatureServe 2020).

Additional specimens examined (paratypes):—U.S.A. Florida, Franklin County: NE of Carrabelle, on U.S. 98, 4.5 miles west of the bridge over Ochlochoknee Bay. On the South side of the road., 23 September 2001, *Edwards & Ionta 103* (FLAS!); Southern side of US 98, 1 road mile east of St. Teresa, 29.929721 N, 84.436264 W, 17 October 2021, *McClelland & Schoonover 224* (NCU!); Clearing north of FSU Marine lab on US 98, 29.918286 N, 84.512064 W, 17 October 2021, *McClelland & Schoonover 225* (NCU!).



FIGURE 13. Approximate range of *Trichostema latens* based on field data and herbarium records. This species is only known to occur in Franklin County, Florida.

Trichostema bridgesii-orzellii K.S. McClell., *sp. nov.* (Figure 14)

Diagnosis:—Suffrutescent perennial to 1 m tall, morphologically most similar to *Trichostema suffrutescens*. It differs from *T. suffrutescens* by its larger size to 1 m tall (*vs.* to 60 cm tall), longer fruiting calyces of 5.20–6.14 mm (*vs.* 4.76–5.97 mm), and a geographic restriction to the southern Lake Wales Ridge (*vs.* a geographic restriction to the Trail, Mt. Dora, Orlando, and northern Lake Wales Ridges).

Type:—U.S.A. Florida. Highlands County. Openings in scrub and sandy roadside. *Robert Kevan Schoonover, II, Edwin Bridges, and Steve Orzell 120a–h* (holotype NCU!; isotypes FLAS!, GH!, MO!, NCU!, NY!, US!, USF!). Note: Specimens *Robert Kevan Schoonover, II 120a–h* represent a single gathering in accordance with Article 8.2 of the ICN (Turland *et al.* 2018).

Suffrutescent perennial to 1 m tall; branching primarily in the lower to middle part of the plant; stem hairs downwardly curved to two, occasionally to three, cells long (Figure 1g), with sessile glands; node hairs downwardly curved, rarely spreading, to two, occasionally to three, cells long (Figure 1g); leaves widest towards the tip or near the middle, rarely widest towards the base, (0.8–)1.16–1.82(–2.3) × (0.28–)0.44–0.75(–1.04), average of 1.49 × 0.6, cm, (1.53–)2.09–3.06(–4.67), average of 2.57, times long as wide, base cuneate to attenuate, margin entire, apex rounded to emarginate, rarely obtuse; inflorescence hairs spreading, occasionally downwardly curved, to two, occasionally to three, cells long, with sessile and spreading glands to two, rarely to three, cells long (including gland); bracts widest towards the tip, (2.5–)3.41–5.32(–6.8) × (0.7–)1.13–2(–3), average of 4.36 × 1.57, mm, (1.79–)2.3–3.46(–4.63), average of 2.88, times long as wide, base cuneate to attenuate, margin entire, apex obtuse to rounded, occasionally acute to ±90°, rarely emarginate; fruiting calyx (4.1–)5.2–6.14(–7.3), average of 5.67, mm long; buds purple-black to dark blue-purple, corolla dark blue or blue-purple to blue or blue-purple; anthers dark blue or blue-purple to blue or blue-purple; style bifid, the longer arm 2.5–4.5, rarely as little as 2 or as much as 6, times as long as the shorter; mature nutlets alveolate, (1.4–)1.55–1.78(–1.9), average of 1.67, mm long, hilum (0.4–)0.55–0.73(–0.9), average of 0.64, mm long, (0.27–)0.34–0.43(–0.5), average of 0.38, times the length of the nutlet, alveoli small, ridges mid-sized, occasionally short, rarely tall (Figure 2h).

Phenology:—Flowers and fruits June to December. Some plants will have a small number of flowers February to May.

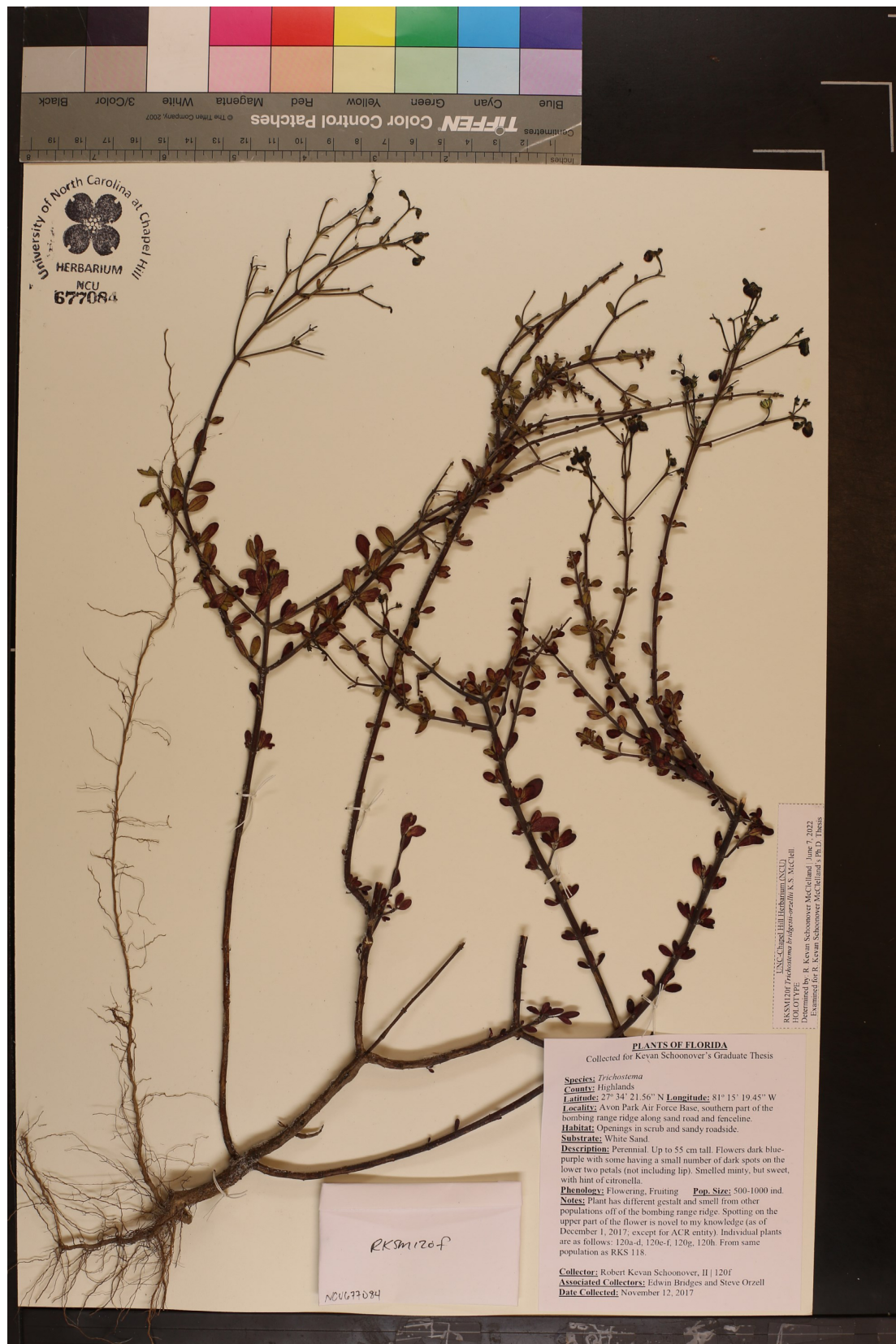


FIGURE 14. Holotype specimen of *Trichostema bridgesii-orzellii*. Photo by R. Kevan Schoonover McClelland.

Etymology:—This species is named after Edwin L. Bridges and Steve L. Orzell, who not only provided much assistance in collecting data for this study and co-collected the type specimens, but who also have had a long and impactful career studying the ecology and floristics of Florida, particularly of fire-maintained habitats. Several of their studies have focused on the Bombing Range Ridge and southern Lake Wales Ridge where this species is endemic.

Their work has not only improved our understanding of the seasonality of fire and of fire ecology overall, but also has uncovered several new plant taxa that are Florida endemics. As such, it is fitting to name this species in their honor. The common name Bridge's and Orzell's Bluecurls is given to this species for the same reasons. The names of the two men "usually stand independently," so a hyphenated epithet with each name in the genitive is used (Turland *et al.* 2018).

Habitat and distribution:—*Trichostema bridgesii-orzellii* occurs in scrub and sandhills; 5–100 meters; USA: Florida: Lake, Highlands, Orange, Osceola, and Polk Counties. (Figure 15)

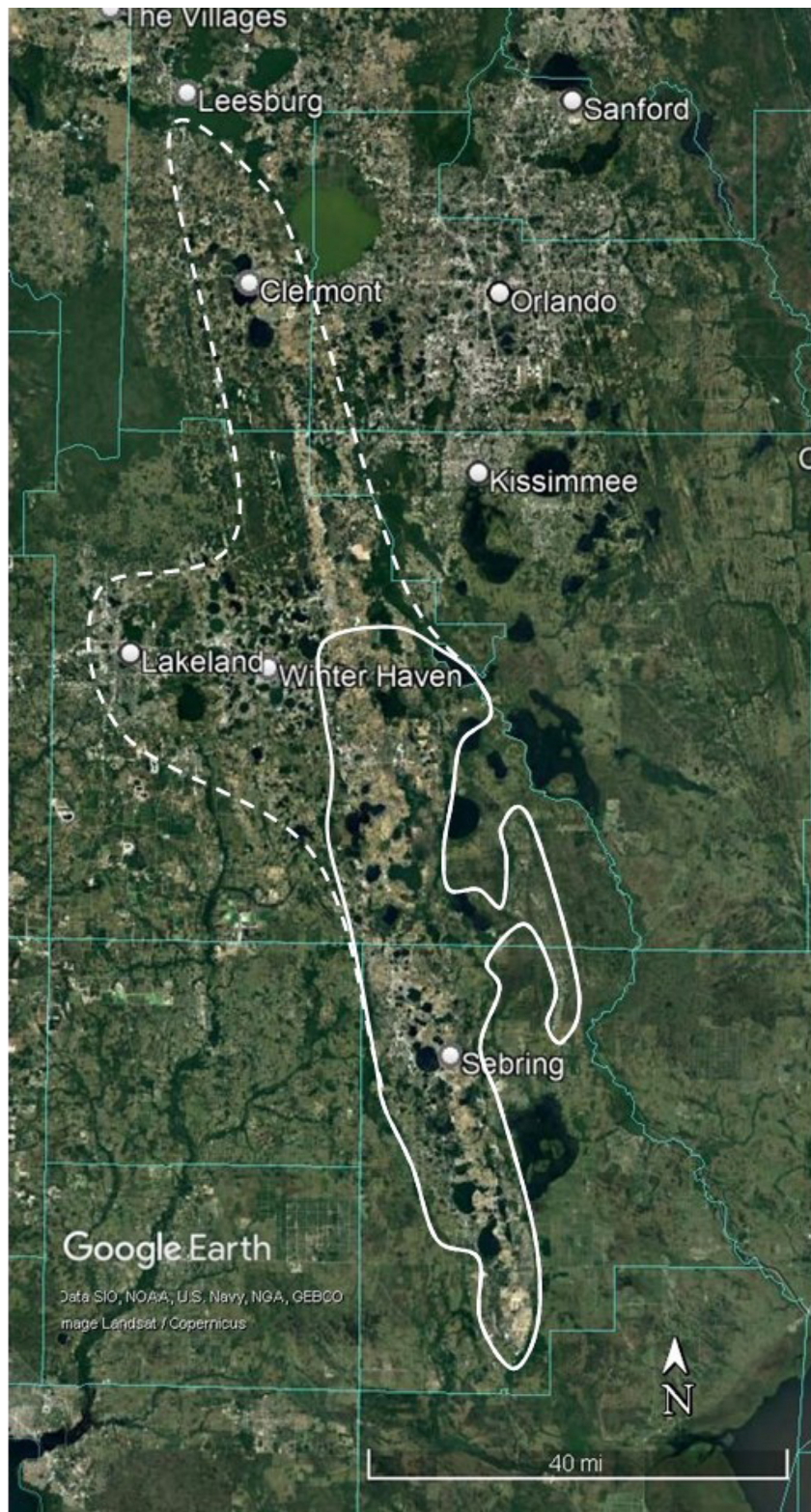


FIGURE 15. Approximate known range of *Trichostema bridgesii-orzellii* based on field data and herbarium records (solid line). The northern and western extent of this species is unknown due to extensive habitat loss and limited sampling, but given biogeographic patterns in other organisms, it is likely restricted to the Lake Wales Ridge (hashed line).

Conservation status:—Based on the data collected for this study, this species should be recognized at a G2 ranking (NatureServe 2020).

Notes:—This species is cryptic when compared to *T. suffrutescens* based solely on herbarium material. In the field it can be distinguished by its more robust size and the difference in the scent of its oils. Analysis of the volatile oils of these two species may help better define this difference, as has been done in the similarly distributed mint genus *Dicerandra* (McCormick *et al.* 1993). *Trichostema bridgesii-orzellii* occurs primarily on the Lake Wales and Bombing Range Ridges in Florida. The geographic split between this species and *T. suffrutescens* is unclear due to extensive habitat loss and the limitation which that imposed on sampling. Increased sampling of genetic and morphologic data from populations along the Lake Wales Ridge may help clarify the differences between these two taxa.

Additional specimens examined (paratypes):—U.S.A. Florida, Highlands County: Lake June-In-Winter Scrub State Park: N. end of park along fire lane, 22 October 2003, *Bishop LJ0155* (USF!); Archbold Biological Station, 10 miles south of Lake Placid, 7 September 1945, *Brass 15598* (FLAS!, US!); Sandleblanket Lakes opposite Perry Road, off Avon Park Cutoff leaving I27. On the western boundary of the preserve and adjacent citrus plantation, 25 November 2002, *Brockington & Edwards 113* (FLAS!); Sec. 07, R29E, T34S (Lake Arbuckle SW quad), 27.536946 N, 81.456847 W, 18 February 1986, *Christman 101* (FTG!); Lake Jackson Northwest Scrub (High 69), 28 February 1987, *Christman & Beck 1324* (FLAS!); NE Lake June in Winter Scrub (High80), 7 May 1986, *Christman & Dorman 575* (FLAS!); Highlands Hammock State Park: Burn zone H-54 NE; along SE park boundary; E1/2, SE 1/4, NE 1/4, SE 1/4, S4, T35S, R28E, 27.461984 N, 81.516059 W, 8 June 1994, *Cole HH0052* (USF!); on north side of Lake Annie, off of rte. 70 just west of Old State Road 8., 3 September 1981, *Correll & Correll 52393* (FTG!, USF!); Lake Placid., 13 September 1963, *Craighead s.n.* (USF!); east of Sebring, 14 April 1948, *Garrett s.n.* (NCSC!); 2.75 mi N of Fla 70 on Placid View Rd., 3.5 mi SSE of Lake Placid., 8 October 1978, *Hansen & Hansen 4835* (USF!); Placid View Drive Scrub (High 62), 4 March 1986, *Huck & Christman 3638* (FLAS!); West Lake Istokpoga Scrub (High 58), 5 March 1986, *Huck & Christman 3660* (FLAS!); East of Grassy Lake Scrub (High 47), 27.259416 N, 81.308549 W, 5 March 1986, *Huck & Christman 3712* (FLAS!, USF!); Archbold Biological Station, Lake Wales Ridge, Venus., 27.177347 N, 81.35264 W, 1 November 2012, *Kupihea s.n.* (NCU!); on terrace overlooking Lake June, just north of Jct. Temple Terrace, on Hwy #27, 25 February 1961, *Lakela 23776* (USF!); Vicinity of Avon Lakes., 30 March 1970, *Lakela 32010* (USF!); Highlands Hammock State Park, 27.463808 N, 81.51718333 W, 14 October 2018, *McClelland 201* (NCU!); Archbold Biological Station, 27.135097 N, 81.35855833 W, 15 October 2018, *McClelland 202* (NCU!); Archbold Biological Station, 27.134633 N, 81.35923056 W, 15 October 2018, *McClelland 203a* (NCU!); Archbold Biological Station, 27.134633 N, 81.35923056 W, 15 October 2018, *McClelland 203b* (NCU!); Archbold Biological Station, 27.134633 N, 81.35923056 W, 15 October 2018, *McClelland 203c* (NCU!); Highlands Hammock State Park, 27.433950 N, 81.51862222 W, 7 August 2017, *McClelland & Schoonover 94* (NCU!); Sec. 34. E. Of Botanical Garden, Sebring, 6 August 1934, *McFarlin 8349* (FLAS!); Lake Jackson; Sebring, 6 September 1934, *McFarlin 9402* (GA!); ca. 1.2 air mi N of Co Rd 700A (Arbuckle Creek Rd) at a point ca. 1.5 mi E of int Co Rd 17A, ca. 3 air mi NE of Sebring, 27.538889 N, 81.407222 W, 9 November 1990, *Orzell & Bridges 15809* (FTG!, USF!); ca. 0.4 air mi E of Echo Springs Rd at a point ca. 0.5 air mi S from jct. of Long Cypress Cut on Avon Park Air Force Range. NEQ, SEQ, SEQ, Sec 30, T33S, R31E; Lake Arbuckle 7.5' Quad., 27.57555556 N, 81.25222222 W, 28 November 2012, *Orzell & Bridges 26611* (NCU!); ca. 0.5 mi N of Arbuckle Creek Road at a point 1.0 mi E of Powerline Road and 2.1 mi E of jct FL 17 (Old US 27) on N side of Sebring; SWQ, SWQ, Sec 10, T34S, R29E, Lake Arbuckle SW 7.5' Quad; Carter Creek Unit of Lake Wales Ridge Wildlife and Environmental Area., 27.53027778 N, 81.41333333 W, 28 November 2012, *Orzell & Bridges 26613* (NCU!); Crossing of Fla. Rte 17 and Atlantic Coast Line Railroad, south-east of Sebring, 26 June 1962, *Ray, Jr., & Lakela 11064* (USF!); About four miles north of Lake Placid., 7 October 1960, *Ray, Jr., Lakela & Patman 10396* (FLAS!, NCU!, USF!); Sebring, 6 mi. S of along Rt. 27, 28 August 1953, *Sargent 6491* (GA!, NCSC!); Avon Park Air Force Range, 27.549492 N, 81.257875 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 117a* (NCU!); Avon Park Air Force Range, 27.549492 N, 81.257875 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 117d* (NCU!); Avon Park Air Force Range, 27.572656 N, 81.25540278 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 118b* (NCU!); Avon Park Air Force Range, 27.572656 N, 81.25540278 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 118l* (NCU!); Avon Park Air Force Range, 27.572656 N, 81.25540278 W, 12 November 2017, *Schoonover, II, Bridges & Orzell 120e* (NCU!); Avon Park Air Force Range, 27.572656 N, 81.25540278 W, 12 November 2017, *Schoonover, II, Bridges & Orzell 120f* (NCU!); Avon Park Air Force Range, 27.549492 N, 81.257875 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 117b,c,e,f* (RKSM!); Avon Park Air Force Range, 27.572656 N, 81.25540278 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 118a,c-k* (RKSM!); Avon Park Air Force Range, 27.572656 N, 81.25540278 W, 12 November 2017, *Schoonover, II, Bridges & Orzell 120a-d,g,h* (RKSM!); Carter Creek Management Area, 27.529344 N, 81.412975 W, 7 August 2017, *Schoonover, II, Schoonover & Orzell 96*

(NCU!); 30 miles south of Sebring along route 27., 25 August 1951, *Webster 4207* (NCSC!, US!); [Highlands County, Florida], 8 September 1958, *Welch s.n.* (NCU!); Lake County: SW of jct Phil C. Peters Rd (Avalon Claypit Rd) and Spyglass Hill Rd, ca. 0.1 mi W of Orange Co line, ca. 5 air mi SE of Clermont, 28.491389 N, 81.659722 W, 28 October 1991, *Orzell & Bridges 18729* (FTG!); Osceola County: Disney World West Entrance Scrub (Osce08). Sec. 01, T25S, R27E (Intercession City Quad), 28.345352 N, 81.562369 W, 24 September 1987, *Christman & Stout 1873* (FLAS!); on W side of Armadillo Ave, at intersection of Goodman Rd, ca. 0.9 mi S of Oak Island Rd, just W of Davenport Creek Swamp, ca. 2.5 air mi SE of US 27/US 192 jct; P. O. Wall, 28.318889 N, 81.65 W, 28 October 1991, *Orzell & Bridges 18693* (FTG!, USF!); About 4 miles northwest of Loughman., 14 October 1960, *Ray, Jr., Lakela & Patman 10466* (DUKE!, NCU!, USF!); Polk County: 3.5 mi S of Frostproof, 1.6 mi N of jct US 98S/27S on US 27A next to Hickory Lake., 20 October 1978, *Arcuri & Crewz 825* (USF!); along Fla. 580, 5 miles east of Haines City, 20 November 1969, *Baltzell 1464* (FLAS!); North Lake Marion Scrub (Polk36). Sec 33, 29 & 28, T27S, R28E (Dundee Quad). NE Lake Marion., 28.091741 N, 81.516184 W, 27 February 1986, *Christman 103* (FLAS!); West Wahneta Scrub (Polk53). Sec 19, T29S, R26E (Eloise Quad), 27.945631 N, 81.751193 W, 27 March 1986, *Christman 250* (FLAS!); Boy Scout Camp (Polk68). Sec. 06, T29S, R29E., 27.990767 N, 81.455695 W, 15 February 1987, *Christman & Beck 1246* (FLAS!); Pittsburg Scrub (Polk59). Sec. 34, T32S, R28E (Frostproof Quad), 27.653679 N, 81.506322 W, 29 September 1986, *Christman & Dorman 858* (FLAS!); Wolfold Scrub (Polk60). Sec 8, T31S, R27E (Alturus Quad), 27.799252 N, 81.637507 W, 10 October 1986, *Christman & Dorman 1016* (FLAS!); Tiger Creek Preserve. Wakeford Road Sandpines, 6 November 1987, *Christman, Morrison, Buckner & Dorman 2002* (FLAS!); 5.5 mi. E. of Fla. 580S, 7 October 1963, *Conard s.n.* (FLAS!); 1/4 mi. S of Canal Road on Rocky Point Road; T29S, R28E, Sect. 5, 27.994642 N, 81.536715 W, 22 June 1988, *Delaney 1817* (USF!); ca. 4.5 mi. SSE of Frostproof. T32S, R28E, Sect. 14, SW 1/4, 27.697072 N, 81.490127 W, 5 August 1987, *Hansen, Wunderlin & Delaney 11362* (USF!); NW of Lake Wales (Polk04). Lake Wales Quad T29S R27E S34, across from Station WIPC and adjacent to Grassy Lake., 27.917381 N, 81.602354 W, 3 October 1986, *Huck 4321* (FLAS!); Flaming Arrow Scrub (Polk 21). Hesperides quad. Sec 5, T30S, R29E. Off Route 60, take Boy Scout Rd North., 27.90251 N, 81.440503 W, 15 October 1986, *Huck 4507* (USF!); NW of Snell Creek, take dirt road opposite Miss Mary Ann Road off 580N for .9-2.9 mi., 7 October 1986, *Huck & Bissett 4364* (FLAS!); Catfish Creek State Park, 27.983403 N, 81.49451111 W, 8 August 2017, *McClelland & Schoonover 97* (NCU!); Lake Wales Ridge State Forest, 27.669856 N, 81.4083 W, 7 August 2017, *McClelland, Schoonover & Orzell 95* (NCU!); ca. 2.6 mi north on Old School Bus Road from FL 64, in Arbuckle Unit of Lake Wales Ridge State Forest; NWQ, SEQ, NEQ, Sec. 21, T32S, R29E; Lake Arbuckle 7.5' Quad., 27.68527778 N, 81.41972222 W, 28 November 2012, *Orzell & Bridges 26612* (NCU!); on N side of US 27A, .8 mi. E of US 27., 21 March 1979, *Richardson & Crewz 736* (USF!); Avon Park Air Force Range, 27.710475 N, 81.38609444 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 119a* (NCU!); Avon Park Air Force Range, 27.710475 N, 81.38609444 W, 11 November 2017, *Schoonover, II, Bridges & Orzell 119b* (NCU!); Common but rather localized in western part of preserve; Saddleblanket Lake Preserve, south of Avon Park cutoff road, west of US 27, 26 December 2001, *Sorrie 10828* (NCU!); on S side of Bravo Rd., ca. 1.2 mi NE of Frostproof Rd.; Avon Park AFR; Lake Arbuckle NE 7.5' Quad, 22 November 1996, *van Hoek 801A* (FLAS!, USF!); n. side of Fla. 17, 1.7 mi. ne.e. of junct. With U.S. 27, 2.5 mi. s. of Frostproof, S17, T32S, R28E, 4 November 1966, *Ward 6041* (FLAS!, GA!); northeast of Lake Wales near the Bok Tower, 14 August 1950, *Wilbur & Webster 2630* (NCSC!, US!).

Trichostema gracile K. S. McClell. *sp. nov.* (Figures 16 and 17)

Diagnosis:—Suffrutescent perennial to 60 cm tall, morphologically most similar to *Trichostema suffrutescens*. It differs from *T. suffrutescens* by branching regularly in the middle to upper part of the plant (*vs.* primarily near the base), its narrower leaves of 0.26–0.56 cm (*vs.* 1.13–1.74 cm), larger leaf length/width ratio of 3.87–7.08 (*vs.* 2.39–3.05), an ecological preference for mesic to scrubby flatwoods (*vs.* and ecological preference for scrub and scrub-sandhill ecotones), and a geographic restriction to xeric habitats off the main central ridge systems of Florida (*vs.* a geographic restriction to the main central ridge systems).

Type:—U.S.A. Florida. Highlands County. Roadside clearing in scrubby flatwoods, Avon Park Air Force Range, 14 October 2018, *R. Kevan Schoonover McClelland, Edwin Bridges, and Steve Orzell 199a–f* (holotype NCU!; isotypes FLAS!, GH!, NY!, US!, USF!). Note: Specimens *R. Kevan Schoonover McClelland 199a–f* represent a single gathering in accordance with Article 8.2 of the ICN (Turland *et al.* 2018).

Suffrutescent perennial to 60 cm tall; branching primarily in the middle to upper part of the plant; stem hairs downwardly curved to two, occasionally to three, cells long (Figure 1h), with sessile glands; node hairs downwardly curved, occasionally spreading, to two, occasionally to three, cells long (Figure 1h); leaves widest towards the tip or

near the middle, rarely widest towards the base, (1.3–)1.69–2.44(–3) × (0.2–)0.26–0.56(–0.88), average of 2.06 × 0.41, cm, (2.5–)3.87–7.08(–9.6), average of 5.47, times long as wide, base cuneate to attenuate, margin entire, apex rounded, occasionally obtuse, rarely emarginate or ±90°; inflorescence hairs spreading, occasionally upwardly curved, rarely downwardly curved, to three cells long, with sessile and spreading glands to two cells long (including gland); bracts widest towards the tip, rarely widest near the middle, (2.5–)3.36–5.46(–6.7) × (0.7–)0.83–1.64(–2.3), average of 4.41 × 1.24, mm, (1.81–)2.86–4.63(–5.67), average of 3.74, times long as wide, base cuneate to attenuate, margin entire, apex acute to obtuse, occasionally rounded; fruiting calyx (4.4–)5.07–5.87(–6.3), average of 5.45, mm long; buds purple-black to dark blue-purple, corolla dark blue or blue-purple to blue or blue-purple; anthers dark blue or blue-purple to blue or blue-purple; style bifid, the longer arm 4–6, rarely as little as 3 or as much as 9, times as long as the shorter; mature nutlets alveolate, (1.4–)1.48–1.73(–1.9), average of 1.61, mm long, hilum (0.3–)0.42–0.61(–0.7), average of 0.52, mm long, (0.21–)0.27–0.37(–0.44), average of 0.32, times the length of the nutlet, alveoli small, rarely mid-sized, ridges tall, occasionally mid-sized (Figure 2i).

Phenology:—Flowers and fruits September to December. Some plants will have a small number of flowers March to April.



FIGURE 16. Holotype specimen of *Trichostema gracile* in situ. Photo by R. Kevan Schoonover McClelland.

Etymology:—The epithet *gracile* (Latin: thin, slender) is given to this species based on its overall habit. It often has only one or a few erect stems whose short slender leaves give the plants a wand-like appearance, especially when vegetative. The common name Flatwoods Bluecurls is chosen for this species based on its ecological distribution.

Habitat and distribution:—*Trichostema gracile* occurs in mesic to scrubby flatwoods; 5–40 meters; USA: Florida: Brevard, Broward, Charlotte, Highlands, Hillsborough, Indian River, Lee, Manatee, Martin, Orange, Osceola, Palm Beach, Polk, Saint Lucie, Sarasota, Seminole, and Volusia Counties. (Figure 18)

Conservation status:—This species is quite widespread throughout the central and southern parts of the Florida Peninsula; however, the number of populations and their sizes are affected by its habitat requirements. Based on the data collected for this study, this species should be recognized at a G3 ranking (NatureServe 2020).



FIGURE 17. Holotype specimen of *Trichostema gracile*. Photo by R. Kevan Schoonover McClelland.

Notes:—*Trichostema gracile* corresponds to Lewis' "*Trichostema suffrutescens* with exceptionally narrow leaves" (Lewis 1945).

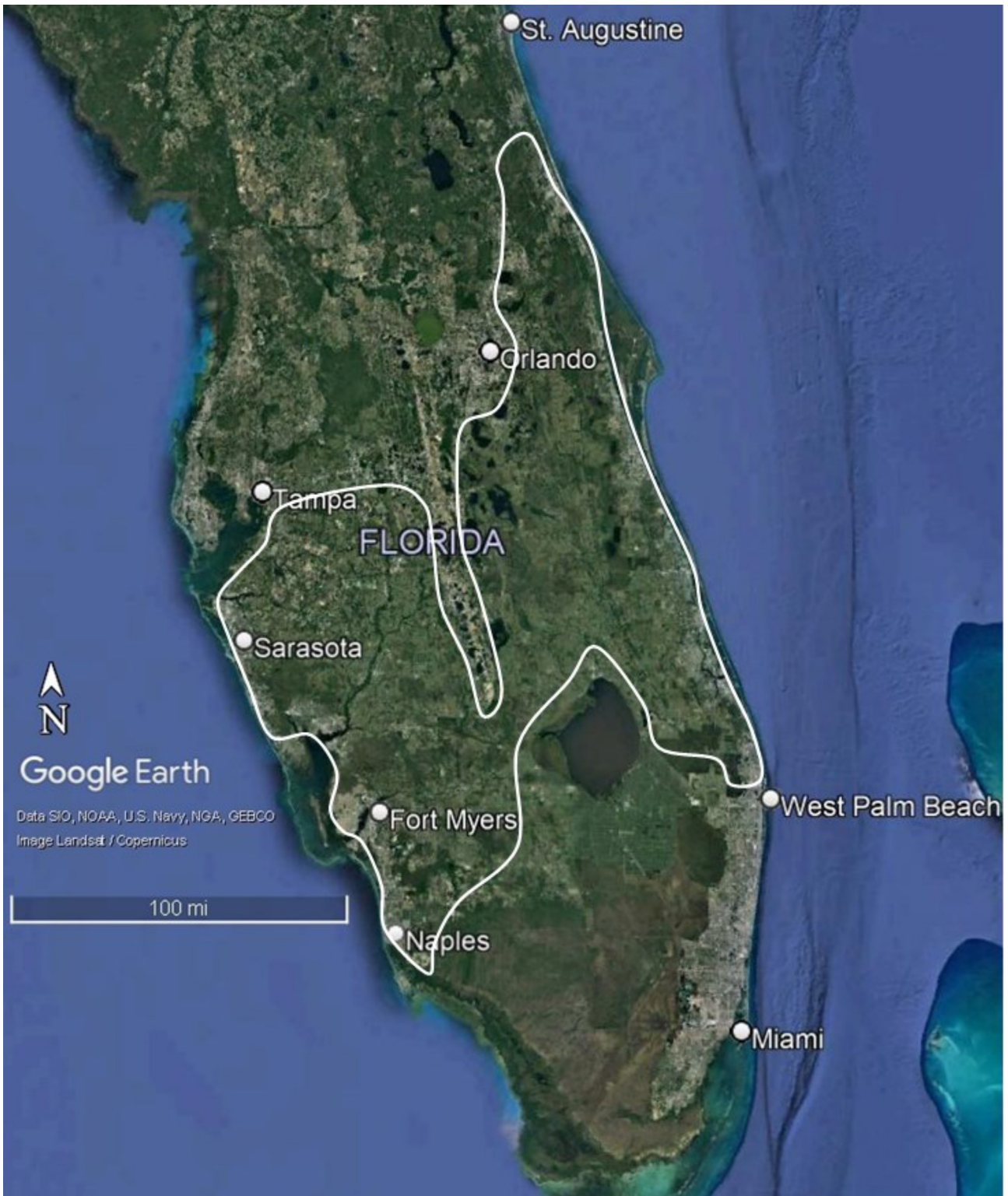


FIGURE 18. Approximate range of *Trichostema gracile* based on field data and herbarium records.

Additional specimens examined (paratypes):—U.S.A. Florida: S. Florida, s.d., *Anonymous s.n.* (USCH!); Brevard County: Near Cocoa Fla., April 1935, *Beardslee s.n.* (MU!); Indian River region, Brevard Co., 26 October 1902, *Fredholm 5508* (US!); N. verge of disturbed field behind horse barns, 28.162883 N, 80.667483 W, 15 November 2002, *MacClendon 119* (FTG!, USF!); Wickham Park, 28.158017 N, 80.659217 W, 12 October 2002, *MacClendon & Weichman 108* (USF!); Broward County: Tamarac, sand pine area south of Executive Airport, 8 October 1973, *Correll, Correll & Brackmann 40211* (FTG!); Charlotte County: Prairie/Shell Creek (SWFWMD) property; 0.5 km W of US 17, 0.6 km N of Taralane Drive., 26.991389 N, 81.964167 W, 11 September 2010, *Franck 2300* (USF!);

Prairie/Shell Creek (SWFWMD) property; 0.25 km W of US 17, 0.4 km N of Taralane Drive., 26.989722 N, 81.795 W, 30 October 2010, *Franck 2416* (USF!); Collier County: Collier Enterprises Scrub (Coll26). Sec 23, T50S, R25E (Naples South Quad), 26.101616 N, 81.774102 W, 19 February 1986, *Huck & Christman 3392* (FLAS!); Highlands County: Avon Park Air Force Range, 27.603922 N, 81.15660278 W, 14 October 2018, *McClelland, Bridges & Orzell 200* (NCU!); Avon Park Air Force Range, 27.601983 N, 81.157172 W, 12 November 2017, *Schoonover, II, Bridges & Orzell 121* (NCU!); Hillsborough County: End of Allen Rd. off C.R. 674, 2 October 1990, *Eilers s.n.* (USF!); Ca. 3.5 mi. SE of Riverview at Shadow Run development; ca. 0.5 mi. S of W end of lake., 26 October 1979, *Hansen, Richardson & Crewz 6766* (USF!); Balm-Boyette Tract, 3.0 mi. SSW of Boyette. T31S, R21E, Sec. 18, SE 1/4 of SW 1/4., 27.782776 N, 82.248499 W, 23 September 1994, *Landry & Vandaveer s.n.* (USF!); Balm-Boyette Tract, 2.9 mi. SSW of Boyette. T31S, R21E, Sec 18, SE 1/4 of SE 1/4., 27.782776 N, 82.248499 W, 8 September 1994, *Landry & Vandaveer s.n.* (USF!); Little Manatee River State Park, 27.673819 N, 82.37720833 W, 8 June 2018, *McClelland 133* (NCU!); Triple Creek Nature Preserve, 27.786342 N, 82.262044 W, 16 October 2021, *McClelland & Schoonover 214* (NCU!); Little Manatee River State Park: T32S, R19E, Sect. 23, SE 1/4, SW 1/4. Picnic area; between 2 pavilions to the East., 27.676477 N, 82.37945 W, 15 October 1998, *Myers 185* (USF!); About six miles southeast of Tampa, 28 October 1960, *Ray, Jr., Lakela & Patman 10564* (USF!); East of Balm-Boyette Road about 1.5 miles north of Balm, section 18, Township 31S, Range 21E., 27.782776 N, 82.248499 W, 23 October 1975, *Shuey 1502* (USF!); Indian River County: St. Sebastian River Preserve State Park, southwest quadrant along blue trail, 27.805497 N, 80.51129167 W, 9 August 2017, *McClelland & Schoonover 100* (NCU!); Lee Co., Florida, 18 October 1931, *Buswell s.n.* (FLAS!, FTG!); Estero Bay Preserve, Estero River Scrub Unit, south of Lazy Creek Blvd., 26.47229214 N, 81.8370023 W, 14 October 2021, *Horn s.n.* (NCU!); Manatee County: Wingate Creek State Preserve: SW 1/4, NW 1/4, NE 1/4, S7, T35S, R22E, 27.453731 N, 82.140431 W, 11 September 1997, *Becker & Hattaway WC0268* (USF!); South Fork State Preserve [Now part of Beker State Park]: in S portion of preserve; SE 1/4, SW 1/4, SW 1/4, NE 1/4, S20, T33S, R21E, 27.593339 N, 82.225057 W, 1 April 1995, *Cole & Owens SF0320* (USF!); Hwy 64, 15 mi. E of Bradenton, Manatee River Fish Control, park area., 25 October 1975, *Genelle & Fleming 2222* (USF!); Wingate Creek State Park, 27.454975 N, 82.14414444 W, 8 June 2018, *McClelland 132a* (NCU!); Wingate Creek State Park, 27.454975 N, 82.14414444 W, 8 June 2018, *McClelland 132b* (NCU!); Martin County: on N side of main road through Jonathan Dickinson SP, ca. 0.6 I W of railroad crossing, ca. 3.4 air mi SSE of Hobe Sound, 27.011667 N, 80.123611 W, 1 November 1995, *Bridges & Mears 23964* (FTG!); Jonathan Dickinson State Park, 27.015697 N, 80.12630556 W, 13 November 2017, *McClelland & Orzell 123* (NCU!); Haney Creek Park, Stuart, 27.225553 N, 80.257111 W, 15 October 2021, *McClelland & Schoonover 212* (NCU!); Jonathan Dickinson State Park. near the river camping area., 15 October 1978, *Popenoe 1446* (FTG!, NCU!); on St. Rd. 85, 5 miles S. of Stuart, 9 November 1945, *West & West s.n.* (FLAS!); Orange County: UCF Campus, next to Lake Claire, 28 October 1986, *Bard 861028-1* (FTU!); Christmas Florida, 26 October 1962, *Craighead s.n.* (FTG!); Osceola County: Bull Creek Mgt. Area. T27S, R34E, Sec 30., 28.077666 N, 80.915205 W, 13 October 1977, *Huck 1512* (NCU!); NC edge of Bull Creek Wildlife Management Area, S31, R34E, T27S., 28.074755 N, 80.911369 W, 15 October 1978, *Lotspeich 522* (FLAS!); Palm Beach County: Riverside Drive, Tequesta, 4 October 1969, *McCart 11065* (FLAS!, NCU!); Sarasota County: Deer Prairie Creek Preserve, Jordyn Parcel, northern parcel limit 4.5 miles east of intersection of S. Moon Dr. and Border Road, I-75 borders to the south., 27.102778 N, 82.266944 W, 23 October 2009, *Birch, Amos, Holst & Troxell 434* (USF!); Seminole County: Longwood, Fla., October 1930, *Beardslee 288* (MU!); Residence at 2409 Fawn Run, Oviedo. Found in the Oak hammock in the middle of the property., 15 November 2010, *Onisko 62* (FTU!); Volusia County: Tiger Bay State Forest, 29.187583 N, 81.16824167 W, 12 August 2017, *McClelland & Schoonover 103* (NCU!); Tiger Bay State Forest: Rima Ridge Tract, 29.173 N, 81.160936 W, 15 October 2021, *McClelland & Schoonover 211* (NCU!).

Trichostema hobe K. S. McClell. *sp. nov.* (Figures 19 and 20)

Diagnosis:—Virgate to bushy perennial to 60 cm tall, morphologically most similar to *Trichostema suffrutescens*. It differs from *T. suffrutescens* by its bushier (extensively and repeatedly branched) habit (*vs.* virgate), later flowering time of mid-October–mid-January (*vs.* August–early November), and a geographic restriction to the Jupiter Ridge (*vs.* a geographic restriction to the main central ridge systems).

Type:—U.S.A. Florida. Martin County. Openings in white sand scrub, Seabranch Preserve State Park, along road through center of park, 13 November 2017, *R. Kevan Schoonover, II, and Steve Orzell 122a–t* (holotype NCU!; isotypes B!, BM!, F!, FLAS!, K!, G!, GH!, MEXU!, MO!, NCU!, NY!, OS!, P!, PH!, RSA!, UC!, US!, USF!). Note: Specimens *R. Kevan Schoonover II 122a–t* represent a single gathering in accordance with Article 8.2 of the ICN (Turland *et al.* 2018).



FIGURE 19. Isotype specimen of *Trichostema hobe* in situ showing bushier habit than other species in the *T. suffrutescens* complex. Photo by R. Kevan Schoonover McClelland.

Suffrutescent to bushy perennial to 60 cm tall; branching throughout the plant; stem hairs downwardly curved to two, rarely to three, cells long (Figure 1i), with sessile glands; node hairs downwardly curved, to two, rarely to three, cells long (Figure 1i); leaves widest towards the tip or near the middle, occasionally widest towards the base, (0.99–)1.29–1.55(–1.7) × (0.33–)0.45–0.6(–0.69), average of 1.42 × 0.53, cm, (2.03–)2.46–2.98(–3.33), average of 2.72, times long as wide, base cuneate to attenuate, margin entire, apex rounded, rarely emarginate; inflorescence hairs spreading to downwardly curved, rarely upwardly curved, to two, rarely to three, cells long, with sessile and spreading glands to two cells long (including gland); bracts widest towards the tip, (2.5–)3.49–4.89(–5.5) × (0.7–)1.17–1.73(–2), average of 4.19 × 1.45, mm, (1.67–)2.34–3.61(–4.58), average of 2.97, times long as wide, base cuneate to attenuate, margin entire, apex rounded, rarely acute to ±90°; fruiting calyx (4.8–)4.85–5.45(–5.9), average of 5.15, mm long; buds purple-black to dark blue-purple, corolla dark blue or blue-purple to blue or blue-purple; anthers dark blue or blue-purple to blue or blue-purple; style bifid, the longer arm 2.5–3.5, rarely as little as 2, times as long as the shorter; mature nutlets alveolate, (1.5–)1.53–1.68(–1.8), average of 1.6, mm long, hilum (0.5–)0.56–0.71(–0.8), average of 0.63, mm long, (0.29–)0.34–0.45(–0.47), average of 0.4, times the length of the nutlet alveoli small, ridges mid-sized to short (Figure 2j).

Phenology:—Flowers and fruits October to January. Some plants will have a small number of flowers in the spring.

Etymology:—The epithet *hobe* [pronounced hoe-BAY] is given to this species for the anglicized place names Hobe [pronounced like robe] Mountain, Hobe Sound, and the village Jobé of the Jeaga, and later the Jobé Indians that inhabited the area of Martin County, Florida (Wheeler & Pepe 2002), where it is endemic. In fact, one can see nearly the entirety of the known range of this species from the summit of Hobe Mountain (personal observation). This epithet is a noun derived from the Latinization of the name for the indigenous peoples of the area and stands in apposition to the genus name, which is why it is not declined. The common name Jobé Bluecurls is given to this species for the same reasons.



FIGURE 20. Holotype specimen of *Trichostema hobe*. Photo by R. Kevan Schoonover McClelland.

Habitat and distribution:—*Trichostema hobe* occurs in scrub; 5–19 meters; USA: Florida: Martin County. (Figure 21).

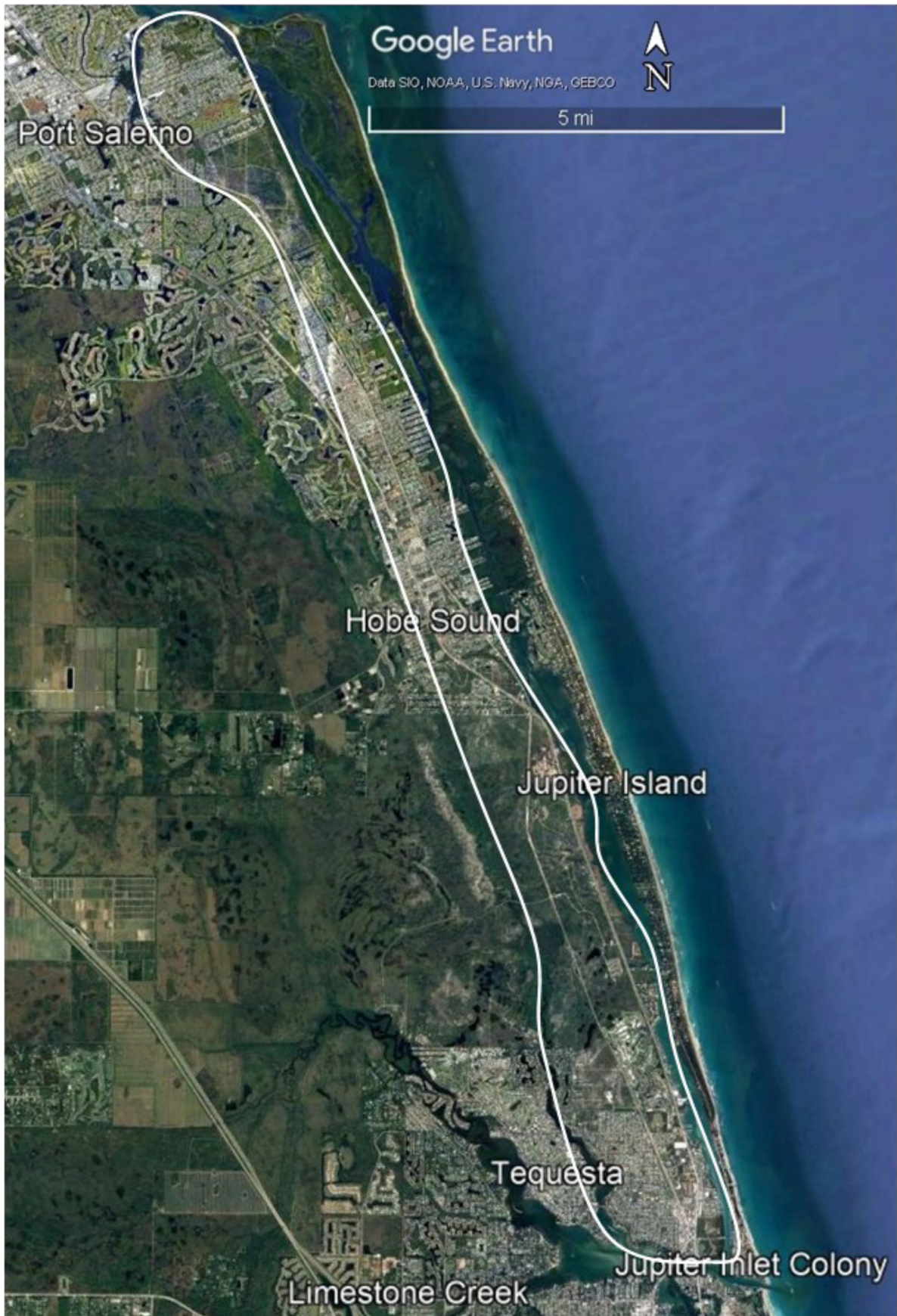


FIGURE 21. Approximate range of *Trichostema hobe* based on field data and herbarium records. This species is only known to occur in Martin County, Florida.

Conservation status:—This species has an extremely narrow range, only occurring in the strip of scrub along the part of the Indian River called Hobe Sound in Martin County, from Seabranche State Preserve in the north to Jonathan Dickinson State Park in the south. It potentially also occurs in Palm Beach County in the Jupiter area, specifically the Jupiter Inlet Lighthouse Outstanding Natural Area, and the scrub preserves along the Jupiter Ridge to the south, but this has not been verified. The known populations are quite large for this genus, numbering in the many hundreds in some cases. Based on the data collected for this study, this species should be recognized at a G2 ranking (NatureServe 2020).

Additional specimens examined (paratypes):—U.S.A. Florida, Martin County: Jonathan Dickinson State Park, 24 October 1950, *Beck 1157* (FLAS!); Seabranche. ... off Gomez Trail. Ca. 0.3 miles east of SR A1A, ca. 0.3 miles north of theoretical SE Farmington Pl., 27.129467 N, 80.16455 W, 18 December 1997, *Bradley, Woodmansee, Miller & Duquesnel 838* (FTG!); Hobe Sound National Wildlife Refuge, 27.006181 N, 80.09771944 W, 12 November 2018, *McClelland 206* (NCU!); Jonathan Dickinson State Park, 27.018397 N, 80.112625 W, 4 August 2017, *McClelland & Schoonover 90* (NCU!); Hobe Sound National Wildlife Refuge, 27.005951 N, 80.098044 W, 15 October 2021, *McClelland & Schoonover 213* (NCU!); Seabranche Preserve State Park, 27.131189 N, 80.16703889 W, 4 August 2017, *McClelland & Schoonover 92* (NCU!); 2 mi W. of Hobe Sound, along hiway U.S. #1., 30 November 1974, *Plettman & Turner F-48* (FTG!); Jonathan Dickinson State Park, Martin Co. Fla. Growing in pine woods near Casaurina camp ground, 10 November 1974, *Popenoe 290* (FTG!); Jonathan Dickinson State Park, 9 March 1981, *Smyth 5738* (WILLI!); Located in Jonathan Dickinson State Park (N. of Girl Scout Camp), March 1988, *Woodbury & Roberts s.n.* (USF!).

Trichostema microphyllum K. S. McClell. *sp. nov.* (Figures 22 and 23)

Diagnosis:—Virgate perennial to 60 cm tall, morphologically most similar to *Trichostema suffrutescens*. It differs from *T. suffrutescens* by its narrower leaves of 0.28–0.42 cm (*vs.* 1.13–1.74 cm), presence of spreading trichomes on the stem and at nodes (*vs.* downwardly curved), and a geographic restriction to the Brooksville Ridge and sandhill and scrub habitats to the west (*vs.* a geographic restriction to the Trail, Mt. Dora, Orlando, and northern Lake Wales Ridges).



FIGURE 22. Holotype specimen of *Trichostema microphyllum* *in situ*. Photo by R. Kevan Schoonover McClelland.



FIGURE 23. Holotype specimen of *Trichostema microphyllum*. Photo by R. Kevan Schoonover McClelland.

Type:—U.S.A. Florida. Citrus County. Sandy, xeric open forest, Withlacoochee State Forest, Citrus Tract along first trail crossing over Trail 11B south of its intersection with Trail 20, 7 October 2018, *R. Kevan Schoonover McClelland 190a–d* (holotype NCU!; isotypes FLAS!, NY!, USF!). Note: Specimens *R. Kevan Schoonover McClelland 190a–d* represent a single gathering in accordance with Article 8.2 of the ICN (Turland *et al.* 2018).

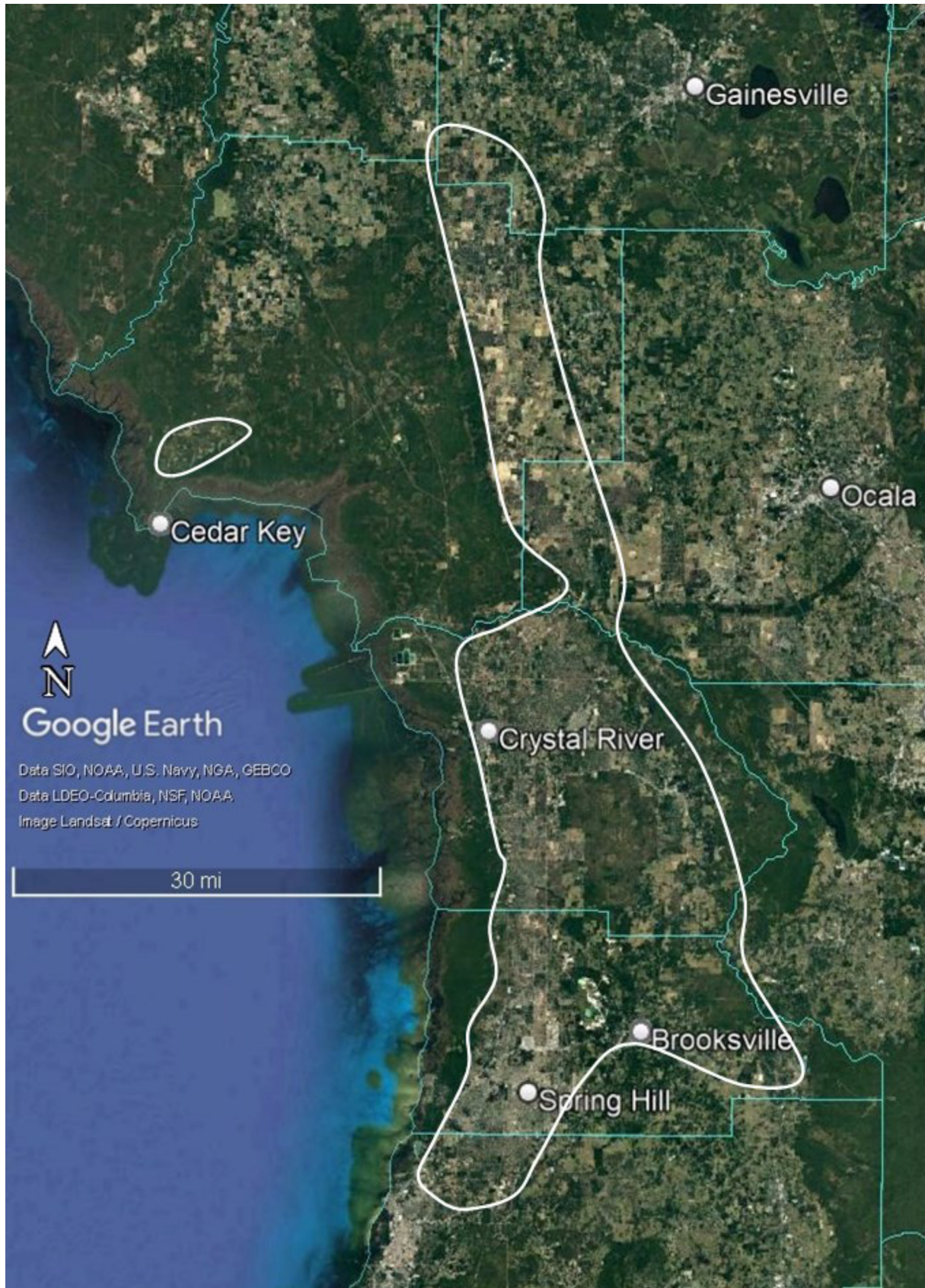


FIGURE 24. Approximate range of *Trichostema microphyllum* based on field data and herbarium records.

Suffrutescent perennial to 60 cm tall; branching primarily in the lower to middle part of the plant; stem hairs spreading, occasionally upwardly curved, rarely downwardly curved to three cells long (Figure 1j), with sessile glands; node hairs spreading to upwardly curved, to three cells long (Figure 1j); leaves widest towards the tip, 1.1–1.49(–1.9) × (0.24–)0.28–0.42(–0.54), average of 1.28 × 0.35, cm, (3–)3.2–4.31(–5.42), average of 3.76, times long as wide, base cuneate to attenuate, margin entire, apex rounded, rarely obtuse to acute or emarginate; inflorescence hairs spreading to upwardly curved, to three, rarely to four, cells long, with sessile and spreading glands to two cells long (including gland); bracts widest towards the tip, (2.8–)3.58–5.18(–6.4) × (0.5–)0.9–1.61(–1.9), average of 4.38 × 1.25, mm, (2.56–)2.7–4.77(–5.82), average of 3.73, times long as wide, base cuneate to attenuate, margin entire, apex rounded, rarely obtuse to acute or emarginate; fruiting calyx (5–)5.19–5.94(–6.3), average of 5.56, mm long; buds purple-black to dark blue-purple, corolla dark blue or blue-purple to blue or blue-purple; anthers dark blue or blue-purple to blue or blue-purple; style bifid, the longer arm 3.5–4.5 times as long as the shorter; mature nutlets alveolate, (1.4–)1.47–1.75(–1.8), average of 1.61, mm long, hilum (0.4–)0.47–0.62(–0.7), average of 0.55, mm long, (0.25–)0.29–0.39(–0.43), average of 0.34, times the length of the nutlet alveoli small, rarely mid-sized, ridges tall, rarely mid-sized (Figure 2k).

Phenology:—Flowers and fruits September to November.

Etymology:—The epithet *microphyllum* (*micro*: Latin, small; *phyll*: Latin, leaf) is given to this species since it has the smallest leaves by leaf area of any *Trichostema*. The common name Small-leaved Bluecurls is given to this species for the same reason.

Habitat and distribution:—*Trichostema microphyllum* occurs in sandhills and sandhill-scrub ecotones; 10–100 meters; USA: Florida: Alachua, Citrus, Hernando, Levy, Marion, and Pasco Counties. (Figure 24)

Conservation status:—This species is restricted to the Brooksville Ridge and xeric habitats to the west. While the full extent of its range is possible to predict, how common it is in this range has been difficult to determine. The Citrus and Croom tracts of Withlacoochee State Forest represent the largest and highest quality habitats for this species and most observations of this species have been from these two properties. Based on the data collected for this study, this species should be recognized at a G2 ranking (NatureServe 2020).

Additional specimens examined (paratypes):—U.S.A. Florida, Alachua County: just W of Archer, 15.8 mi W of Gainesville on hwy US-24., 25 October 1969, *Faircloth 6406* (NCU!); 4 mi. NW of Archer on SR 24., 7 December 1985, *Flietner 39* (WILLI!); west of Archer, 25 November 1921, *Small, Small & DeWinkeler 10046* (DUKE!, FLAS!, US!); Hernando County: Plants of the Weeki Wachee Area, SR 595, 27 September 1971, *Genelle & Fleming 1005* (USF!); Withlacoochee State Forest: Croom Tract, 28.586561 N, 82.255447 W, 16 October 2021, *McClelland & Schoonover 217* (NCU!); About 2 miles e. of Weekiwachee springs., 16 October 1959, *Ray, Jr. 9533* (USF!); 0.7 mi W of US 19 on FLA 595, T23S, R17E, Sect. 30., 28.455521 N, 82.641607 W, 16 October 1982, *Wunderlin & Beckner 9441* (USF!); Levy County: Archer Sandhills, State Road 24, 1 mile from Alachua County border by microwave tower., 29 October 1989, *Amoroso & Amoroso 153* (GA!); Levy County, 2 October 1948, *Ford 2344* (FLAS!); Goethe State Forest - Bailey Mine, 29.458953 N, 82.550275 W, 4 November 2018, *McClelland 204* (NCU!); Goethe State Forest: Bailey Mine Tract, 29.454238 N, 82.548642 W, 16 October 2021, *McClelland & Schoonover 221* (NCU!).

A new key to *Trichostema* section *Trichostema*:

1. Longest stem and node hairs three or more cells long; nodes with hairs primarily spreading, rarely also or only with hairs downwardly or upwardly curled; leaves widest towards the base or near the middle; longer style branch 1–2 times as long as the shorter (*Trichostema dichotomum* complex).....2
- Longest stem and node hairs three or fewer cells long; nodes with hairs primarily downwardly curved to appressed, rarely also with hairs spreading or upwardly curled; leaves widest near the middle or towards the tip, or linear; longer style branch 2 or more times as long as the shorter.....5
2. Plant annual, branching primarily from the middle to upper part of the plant; mid-stem hairs spreading, occasionally also downwardly or upwardly curled, longest spreading hairs five or more cells long (view at 40x); longest node hairs five or more cells long (view at 40x), spreading, rarely also upwardly curved; nutlet ridges distinct, steep sided, giving a clearly wrinkled appearance (view at 20x; see figure 2); widespread in eastern North America *Trichostema dichotomum*
- Plant perennial, branching throughout the plant; mid-stem hairs downwardly curved, occasionally also spreading, longest spreading hairs 3–6 cells long; longest node hairs 3–6 cells long (view at 40x), spreading, rarely also or only downwardly curved; nutlet ridges fainter, shallow sided, giving a smoother appearance (view at 20x; see Figure 2); restricted to the outer coastal plain of North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi.....3
3. Older plants leggy, medium sized bushes to 1.25 meters tall; largest leaves 2.75–5.5 cm long, 0.75–1.75 cm wide; primarily inland with coastal populations in Alabama, Mississippi, Georgia, the Florida Panhandle, and Northeast Florida; not restricted to obviously calcareous substrates..... *Trichostema fruticosum*
- Older plants compact, small to medium sized bushes to 1 meter tall; largest leaves 1–3.5 cm long, 0.5–1.25 cm wide; primarily on barrier islands of North and South Carolina or Peninsular Florida; restricted to obviously calcareous (i.e., shelly or limestone) substrates4

4. Largest leaves 1–2.3 cm long, 2–3 times as long as wide, often elliptic to rhombic; flowers lavender to white; anthers lemon yellow; along the coast of North and South Carolina..... *Trichostema nesophilum*
- Largest leaves 1.5–3.5 cm long, 2.25–3.75 times long as wide, often ovate; flowers varying shades of blue or blue-purple; anthers the same color as the upper petals; in peninsular Florida..... *Trichostema floridanum*
5. Plant annual; largest leaves 2–5 cm long, 5–25 times long as wide; widespread in the Southeast..... *Trichostema setaceum*
- Plant annual or perennial; largest leaves 1–3.5 cm long, 1.5–9 times long as wide; restricted to Florida.....6
6. Plant annual, branching primarily in the middle and upper part of the plant; largest leaves 1.8–3.5 cm long; restricted to the Florida Panhandle *Trichostema latens*
- Plant perennial, branching primarily near the base or throughout; largest leaves 1–2.5 cm long; restricted to the Florida Peninsula7
7. Largest leaves narrow, 3–9 times long as wide; nutlet ridges prominent, stocky, giving an intensely wrinkled or pockmarked appearance (view at 20x; see Figure 2).....8
- Largest leaves wide, 1.5–4.5 times long as wide; nutlet ridges faint to somewhat prominent, giving a smooth to slightly wrinkled appearance (view at 20x; see Figure 2).....9
8. Stem and node hairs primarily downwardly curved; largest leaves typically 1.5–2.5 cm long, 3.5–9 times long as wide; in mesic to scrubby flatwoods and scrub in the central to southern peninsula, not associated with the major ridge systems *Trichostema gracile*
- Stem and node hairs primarily spreading to upwardly curved; largest leaves typically 1.1–1.9 cm long, 3–5 times long as wide; in sandhill and sandhill-scrub ecotones on the Brooksville Ridge and areas west..... *Trichostema microphyllum*
9. Plant branching throughout; flowering October to January; restricted to Florida scrub near Stuart and Jupiter, Florida *Trichostema hobe*
- Plant branching primarily near the base; flowering June to December; restricted to the large central ridge systems and associated ridge spurs (e.g., Mt. Dora Ridge, Lake Wales Ridge).....10
10. Plant less robust, to 60 cm tall; leaves obovate, occasionally oblong to elliptic, very rarely ovate (5% of measured specimens); bract apices obtuse, occasionally $\pm 90^\circ$ to rounded or acute, very rarely emarginate (5% of measured specimens); mature calyces 4.7–6.0 mm; on the Trail, Mt. Dora, and Orlando ridges and associated ridge spurs *Trichostema suffrutescens*
- Plant more robust, to 1 meter tall; leaves obovate or oblong to elliptic, rarely ovate (20% of measured specimens); bract apices obtuse to rounded, occasionally $\pm 90^\circ$ to acute, rarely emarginate (11% of measured specimens); mature calyces 5.2–6.2 mm; on the Lake Wales and Bombing Range ridges and associated ridge spurs *Trichostema bridgesii-orzellii*

Additional specimens of currently named species in section *Trichostema* examined for morphological, phenological, and biogeographical analyses

Trichostema dichotomum:—U.S.A. Alabama, Butler County: E side Greenville, 2 October 1971, *Kral 44750* (NCSC!); Cherokee County: Little River below Al 273 bridge by jct. to Canyon Mouth Park, 22 September 1999, *Kral & Spaulding 88739* (USCH!, WILLI!); Conecuh County: SH, SWQ, Sec.17, T4N, R10E, on W side of co rd, 0.7 mile N of int Conecuh Co Rd 6 at London, at a point 3.5 mi E of int I-65 (Exit83 to Casteberry), ca. 3-4 mi W of Castelberry, Castelberry 7.5' Quad., 11 September 1989, *Orzell & Bridges 11763* (NCU!); DeKalb County: S. of Ft. Payne: Little River Canyon, ca. 0.75 mi. S. of Ala. 35., 14 October 1975, *Whetstone & Radford 7426* (NCU!); Etowah County: City of Gadsden; in the switch yards near the steel mills., 18 October 1975, *Whetstone 7353A* (NCU!); Franklin County: just east of Dismals Creek, just upstream from Gardens entrance, along roadside, 30 August 1966, *Clark & Landers 8058* (NCU!); Greene County: in Tombigbee River bottoms N of Epes by US 11., 5 October 1972, *Kral 48746* (CM!); Houston County: N side of Gordon by road East to Docks, 26 September 2006, *Kral 97670* (USCH!); Jefferson County: S. of Vestavia [Hills] above Cahaba River, 4 October 1968, *Kral 33610* (WILLI!); Lee County: Auburn, Alabama, September 1900, *Lloyd & Earle s.n.* (CM!); Mobile County: Mobile, Ala, 1878, *Mohr s.n.* (CM!); lakeshore of Big Creek Lake, 17 October 1967, *Wofford 10230* (NCU!); Montgomery County: by US 231, ca. 7 mi. n.w. Pine Level, 7 October 1974, *Kral 54501* (NCSC!); Arkansas, Ashley County: 0.5 miles west of main road 3.1 miles south of U.S. 82 in Felsenthal Wildlife Refuge west of Crossett, Sec. 30, T18S, R9W., 33.116606 N, 92.07207 W, 1 August 1986, *Thomas 97664* (MU!); recently constructed boat launch area south of U.S. 82 and east of Ouachita River west of Crossett, 2 August 1985, *Thomas & Hooks 93165* (CM!); Cleburne County: c. 4 mi. n. of Drasco, Ark. T13N-R9W-S19ne; on w. side of road., 1 October 1972, *Babb 1344* (NCU!); Conway County: Foothills of Petit Jean Mountain., 25 October 1965, *Demaree 360* (NCU!); Craighead County: near ravine; T15N, R4E, S29, 35.900895 N, 90.683793 W, 1 September 1975, *Richards 6373* (NCU!); Drew County: S-Monticello, 9 October 1960, *Moore 60135* (NCU!); Hempstead County: ca 1 mile east of Bois d'Arc Lake. Sect. 3, T. 14 S., R. 25 W., 33.560828 N, 93.681061 W, 3 September 1977, *Redfearn, Pyrad & Weber 31455* (NCU!); Hot Spring County: near Ouachita River., 22 September 1963, *Demaree 48945* (NCU!); Izard County: P.O. Optimus, 18 September 1950, *Demaree 29892* (NCU!); Montgomery County: Lake Ouachita, 12 September 1971, *Demaree 64224* (NCU!); Searcy County: on Nubbin Mountain, 6 September 1964, *Demaree 51596* (NCU!); Connecticut: Plants of Connecticut, s.d., *Wright s.n.* (CM!); Hartford County: Kensington, Conn., 25 August 1891, *Cowles s.n.* (MU!); East Hartford, Conn., 13 September 1897, *Weatherby*

243 (NCSC!); East Hartford, Conn., 13 August 1905, *Weatherby 1541* (NCSC!); Litchfield County: New Hartford; north of Nehantic Reservoir on rt. 202., 7 September 1989, *Mehrhoff 13003* (USCH!); Middlesex County: Middlefield, Conn., 28 August 1892, *Kofoid s.n.* (MU!); New London County: Greeneville, Conn., 3 September 1884, *Lumsden s.n.* (MU!); Greeneville, Conn., 26 August 1884, *Lumsden s.n.* (MU!); Tolland County: Conn 195 on w. side of Willimantic River, nw. of Storrs., 16 August 1983, *Nelson & Wnek 2858* (USCH!); Tolland County: Columbia, Conn., 5 September 1918, *Weatherby 4416* (NCSC!); Delaware, Sussex County: 3.3 miles east of Ellendale on Delaware 16., 2 September 1962, *Ahles & Baird 57775* (NCU!); West of Bridgeville, Marshy Hope Wildlife Area along Sand Hill Road (Road 569) at Jones Mill Branch, 38.773694 N, 75.704611 W, 23 September 2007, *Longbottom 10586* (NCU!); District of Columbia: Below Bennings, Maryland [sic; now Benning in the District of Columbia], 4 September 1891, *Anonymous s.n.* (NCU!); National Arboretum, 29 September 1994, *McNaull & Mazzeo 216* (MU!); Washington, D. C., 28 August 1897, *Steele s.n.* (MU!); Washington, D. C., 2 September 1896, *Steele s.n.* (MU!); Florida, Alachua County: Payne's Prairie Preserve State Park, 29.519858 N, 82.29408333 W, 29 June 2018, *McClelland & Schoonover 149* (NCU!); Rt. 234, 4.7 miles east of jct with 441. 5 1/2 miles southeast of Gainesville., 26 September 1998, *Penneys 1154* (FLAS!); Hogtown Creek, Gainesville, Fla., 30 September 1927, *Weber & West s.n.* (FLAS!); Baker County: between railroad and U.S. 90 on road to Ocean Pond, e. of Olustee, 22 September 1961, *Bielling s.n.* (FLAS!); south of St. Marys River at the end of St. Marys Cove Rd; 4.3 miles east of SR 121; Sec 1; T2S; R22E, 30.354597 N, 82.065967 W, 14 August 2007, *Slaughter & Minno 15830* (USF!); Along SR-121 S of junction with SR-23CE, N of McClenney, 30.330333 N, 82.123833 W, 17 October 1999, *Walker & Sutton 161* (USF!); Bay County: Pine Log State Park, 30.410686 N, 85.86869722 W, 2 August 2018, *McClelland 163* (NCU!); Calhoun County: Abe Springs; Myers Dairy Rd, 0.5 mi. S. of Abe Springs Rd, 30.38548 N, 85.1303 W, 12 October 2006, *MacClendon & MacClendon 529* (USF!); 15 miles north of Wewahitchka, floodplain of Chipola River, 18 May 1965, *McDaniel 6241* (FLAS!); Citrus County: off #48, east of Floral City., 26 August 1962, *Lakela s.n.* (USF!); Withlacoochee State Forest - Citrus, 28.709531 N, 82.42057222 W, 25 June 2018, *McClelland & Schoonover 142* (NCU!); Ft. Cooper State Park, 28.809056 N, 82.30702778 W, 26 June 2018, *McClelland & Schoonover 143* (NCU!); Crystal River. Old Rt. 19, north of Holiday Inn., 10 October 1982, *Schmid A-78* (USF!); Clay County: N.E. corner of Tampa Street and Bradenton Avenue, 28 August 1995, *Hall & Schultz 2059* (FLAS!); Along Fla 21 at Mill Creek, 0.3 mi. NE of jct. with Fla 215; ca. 2 mi. SW of Middleburg., 12 October 1979, *Hansen, Wunderlin, Saulea & Richardson 6576* (USF!); Jennings State Forest, 30.120997 N, 81.88183333 W, 9 October 2018, *McClelland 198* (NCU!); Moose Haven [Sic; Moosehaven], 30 September 1929, *O'Neill s.n.* (FLAS!, US!); Columbia County: T6S, R16E, S7 Six miles NW of Fort White off of CR 238 in Ichetucknee Springs State Park. Ca. 0.5 mile SE of North Entrance in S portion of section 4A., 29.985556 N, 82.758889 W, 24 September 1992, *Herring & Zomlefer 947* (FLAS!); O'Leno State Park, 29.914161 N, 82.58259444 W, 11 July 2018, *McClelland & Schoonover 152* (NCU!); Camp Oleno, 1 October 1939, *Watson & Murrill s.n.* (FLAS!); De Soto County: North of Arcadia, 4 June 1930, *Bright 4581* (CM!); North of Arcadia, 4 June 1930, *Bright 4594* (CM!); Dixie County: Along C-358, 0.2 mi. NW of its junction with US 19, ca. 2.5 mi. WNW of Cross City, 18 September 2008, *Hansen & Hansen 13338* (USF!); Duval County: Duval Co., N.E. Florida, October, *Curtiss 1976* (CM!, US!); Jacksonville: Fort Carolina National Monument and Timucuan Ecological and Historic Preserve: NPS right-of-way on Bacardi land on road to Thomas Creek parcel (no public access), just w of I-95; access through easement at deadend of Butch Bane Drive East., 1 October 2005, *Giannasi, Zomlefer, Burke & Smith 1681* (GA!); JULINGTON-DURBIN PRESERVE; W of Bartram Park Blvd, S of Old St Augustine Rd, 30.127226 N, 81.555066 W, 2 October 2009, *Slaughter 17531* (FTG!); Escambia County: 1/4 mi. w. of Canoe Creek, n. side hwy. #4., 4 September 1957, *Ford 5577* (FLAS!); Gulf Islands National Seashore - Ft. Pickens, 30.325883 N, 87.28851667 W, 5 August 2018, *McClelland 168* (NCU!); Big Lagoon State Park, 30.315239 N, 87.41834722 W, 6 August 2018, *McClelland 170* (NCU!); Flagler County: east of US 1, about 7 miles north of Bunnell, Florida & about 2 miles south of SR 204; Palm Coast Well Fields, 1 November 2000, *Slaughter 12223* (USF!); Palm Coast. Along SR100 between I-95 and Bunnell Airport., 29 August 1979, *Tabb s.n.* (USF!); Franklin County: Tate's Hell State Forest, 29.834247 N, 84.83971389 W, 14 July 2018, *McClelland & Schoonover 159* (NCU!); Gilchrist County: Along FL 26, 1.7 mi. W of Trenton., 25 October 1985, *Hansen, Wunderlin & van Hoek 10752* (USF!); e. of dirt road, 1.3 mi. n. of Lottieville, 5 mi. w. of Trenton, S10, T10S, R14E, 29.631055 N, 82.897901 W, 8 November 1963, *Ward & Ford 3589* (FLAS!, NCU!, USF!); Hart Springs, 1 October 1943, *West & Arnold s.n.* (FLAS!); Gulf County: 5 mi south of Wewahitchka on Rt. 71., 7 September 1970, *Meagher 369* (USF!); E side of Port St. Joe on US 98, ca. 5 mi. W of Gulf/Franklin Co. line, 29.762 N, 85.258833 W, 16 October 1999, *Walker & Sutton 153* (USF!); Hamilton County: Fla 135, 3 mi. n. of White Springs, 8 October 1966, *D'Arcy 1212* (FLAS!); 0.7-2.0 mi. N of C-6 on Cypress Creek Road., 19 September 2008, *Hansen & Hansen 13489* (USF!); Hernando County: Chinsegut Hill, 15 September 1959, *Cooley, Ray, Jr., & Eaton 6889* (NCU!); about 1 mile south from Nobleton on dirt road to Croom, 18 September 1981, *Correll & Correll 52514* (FTG!, USF!); about 1/2

mile south of junction of Rte. 41 and County Road 476., 18 September 1981, *Correll & Correll 52510* (NCU!); Vicinity of Brooksville, 22 October 1919, *Jones 105* (US!); Withlacoochee State Forest: Croom Tract, 28.586655 N, 82.258344 W, 16 October 2021, *McClelland & Schoonover 218* (NCU!); Withlacoochee State Forest - Croom, 28.590258 N, 82.22893056 W, 25 June 2018, *McClelland & Schoonover 141* (NCU!); Cypress Lakes Preserve, 28.522258 N, 82.19506389 W, 25 June 2018, *McClelland, Schoonover & Simpson 140* (NCU!); Chinsegut Hill Refuge, 3 September 1959, *Ray, Jr. 9402* (USF!); Along US 41, 10 miles s. of Brooksville., 22 October 1959, *Ray, Jr. 9565* (USF!); Hillsborough County: at the USF ecology area, 5 November 1979, *Bateson 106* (USF!); Along Morris Bridge Rd. ca. 4 mi. E of Tampa, 24 October 1977, *Funk 89* (USF!); north of Tampa. University of South Florida campus; West of Cypress, Buck Hammock, 18 June 1961, *Lakela 24289* (USF!); USF golf course. Tampa., 23 October 1966, *Lakela 30312* (USF!); in USF Ecological area., 29 September 1977, *Lindsey 15* (USF!); Hillsborough River State Park, 28.145642 N, 82.22689444 W, 24 June 2018, *McClelland & Schoonover 138* (NCU!); of USF Ecological area., 29 September 1977, *Robbins 6* (USF!); Along Morris Bridge Rd., N of Fowler Ave., 13 October 1977, *Rose 89* (USF!); 4 mi N of Tampa, N side of Fla 581, 31 October 1979, *Sauleda 3135* (USF!); along dirt road in USF Ecological Area., 29 September 1977, *Willett 1* (USF!); Holmes County: Along Fla 81, 1.3 mi. NW of Ponce de Leon (jct. US 90). T4N, R17W, Sec. 20, NE of SE., 30.741172 N, 85.958251 W, 28 September 1981, *Hansen 8857* (USF!); Jackson County: [Florida] Caverns State Park, Marianna, Jackson Co., Fla., 16 September 1949, *Hood 2790* (FLAS!); Three Rivers State Park, 30.738322 N, 84.93304167 W, 14 August 2018, *McClelland & McClelland 174* (NCU!); Jefferson County: Monticello, Fla., 19 September 1927, *Burger s.n.* (FLAS!); Lafayette County: Junction 27/20 & 354A, E of Alton, 30.053333 N, 83.098667 W, 16 October 1999, *Walker & Sutton 109* (USF!); Leon County: 2 miles north of Chaires at junction of highways #154 and 158., 27 September 1955, *Godfrey, Gillespie & Kral G9-55-38* (NCSC!); Lake Talquin State Park, 30.436136 N, 84.53115 W, 13 July 2018, *McClelland & Schoonover 155* (NCU!); Alfred Maclay Gardens State Park, 30.526328 N, 84.26264444 W, 13 July 2018, *McClelland & Schoonover 156* (NCU!); St. Mark's Preserve State Park, 30.370922 N, 84.087225 W, 15 July 2018, *McClelland & Schoonover 162* (NCU!); S. side of Fla 12, about 0.5 mi W. of Tall Timbers Research Station main gate., 26 September 1979, *Nelson 1381* (NCU!, USCH!); Bloxham Tract of the Lake Talquin State Forest, 15 September 1996, *Whitson 9609-6* (DUKE!); Levy County: Devil's Hammock Wildlife Management Area, 2 miles SW of Alternate U.S. 27 on C.R. 339A (Blue Springs Road) then up to ca 1 mile SW on Cabbage head Road., 29.450944 N, 82.697806 W, 16 October 2004, *Endara, Carlsward & Abbott 1352* (FLAS!); Manatee Springs State Park; along main road between entrance and Shackelfoot Trail., 6 October 1996, *Gulledge 127* (FLAS!); Goethe State Forest, 28.214575 N, 82.60270278 W, 27 June 2018, *McClelland & Schoonover 146* (NCU!); Goethe State Forest - Bailey Mine, 29.444617 N, 82.54428056 W, 28 June 2018, *McClelland & Schoonover 147* (NCU!); near Inglis, 12 July 1937, *Survey s.n.* (FLAS!); State Hwy 24, at entrance to Bronson Elementary School., 29.459717 N, 82.6273 W, 1 September 2001, *Tilley & Notis 2310* (FLAS!); Liberty County: Bordering park road, Torreya State Park, 30.568753 N, 84.946286 W, 19 October 2021, *Anderson-Messec & Anderson s.n.* (NCU!); 1/2 mile east of Hosford along hwy FL 20; sandy bank of Big Creek, 13 October 1980, *Carter 2609* (FLAS!, FTG!); Torreya State Park, opposite the entrance road to camping area, 26 October 1988, *Godfrey 82953* (FTG!, USF!); Torreya State Park, 30.568753 N, 84.94628611 W, 14 August 2018, *McClelland & McClelland 171* (NCU!); Madison County: Twin Rivers State Forest - Ellaville, 30.390725 N, 83.19961667 W, 12 July 2018, *McClelland & Schoonover 153* (NCU!); near west bank of Suwanee River, 0.5 mile southwest of Ellaville., 24 September 1954, *Perdue, Jr. 1828A* (NCU!, US!, USF!); 0.4 mi E of Pinetta along hwy Fla-150; Coastal Plain Province, 11 October 1976, *Yarbrough 17* (NCU!); Marion County: Indian Lake State Forest, 29.273111 N, 82.05577778 W, 7 October 2018, *McClelland 192* (NCU!); Ross Prairie State Forest, 29.034181 N, 82.29640833 W, 26 June 2018, *McClelland & Schoonover 144* (NCU!); Marjorie Harris Carr Cross-Florida Greenway, 29.047456 N, 82.25278333 W, 26 June 2018, *McClelland & Schoonover 145* (NCU!); W of Co Rd 484, ca. 1.8 air mi ESE of jct FL 200, ca. 7 air mi ESE of Dunnellon Municipal Airport; Cross Florida Barge Canal Lands, 29.0475 N, 82.253889 W, 23 September 1991, *Sheridan & Telford 877* (FTG!); 3.2 air mi NW of jct of I-75 and FL 484, 9.1 air mi W of jct of FL 484 and US 27/301/441 in Belleview; Cross Florida Barge Canal, 29.046667 N, 82.204167 W, 23 September 1991, *Sheridan & Telford 896* (FTG!); at Orange Springs, 16 September 1941, *West & Arnold s.n.* (FLAS!); Nassau County: Ralph Simmons State Forest, 30.791378 N, 81.96718889 W, 30 September 2018, *McClelland 184* (NCU!); Ralph Simmons State Forest, 30.791800 N, 81.96724167 W, 9 July 2018, *McClelland & Schoonover 151* (NCU!); Ralph Simmons State Forest, 30.791727 N, 81.967238 W, 15 October 2021, *McClelland & Schoonover 209* (NCU!); White Oak Plantation bordering on the St. Mary's River about 10 miles NW of Yulee. At the terminus of Brick Yard Road just at the end of Sandy Bluff Road near the St. Marys River, 23 October 1997, *Wilbur & Moore 69543* (DUKE!); White Oak Plantation Bordering on the St. Mary's River about 10 miles NW of Yulee. In the close vicinity of the Necroscopy Building just N of Gilman Drive and E of Spare Lake., 28 October 1997, *Wilbur & Moore 69987* (DUKE!); Okaloosa County: on Yellow River, Rt. 90, W. of Crestview, 1

October 1949, *Hood 3151* (FLAS!); Blackwater River State Forest, 30.838894 N, 86.74056944 W, 14 August 2018, *McClelland & McClelland 175* (NCU!); Blackwater River State Forest, 30.812567 N, 86.76703611 W, 14 August 2018, *McClelland & McClelland 176* (NCU!); Pasco County: Starkey Wilderness Park; 2.5 mi NNW of Odessa; T26S, R17E, Sec. 4, NW 1/4 of SE 1/4, 28.252254 N, 82.608474 W, 26 September 2003, *Ferguson & Kunzer 377* (USF!); Withlacoochee State Forest, Clay Sink Road, 9 August 1975, *Genelle & Fleming 2185* (USF!); Putnam County: Orange Pt., Welaka, 12 October 1940, *Laessle s.n.* (FLAS!); Carl Duval Moore State Forest, 29.635375 N, 81.86931944 W, 8 October 2018, *McClelland 193* (NCU!); Welaka State Forest, 29.469964 N, 81.65498333 W, 8 October 2018, *McClelland 194* (NCU!); Etoniah Creek State Forest, 29.732497 N, 81.84760556 W, 9 October 2018, *McClelland 197* (NCU!); Etoniah Creek State Forest. Roadside along Holloway Road, near entrance to Forest offices and crossing of Florida Trail., 29.76249 N, 81.84684 W, 3 November 2018, *Whitten 6240* (NCU!); Santa Rosa County: near Roeville, north of Milton, Santa Rosa Co., Fla., 6 October 1949, *Hood 3246* (FLAS!); St. Johns County: Faver-Dykes State Park, 29.668133 N, 81.26800833 W, 24 September 2018, *McClelland 182* (NCU!); Sumter County: Dade Battlefield Historic State Park: S20 T21S R22E, 28.652215 N, 82.126752 W, 1 October 2002, *Bishop & Alvarez DB0070* (USF!); Dade Battlefield Historic State Park: Along main trail; NW 1/4 NW 1/4 NE 1/4 S20 T21S R22E, 28.652215 N, 82.126752 W, 7 October 2008, *Gandy DB0145* (USF!); Florida National Cemetery, Bushnell, ca. 9.7 km (by air) SW of Bushnell, bordering Withlacoochee State Forest, 27 August 2006, *Strong 3671* (US!, USF!); 1.2 mi. N of Beville's Corner on FLA 471, T21S, R23E, Sect. 7, SW 1/4 of SW 1/4., 28.675594 N, 82.046384 W, 28 June 1984, *Wunderlin, Hansen & Robinson 9803* (USF!); Suwanee County: Luraville, 18 October 1987, *Anonymous 358* (MU!); north of Dry Run, flood plain of Suwannee River, Suwannee River State Park, 6 October 1976, *Martin & Cooper 915* (FLAS!); West of Highsprings, E. County Road 349. Lauraville, 9 October 1993, *Vajravelu 130* (FTU!); U.S.A. Florida, West of Highsprings, E. County Road 349. Lauraville, 9 October 1993, *Vajravelu 131* (FTU!); Taylor County: at Hampton Springs, 29 June 1936, *Correll 5733* (DUKE!); Ca. 6.2 miles E of Perry, along U.S. 27, 6.2 miles E of intersection with county road 30., 22 September 2001, *Edwards & Ionta 57* (FLAS!); W of Perry on U.S. 98, NW on Cabbage Grove Road (= Salt Road & Oakland Baptist Church Road) 3.55 miles, then 0.3 mile N and 0.8 mile E on public river access road., 11 October 2003, *Neubig, Abbott & Carlsward 92-2003* (FLAS!); Perry, 3 November 1946, *West & West, Erdman s.n.* (FLAS!); Union County: approx. 400 m N of Santa Fe river and 500 m W of state rd 121., 4 October 1986, *Ing 86239* (FLAS!); above Worthington Spring, w. of Fla. 23, n. of Santa Fe River, S32, T6S, R19E, 29.929208 N, 82.42655 W, 1 November 1962, *Ward & Ford 3068* (FLAS!); Volusia County: Blue Spring State Park. Along R. R. tracks [this forms east boundary of the park], 15 July 1986, *Profant 78* (FLAS!, WILLI!); Wakulla County: Wakulla State Forest, 30.243636 N, 84.28194722 W, 15 July 2018, *McClelland & Schoonover 160* (NCU!); Edward Ball Wakulla Springs State Park, 30.232081 N, 84.30475556 W, 15 July 2018, *McClelland & Schoonover 161* (NCU!); Walton County: 4 mi. S of Freeport; on our place, 28 September 1970, *Davis & Davis 15435* (CM!); S. of DeFuniak Springs, Walton Co., Fla., 25 September 1949, *Hood 2977* (FLAS!); Near the W edge of De Funiak Springs, along the RR, just N of the Country Club, 25 November 1980, *Wilhelm 8148* (USF!); Washington County: Rt. 277, near Vernon, Washington Co., Fla., 18 September 1949, *Hood 2823* (FLAS!); Georgia, Baker County: nr. Newton, August 1967, *Walters & Johnson s.n.* (CM!); Barrow County: at US 29 and Highway 324, adjacent to the Apalachee River, 26 September 1992, *Seward 1662* (USCH!); Bulloch County: Lake margin at Cypress Lake (Lott's Creek) 2.5 mi west of U.S. hwy 301 & 5.0 mi south of Ga. Southern College, 9 October 1964, *Hall 41* (NCU!); Camden County: Cumberland Island National Seashore, 30.925053 N, 81.41168333 W, 1 October 2018, *McClelland & Neilan 187* (NCU!); Cherokee County: at S side of Etowah R. 5.8 mi. E 20 degrees S of Allatoona Dam., 23 September 1948, *Duncan 8907* (NCSC!); Cook County: FLORA OF GEORGIA Cook County along the Withlacoochee River on the O.C. Marshall property, 8.5 mi SE of Adel. COASTAL PLAIN PROVINCE, 26 August 1965, *Faircloth 2915* (NCU!); DeKalb County: Stone Mountain, 16 mi. NE of Atlanta, 26 September 1943, *Windack s.n.* (CM!); Effingham County: PLANTS OF GEORGIA Effingham County Two miles from Clyo by roadside., 24 October 1959, *Boole, John A. 1027* (NCU!); Fannin County: GEORGIA Effingham County Railroad right-of-way along Toccoa River valley, 0.9mi. sw of Mineral Bluff., 30 August 1966, *Bozeman 8075* (NCU!); Gilmer County: GEORGIA Gilmer County; on Cherry Log Creek, 1.5 mi. west of Cherry Log community., 30 August 1966, *Bozeman 8100* (NCU!); Glynn County: Jekyll Island, 2 October 1982, *Angerman s.n.* (NCSC!, USCH!); on the W side of Jekyll Island. COASTAL PLAIN PROVINCE, 9 September 1971, *Faircloth 6998* (NCU!); sandy trail between outlet of easternmost inland salt marsh and Clam Creek, Clam Creek recreation area, N end of Jekyll Island., 22 September 2002, *Lee 203* (USCH!); Grady County: FLORA OF GEORGIA Grady County; on the S side of Turkey Creek, 6.5 mi SW of Cairo near Tired Creek Church. COASTAL PLAIN PROVINCE, 7 September 1965, *Faircloth 2991* (NCU!); Liberty County: Camp Stewart Reservation, near Hinesville, 16 September 1944, *Grimm s.n.* (CM!); Long County: GEORGIA Long County; 5 mi. w. (on Ga. 261) of U.S. 301 at Beard's Creek., 6 October 1962, *Bozeman & Radford 1716* (NCU!); Lowndes County: FLORA OF GEORGIA Lowndes

County. on country road connecting U.S.-84 and Ga.-31, 3 mi E of Valdosta. COASTAL PLAIN PROVINCE, 25 September 1963, *Faircloth 607* (NCU!); McIntosh County: GEORGIA McIntosh County e. of Ft. Barrington., 12 September 1963, *Bozeman 3077* (NCU!); west-central part of Sapelo Island, 16 September 1956, *Duncan 20513* (NCSC!, NCU!); Morgan County: GEORGIA Morgan County Off road to Lake Rutledge boat ramp; Hard Labor Creek State Park, 2 mi. N. of Rutledge., 27 August 1978, *Hill 681* (NCU!); Rabun County: Chattooga River Gorge: 1/2 to 1 mile above Russel Bridge along Chattooga River., 20 August 1968, *DuMond 1491* (NCSC!); Richmond County: Fort Gordon Military Reservation, Training Area 31; surrounding Grady Ponds, 28 August 1991, *Moore, Giannasi, Brooks & Laumeyer 1310* (USCH!); Seminole County: lake Seminole. Seminole Lake Road, 8 October 2001, *Francl, Kruse, Morgan, Totin & Waters 370* (GA!, USCH!, USF!); Thomas County: alongside Ga-133, 2.1 mi S of Boston at Merrily Plantation, 30 August 1965, *Faircloth 2958* (NCU!); Walker County: Pigeon Mountain Wildlife Management Area. S of GA hwy 193 and E of county rd 1763. "The Pocket.", 2 October 1981, *Jones, Coile, Smith, Hunt & Hill 23728* (CM!, NCSC!); Indiana, Lake County: about 0.4 miles east of Liverpool Junction, 15 September 1946, *Friesner 21049* (MU!); Kentucky, Calloway County: Ky. 94W, 0.4 mi. from Marshall Co., 31 August 1972, *Athey 2075* (CM!); Backusburg Hill... 3 miles W of Kirksey on Hiway 464. S side of rad; E side of River., 36.708333 N, 88.458333 W, 27 August 1972, *Fuller 1136* (NCU!); Knox County: Barbourville, 5 September 1888, *Lloyd s.n.* (CM!); Lincoln County: 0.75 miles north of Hall's Gap., 7 October 1937, *Wharton 1359* (NCU!); Marshall County: at Jewell Minter farm on Elve Road., 7 September 1971, *Athey 1514* (NCU!); McCreary County: Cumberland Falls State Park, below falls of Cumberland River and junction of US hwy 25 W., 16 September 1982, *Utech, Thomas, Thompson & Ohara 82-473* (CM!); Pike County: College Farm, John's Creek, 20 September 1982, *Levy s.n.* (NCU!); above Spillman Apts [Apartments], Pikeville College campus, 16 September 1982, *Levy s.n.* (NCU!); behind old Davis house, Flutey Holler on Rt. Fk. of Brushy Creek, 5 September 1982, *Levy & Barkman s.n.* (NCU!); Rockcastle County: Five milies south of Mt. Vernon, 30 September 1944, *McFarland 64* (NCSC!); Trigg County: Land Between the Lakes between markers 8G2 and 7F2, 13 September 1966, *Forrester 2541* (NCU!); Louisiana, Beauregard County: on road to river 1/2 mi. s. of Bayou Amacoco [sic; Anacoco], 7 October 1960, *Ewan 20120* (NCU!); Claiborne County: between Corny Bayou and Three Creeks off Cupps Crossing Road, ca. 7 miles west of Junction City, 4 September 1994, *Holmes 7436* (MU!); Grant County: beside La. 8, 3 miles north of Boyce, 31 August 1968, *Thomas, Smith & Reid 12592* (NCU!); Jackson County: beside La. 146, 4 mi. NW of Chatham, Sec 30, T16N, R1W., 31 August 1970, *Thomas & Reid 21144* (NCU!); Morehouse County: NW 1/4, Sec. 24, T23N, R5E, S. of Irvine Lake, 32.967246 N, 91.908998 W, 25 October 1969, *Thomas, Scarbrough & Reid 17115* (CM!, NCU!); Ouachita County: east of La. 557 and southwest of Luna, Sec. 10, T15N, R2E, 32.298437 N, 92.252257 W, 15 September 1982, *Taylor & Thomas 2090* (MU!); west of La. 557 just north of Caldwell Parish Line, south of Cypress and Luna, Sec 15, T15N, R2E., 32.284028 N, 92.252224 W, 31 August 1983, *Taylor & Thomas 5221* (MU!); east of La. 557 at Cypress Turnoff west of Luna; Sec. 2, T15N, R2E, 32.3205 N, 92.242238 W, 11 October 1988, *Thomas 108198* (MU!, NCU!); west of La. 557 between Cypress Creek and Caldwell Parish line south of Luna; Sec. 15, T15N, R2E., 32.284028 N, 92.252224 W, 6 October 1985, *Thomas 93823* (USCH!); southeast of Lapine Road north of creek and about 7 miles southwest of La. 34 and 3033 intersection southwest of West Monroe, Sec. 20, T16N, R2E., 32.357188 N, 92.286714 W, 4 October 1987, *Thomas 102563* (WILLI!); near Waterside Park Subdivision E. of Monroe, 5 October 1968, *Thomas & Thomas 12592* (NCU!); St. Helena County: ca 4 miles NE of Greensburg in Sec 21 T2S R6E, 30.861428 N, 90.609362 W, 6 October 1979, *Allen 9741* (NCU!); Union County: along Union Parish Road 2220 ca. 2.0 miles west of Ouachita River and 4.0 miles northeast of Haile, Sec. 24, T22N, R3E, 32.880493 N, 92.113059 W, 21 September 1983, *Taylor & Thomas 5870* (MU!); Washington County: along unmarked paved road off LA 436, ca 1.2 mi. W of jct. LA21, ca 1.5 mi. W of Vernado, 30 September 1979, *Allen & Vincent 9687* (NCU!); Washington County: From LA 436, travel northward on the road which leads to Hilltop Missionary Baptist Church. Continue past the church to the Monroe Creek Missionary Baptist Church. The collection side is 2.4 road miles north of LA 436; northeast of Pine, Louisiana. R13E, T1S, section 41., 27 October 1990, *Urbatsch, Langevin, Rossi, Lievens & members of the Flora of Louisiana class 6857* (NCU!); Maine, Cumberland County: Windham, Me., August 1883, *Kelsey s.n.* (MU!); Knox County: vicinity of Rockland, August 1922, *McClelland s.n.* (CM!); Lincoln County: on railroad track, n.e. side Sidensparker Pond, e. Waldoboro, Lincoln Co., Me., 1/4 mi. s. and w. of Warren township and Knox Co., 10 August 1950, *Rossbach 2064* (NCU!); Oxford County: between Kezar River & E. Fryeburg village, Freyburg., 19 August 1964, *Rossbach & Josselyn 6152* (NCU!); York County: Chases Pond, 19 August 1907, *Hubbard s.n.* (NCU!); N. Berwick, August 1900, *Parlin 1377* (NCU!); Maryland, Allegany County: on southeast slope facing Potomac River ... About 1 mile south of Picardy, 22 September 1969, *Downs 9358* (NCU!); Caroline County: North of Fedralsburg, along Smithville Road at Sullivan Branch, growing along old farm road north of the creek, 38.7325 N, 75.764028 W, 23 September 2007, *Longbottom 10,550* (NCU!); Montgomery County: Chevy Chase, MD, 5 September 1904, *Chase 2605* (MU!); Rockville, 14 September 1944, *McClelland s.n.*

(CM!); Prince George's County: 1 1/2 mi. S.E. of Suitland, 27 August 1947, *Jones 1337* (NCSC!); Washington County: Sideling Hill, 27 September 1973, *Brown & Gilpin s.n.* (NCU!); south-southwest slope ... facing Potomac River ... at Pearre, 22 September 1969, *Downs 9722* (NCU!); Massachusetts, Barnstable County: Hyannis, Cape Cod., 1934, *Allabach s.n.* (CM!); Wood's Hole, Mass., 29 August 1892, *Metcalf s.n.* (MU!); Berkshire County: Western Massachusetts; Lanesboro [sic; Lanesborough], 4 September 1915, *Knowlton s.n.* (NCU!); Bristol County: North Easton, Mass., 18 September 1898, *Hall 821* (NCSC!); Essex County: Andover, Mass., 16 September 1887, *Blake s.n.* (MU!); Andover, Mass., August 1883, *Steele s.n.* (MU!); Franklin County: Leyden, Mass., 1 September 1928, *Ewer s.n.* (NCU!); Hampden County: Palmer, 24 August 1974, *Ahles 79210* (CM!); Church Lane, Chicopee, Mass., 2 September 1902, *Day s.n.* (MU!); Westfield; Westfield State College south campus, 8 September 1997, *Egan s.n.* (CM!); Hampshire County: along railroad, just east of Amherst College, Amherst, 28 September 1966, *Ahles 64796A* (NCU!); around the powerhouse at a borrow pit at Quabbin Reservoir, north off state route 9., 10 August 1986, *Harriman 18407* (MU!); N. of Southampton, 5 September 1930, *Manning s.n.* (NCU!); Middlesex County: Cambridge, Mass., September 1890, *Underwood s.n.* (CM!); Norfolk County: Wellesley, 25 August 1919, *McCallum s.n.* (CM!); Mississippi, Clay County: bank of Tibbee Creek, 4.5 mi. s. of West Point, 30 August 1955, *Ray, Jr. 5854* (NCU!); Harrison County: Pass Christian, 24 August 1956, *Buker s.n.* (CM!); Lamar County: 4 mi. W of Hattiesburg, 13 September 1964, *Jones 2513* (NCU!); Madison County: around Waterfowl REFuge on Ross Barnett Res., hwy 43, SE of Canton, 10 September 1969, *Jones, Chapman, Faust, Parker & Urbatsch 18019* (NCU!); Perry County: along For. Ser. Rd. 368, Camp Shelby Training Area 9, SE of Bellville; T3N, R11W, Sect. 20., 19 September 1995, *Leonard 9092* (NCU!); Missouri, Iron County: Elephant Rocks State Park, 20 September 1975, *Dorr 118* (NCU!); Jefferson County: NBA LaBarque Hills, Pacific Quad., Wade Rd., off "NN", off "O", off "F"., 12 October 2003, *Vincent, Thomas & Thomas 11436* (MU!); Shannon County: on Current River just across from Two Rivers. Sect. 9, R. 3 W., T. 29 N. Station 39. Site 3, 37.190603 N, 91.277169 W, 29 September 1969, *Redfearn, Weber, Milliger & Witherspoon 1746* (NCU!); New Hampshire, Coos County: Randolph, 9 September 1958, *Pease 39420* (MU!); Hillsborough County: Wilton, N.H., August 1848, *Dascomb s.n.* (MU!); New Jersey, Atlantic County: Atlantic Cranberry Meadows, Weymouth, 14 August 1922, *Bassett s.n.* (CM!); Landisville, August 1887, *Gross 68* (CM!); Bergen County: Rt. 17, Paramus, 11 September 1956, *Roszbach 1007* (CM!); Cape May County: Cape May County, NJ, 6 September 1925, *Bright s.n.* (CM!); Cape May Point, Cape May, 30 September 1917, *Gershoy 587* (MU!); 2 mi. NW of Ocean View, 23 August 1948, *Henry s.n.* (CM!); Morris County: Side Highway 15, Woodport., 25 August 1957, *Hoiberg 711* (NCU!); New York, Dutchess County: East Hyde Park, 27 August 1949, *Ahles 1595* (MU!); Nassau County: Sagamore Hill National Historic Site, Oyster bay., 26 September 1996, *Stalter 35* (USCH!); New York County: along elevated railroad on west side of 10th Avenue, between 13th St and 35th St. West side of Manhattan, 19 September 2002, *Stalter 18* (USCH!); Suffolk County: Southampton Core region, 4 miles N of Southampton, 3 August 1953, *Henry s.n.* (CM!); Plum Island, 26 September 2002, *Stalter 278* (USCH!); Westchester County: Kensico, North Castle, 21 August 1918, *Gershoy s.n.* (MU!); North Carolina, Alamance County: Alluvial plain of Haw River. 11 miles West of Chapel Hill, 20 September 1966, *DuMond 322* (NCSC!); Austin Quarter, ca. 79 degrees 16'12"W, 35 degrees 55'N., 35.916667 N, 79.27 W, 9 September 2003, *McCormick & Peifer 77* (NCU!); 5.5 mi. sw. of Swepsonville and 3.5 mi. se. of Bellemont, 29 September 1956, *Ramseur & Hammond 2225* (CM!); 10.5 mi. w. of Chapel Hill, 11 mi. e. of Snow Camp along w. bank of Haw River, 22 September 1956, *Ramseur & Hammond 2130A* (NCU!); Alexander County: Gneiss, Middle Little River, 7 miles sw. of Taylorsville, 15 September 1956, *Radford 18154* (NCU!); Alleghany County: Blue Ridge Parkway, Doughton Park, 1 September 1964, *Mullen, L. Alfred 596* (NCSC!); NC. 18 near Little River, 6 miles ne. of Sparta, 27 September 1958, *Radford 40871* (NCU!); Anson County: Pee Dee on N.C. 85, 21 September 1956, *Ahles & Leisner 19214* (NCU!); Ashe County: foot of Nigger Mountain [sic; Mount Jefferson], 1 mile sw. of West Jefferson, 28 September 1958, *Radford 41105* (NCU!); Avery County: Rockhouse Creek, 1.8 miles north of Edgemont on road to Linville., 24 September 1958, *Ahles & Duke 49620* (NCU!); Collected in old apple orchard off of road 464A., 2 August 1986, *Bradshaw s.n.* (NCSC!); Beaufort County: Along railroad track 1 mile north of Pinetown, 26 August 1966, *Blair 1089* (NCSC!); Washington Park, 11 October 1958, *Radford 42024* (NCU!); Bertie County: 1.8 mile north of Conine Creek on U.S. 17, then 2 miles east-southeast., 28 October 1958, *Ahles & Haesloop 52101* (NCU!); 1.3 miles north of Conine Creek on US. 17 (south-southwest of Windsor)., 28 October 1958, *Ahles & Haesloop 52013A* (NCU!); Brunswick County: Orton, 8 October 1941, *Godfrey 10136* (NCU!); Boiling Springs Lakes Preserve, Beaver Dam Quad., 34.0229 N, 78.02845 W, 20 September 2006, *Morris 0952006-07* (NCU!); Smith's Island, N.C., 11 September 1929, *Wells s.n.* (NCSC!); Burke County: Mouth of Linville River, 17 August 1923, *Alexander s.n.* (NCU!); Cabarrus County: 6.4 miles south-southeast of Harrisburg, 3 miles southwest of town of Rocky River., 23 September 1956, *Ahles & Leisner 19745* (NCU!); Carteret County: Bogue Barrier woods, 4 mi. west of Atlantic City, 15 September 1959, *Burk, Crutchfield, Hammond & Williamson b32-12* (NCU!); Bogue Bank, 8 ml. W of Atlantic Beach., 15

September 1964, *Phipps, MacInnes & Lubke 3695* (NCU!); Caswell County: Dan River Terrace. 3 miles west of Milton, N.C. NC 62 NW to SR 1530 to Cane Creek, 13 September 1986, *Kindell 224* (NCSC!); East side of Country Line Creek in Caswell Game Lands off Gatewood Road (SR 1780), E of Yanceyville, S of US 158/NC 86, 36.40127 N, 79.29638 W, 30 August 2020, *McCormick & Peifer s.n.* (NCU!); Catawba County: at Murray Mill [sic; Murray's Mill], on Ball Creek 2 miles southwest of Catawba., 9 August 1958, *Bell 14737* (NCU!); .5 miles ESE of US 64-70, on Startown Road, (Just south of Hickory), 14 September 1978, *Solomon & Solomon 3971* (CM!); Chatham County: Northeast corner of intersection between White Cross Road and Crawford Dairy Road., 35.851861 N, 79.194433 W, 16 September 2016, *Schoonover, II 85* (NCU!); White Pines Natural Area: to the east of the parking area in the power line, 4 September 1989, *Swab 819* (NCSC!); off of Lystra Rd., about 8 mi. south of Chapel Hill, NC, 22 September 1981, *Trant 28* (NCU!); Cherokee County: near US. 64 and Hiwassee River, 31 August 1956, *Radford 17351* (NCU!); about 3 miles northwest of Murphy., 25 August 1955, *Wilbur 4566* (NCSC!); Chowan County: 1.6 mile east of Chowan River on U.S. 17 (west of Edenton)., 14 October 1958, *Ahles & Duke 50923* (NCU!); on U.S. Rt. 17, 2 mi. w. of Edenton, 6 October 1950, *Fox & Godfrey 4408* (NCSC!); Clay County: Chatuge Lake, 3 1/2 miles east of Hayesville, 21 August 1956, *Radford 16341* (NCU!); Cumberland County: at Fish Hatchery on U.S. R. 15A, 10 mi. s.w. of Fayetteville., 15 September 1950, *Fox & Godfrey 4208* (NCSC!); Currituck County: Poplar Branch Township, NC Highway 12 in Corolla, near the intersection with Schoolhouse Lane, 36.37811667 N, 75.82955 W, 21 September 2018, *Holdsclaw 887* (NCU!); Dare County: Buxton Woods, near Nature Trail, Hatteras I. [Island], 2 September 1960, *Burk, Crutchfield, Hammond & Williamson b55-2* (NCU!); Kitty Hawk Woods Coastal Reserve Powerline corridor at the Eckner St bar gate., 36.082891 N, 75.715708 W, 26 October 2016, *Flood 55* (NCU!); Nags Head Woods Ecological Preserve: Kill Devil Hills / Nags Head, 13 October 2005, *Krings 1321* (NCSC!); Nags Head Woods Ecological Preserve: Kill Devil Hills / Nags Head, 13 October 2005, *Krings 1320* (NCSC!, NCU!); Davidson County: 0.7 miles west of Davidson-Randolph Co. line on U.S. 64, 14 September 1956, *Ahles & Leisner 18544* (NCU!); just east of Grassy Fork creek. From NC Hwy. 49/109 intersection, follow the former south 1+ miles, then left on SR 2545 to merger with SR 2544 and Grassy Fork; follow creek about 3/4 miles south., 12 September 2002, *Diamond 1572* (NCU!); Duplin County: 2.6 miles east of Faison, 3 October 1957, *Ahles 35732* (NCU!); 2.6 miles east of Faison, 3 October 1957, *Ahles 35732A* (NCU!); Durham County: northeast of Durham on Neuse River at Co. line (sw. of Cozart), 21 August 1965, *Ahles & Sears 59761* (NCU!); Chapel Hill Nursery, 3 mi. s. of Chapel Hill, Durham Co, 9 October 1940, *Fosberg 17674* (NCSC!); Edgecombe County: near Whiteoak Swamp, 2.5 miles nw. of Leggett, 23 September 1958, *Radford 40650* (NCU!); Forsyth County: 1.5 mile north-northeast of Winston-Salem on old U.S. 311., 23 October 1958, *Ahles & Haesloop 51619* (NCU!); Franklin County: 2.7 miles west of Nash-Franklin County line on N.C. Rt. #56., 5 October 1956, *Ahles & Leisner 20581* (NCU!); Gaston County: 3.5 miles west of Catawba River on U.S. 29., 17 September 1956, *Ahles & Leisner 18777* (NCU!); Gates County: Chowan River about 5 miles north northwest of Eure., 26 June 1958, *Ahles & Duke 44702* (NCU!); between White Oak Pocosin and Chowan River., 16 October 1958, *Duke & Ahles 3616* (NCU!); Granville County: Fox Creek, about 2 miles southwest of Hebron., 28 September 1956, *Ahles & Leisner 20113* (NCU!); Picture Creek, Butner, NC, 36.1585 N, 78.740418 W, 20 August 2016, *Schoonover, II 74* (NCU!); near a shaft at the Blue Wing Mine. Mine is 0.3 mile behind the Blue Wing Baptist church. A small trail leads north-west to the mine from a point on 1332 0.7 mile east of the junction of 1332 and Highway 49., 13 August 1979, *Wickland 2192* (NCU!); Greene County: 1 mile nw. of Arba, 13 September 1958, *Radford 40415* (NCU!); Guilford County: at mouth of Richland Creek, Guilford Co., N.C., 14 September 1955, *Melvin s.n.* (NCU!); Richland Creek, 22 September 1955, *Melvin s.n.* (NCU!); Halifax County: Medoc Mountain State Park: Stream Loop Trail, 16 September 1995, *Floyd 714* (NCSC!); Harnett County: 2.8 miles south of Harnett-Lee County line on NC 87. (Approx. 1.6 miles south of Olivia)., 4 October 1956, *Laing Chambers 436* (NCU!); Haywood County: 1 mile south of Crabtree on NC 209., 7 October 1958, *Ahles & Duke 50335* (NCU!); Henderson County: on Green River rd. 2 mi. w. of Tuxedo, 24 August 1951, *Fox 5319* (NCSC!); Flat Rock, N.C., 17 September 1885, *Memminger s.n.* (NCU!); about 6 miles southeast of East Flat Rock on Rt. 176., 2 September 1955, *Wilbur 4962* (NCSC!); Hertford County: 2 miles southwest of Como on U.S. 258, then 1.5 miles southeast on dirt road., 29 October 1958, *Ahles & Haesloop 52267* (NCU!); Hoke County: 0.3 mile southwest of Ashley Heights, 10 October 1957, *Ahles 36338* (NCU!); Iredell County: 4 miles east of Hustonville [sic; Houstonville], then 2.9 miles south on branch of Hunting Creek., 24 October 1958, *Ahles & Haesloop 51970* (NCU!); Expt. Station; Statesville, Iredell Co., N.C., 13 September 1934, *Veerhoff 119* (NCSC!); Johnston County: 1/2 mi. w. of Neuse R., e of Wilson Mills, 22 September 1950, *Fox, Godfrey & Boyce 4304* (NCSC!); Home of B.E. Smith, Johnston Co., NC., 14 September 1932, *Smith s.n.* (NCU!); Jones County: near Trent River, 3.8 miles east of Combs Fork., 9 September 1958, *Radford 40002* (NCU!); on Trent River, n.e. of Pollocksville., 4 October 1953, *Radford, Haesloop & Miller 7701* (NCU!); Lee County: 1.3 miles west junction of Deep and Haw Rivers., 11 September 1954, *Beard 161* (NCU!); South of Deep River, 2 mi. west of Moncure, 7

October 1974, *Indorf 128* (NCU!); Lenoir County: .5 miles east of Liddell., 24 October 1957, *Radford 31677* (NCU!); Lincoln County: NC 273 about 5 miles northwest of Lowesville., 10 September 1958, *Bell 15362* (NCU!); Macon County: Corveeta [sic; Coweeta] Experimental Forest. Macon County, North Carolina., 19 August 1938, *Hechenbleikner s.n.* (NCU!); 1/2 mile SW of Ellijay., 20 August 1947, *Radford s.n.* (NCU!); on Reck's farm, 3 miles from Macon, N.C., 29 August 1933, *Scholz s.n.* (NCU!); south of Short-off Mt., Macon County, N.C., 12 September 1932, *Stockton s.n.* (NCU!); Madison County: 0.15-0.8 km (0.1-0.5 mile) SW of state route 212 on U.S. Forest Service Road 275; SW of the town of Rocky Fork, Tennessee., 3 September 1979, *Boufford & Wood 21819* (CM!); Martin County: on N.C. Rt. 125, at Conoho Creek, e of Hamilton, 23 September 1950, *Fox, Godfrey & Boyce 4375* (NCSC!); near Conoho Creek, 4 miles SW of Hamilton., 11 October 1958, *Radford 41899* (NCU!); Conoho Creek, 4.5 miles NW of Williamston., 30 September 1966, *Radford & Bozeman 45284* (NCU!); Mecklenburg County: 2.4 miles west of Cabarrus-Mecklenburg County line on NC 49, then 0.9 miles northwest., 2 October 1958, *Ahles & Duke 49953* (NCU!); Mitchell County: 2.6 miles south of Bakersville on NC 26., 25 September 1958, *Ahles & Duke 49816* (NCU!); Montgomery County: 2.5 miles east of Norman near Naked Creek., 9 October 1956, *Radford 19604* (NCU!); Moore County: 2 miles east of Vass, 12 October 1957, *Burk 25-2* (MU!); Weymouth Woods Sandhills Nature Preserve Boyd Tract, 35.1675 N, 79.375278 W, 24 September 2017, *Peifer s.n.* (NCU!); Weymouth Woods Sandhills Nature Preserve main section of preserve, 35.15 N, 79.37 W, 24 September 2017, *Peifer s.n.* (NCU!); Pinehurst, N.C., 14 September 1931, *Wicker s.n.* (NCU!); Nash County: 1.5 miles east of Bailey on U.S. Rt# 264., 15 October 1956, *Ahles & Leisner 21198* (NCU!); New Hanover County: Figure 8 Island., 20 September 1992, *Leys 46086* (WILLI!); Summer Rest Road, Wrightsville Sound., 14 September 1963, *McCrary 1167* (NCU!); Masonboro Island State Natural Area on spoil island, 34.189150 N, 77.826089 W, 17 October 2017, *Schoonover, II, & Addison 116* (NCU!); Northampton County: 0.7 mile north of Worrells Mill Pond (southeast of Severn)., 30 October 1958, *Ahles & Haesloop 52423* (NCU!); Onslow County: 1.8 miles northeast of Jacksonville on US 17., 4 October 1957, *Ahles 35919* (NCU!); Orange County: In the vicinity of Chapel Hill, North Carolina., July 1898, *Ashe s.n.* (NCU!); Side walk in front of Dr. Wagstaff's., 1 October 1914, *Coker s.n.* (NCU!); about 100 yards east of east gate of campus, 14 September 1914, *Coker s.n.* (NCU!); Chestnut Ridge Church Rd, From Chestnut Ridge Church, drive 0.8 miles NE. Pop. In meadow on left, 36.046707 N, 79.180976 W, 31 October 2016, *Dakar 208* (NCU!); In Sparrow's pasture below bridge. Chapel Hill, Orange County, NC., 25 September 1944, *Gentry 12* (NCU!); Hunt arboretum Grid 20 Elevation 80m Aspect: F; N side of Morgan Creek, sewer road., 9 September 1990, *Larke 1528* (NCU!); west side of Orange Chapel Clover Garden Road (SR1956), just S of its junction with Millikan Rd (SR1959), 35.903026 N, 79.242547 W, 8 September 2018, *Peifer & McCormick s.n.* (NCU!); near bank of Bolin Creek, just north of Carrboro, NC, along R.R [railroad]., 19 September 1939, *Radford & Stewart 15a* (NCU!); In piedmont habitat garden at the North Carolina Botanical Garden. Group of plants on west side of path., 35.898963 N, 79.033303 W, 30 August 2016, *Schoonover, II 75* (NCU!); In piedmont habitat garden at the North Carolina Botanical Garden. Group of plants on east side of path., 35.898963 N, 79.033303 W, 30 August 2016, *Schoonover, II 76* (NCU!); Along fence at southern end of North Carolina Botanical Garden piedmont habitat garden, 35.898784 N, 79.032986 W, 30 August 2016, *Schoonover, II 77* (NCU!); On north side of Chestnut Ridge Church Road, Efland, NC, around Sycamore tree., 36.046707 N, 79.180976 W, 6 September 2016, *Schoonover, II, & McCormick 78* (NCU!); On north side of Chestnut Ridge Church Road, Efland, NC, around Sycamore tree., 36.046707 N, 79.180976 W, 6 September 2016, *Schoonover, II, & McCormick 79* (NCU!); On east side of Buckhorn Road, Efland, NC, just south of Minka Farm Lane., 36.030927 N, 79.208451 W, 6 September 2016, *Schoonover, II, & McCormick 80* (NCU!); Pender County: 8.6 miles south of Player (2.8 miles north of NC 210)., 5 October 1957, *Ahles 36252* (NCU!); near route N.C. 210 bridge over Harrison's Creek., 24 September 1974, *Sieren 1863* (NCU!); Person County: Flat River, Highway 501., 4 October 1957, *Bowmer 217* (NCU!); Pitt County: near Coetoe Creek and US 264, 4 miles west of Bethel., 9 October 1958, *Radford 41648* (NCU!); Polk County: SW of junction of Cove Creek and Green River., 5 September 1973, *DuMond 1792* (NCSC!); Tryon. Polk County., 27 August 1921, *Peattie 1406* (NCU!); Randolph County: by US 64, 1.6 miles west of Chatham County line., 10 October 1958, *Bell 15513* (NCU!); Richmond County: 2 miles SW of Marston near US 1. NC 77 Junction., 6 October 1956, *Radford 19295* (NCU!); Robeson County: 2 miles NNE of St. Pauls along V & CS RR [railroad]., 27 September 1958, *Britt 2614* (NCU!); Rockingham County: 1.5 miles east of Thompsonville near NC 87., 28 September 1956, *Radford 18485* (NCU!); Rowan County: where NC 601 crosses the South Yadkin River., 6 October 1956, *Horton 455* (NCU!); Rutherford County: 2 miles east of Lake Lure., 10 September 1956, *Freeman 56717* (NCU!); Sampson County: on NC 41 near Black River., 14 October 1951, *Radford 5961* (NCU!); Scotland County: 1.5 miles east southeast of Old Hundred on US. 74., 16 October 1957, *Ahles 36959* (NCU!); co. road 1407, at jct. with co. road 1434, 1 November 1973, *Sharp 2425* (NCU!); Stanly County: Long Creek Near Albmarle on N.C. 27., 24 September 1956, *Ahles & Leisner 19782* (NCU!); Surry County: Yadkin River near Elkin., 16 September 1956, *Radford 18343* (NCU!); Swain County: Cherokee, near road, 16 August 1952, *Banks*

16746 (NCU!); Great Smoky Mountains, 10 August 1891, *Beardslee & Kofoid* (MU!); Transylvania County: on east side of Toxaway River, Toxaway River Gorge., 10 August 1961, *Cooper 2397* (NCSC!); n. end of old Lake Toxaway bed, 27 August 1951, *Fox & Godfrey 5424* (NCSC!); U.S. highway 276 near the Pink Beds Recreation Center., 23 September 1957, *Freeman 57817* (NCU!); Union County: 3 miles north of junction US. 601 and 74 on US. 601 (between Fairview and Monroe)., 17 September 1957, *Ahles 33964* (NCU!); Vance County: 1 mile northeast of Tungsten., 1 October 1956, *Ahles & Leisner 20305* (NCU!); Wake County: on rd. to Duncan, s.w. of Fuquay Springs, just inside Wake Co., 16 October 1948, *Fox & Godfrey 2089* (NCSC!); Richland Creek forest west of Raleigh., 25 September 1944, *Kampman s.n.* (NCSC!); WC. 1900, 2 miles west of NC 50., 24 September 1966, *Pultorak 98* (NCSC!); Plants of Umstead State Park; Powerline, 5 September 1964, *Sawyer, George P. & Ahles 1706* (NCU!); Harris Lake County Park, 35.620994 N, 78.939406 W, 17 September 2017, *Schoonover, II, & McClelland 106* (NCU!); Camp Durant: on dam of lower lake, 11 September 1981, *Skean, Jr. 659* (NCSC!); Camp Durant: just southeast of Training Lodge, 29 September 1981, *Skean, Jr. 714* (USCH!); Washington County: near Old US. 64, 4 miles ne of Plymouth., 18 October 1958, *Radford 42451* (NCU!); Watauga County: 1 mile west northwest of Watauga-Wilkes Co. line on US. 421, then 0.3 mile southwest., 23 September 1958, *Ahles & Duke 49255* (NCU!); Wayne County: Cliffs of the Neuse State Park: next to oak-pine stand and trash dump in State Park., 12 September 1967, *Bruton 415* (NCSC!); Cliffs of the Neuse State Park: 300 yds. From State Park Entrance Gate., 22 September 1967, *Bruton 450* (NCSC!); 4 miles east of Dudley., 28 August 1957, *Radford 28764* (NCU!); Wilkes County: At Kerr Scott Reservoir and Warrior Creek 2 mi NW of Boomer on Co Rd 1122; at camping area., 15 September 1971, *Downs & Smith 12400* (NCSC!); Stone Mt. State Park: near the superintendent's home, 24 August 1971, *Taggart 108* (NCSC!); Wilson County: near US 264, 0.3 miles W of Sims., 25 September 1958, *Radford 40755* (NCU!); Yancey County: 2.3 miles east of Micaville and 2.4 miles south., 9 October 1958, *Ahles & Duke 50877* (NCU!); State highway 80 between Busick and Celo., 28 August 1958, *Freeman 58347* (NCU!); Ohio, Adams County: cemetery of Sandy Springs Baptist Church on Rt. 52, 7 October 1979, *Berlincourt 15* (MU!); In graveyard; Sandy Springs, Ohio, 14 October 1974, *Bryant 207* (MU!); Sandy Springs; near cemetery, 14 September 1975, *Bryant 310* (MU!); Sandy Springs Cemetery, 21 September 1952, *Harper 1795* (MU!); Growing in an old cemetery at the intersection of U.S. Route 52 and Sandy Springs Rd., near Sandy Springs, Ohio, 6 October 1979, *Shelly 33* (MU!); in the back portion of the Sandy Springs Baptist Cemetery. On the left side of the cemetery road., 7 October 1979, *Wuest 20* (MU!); Ashtabula County: SW. Poore Rd., 1/2 mi. N. US Rt. 20, North Kingsville, Kingsville Twp., 14 September 1979, *Cusick 19726* (MU!); Athens County: Bank of Onion Creek; Blicke Farm, State Route 681 and County Road 10; Lee Township, 29 September 1970, *Blickle s.n.* (MU!); 1.5 mile ESE of Nelsonville, along railroad R-O-W just north of Coe Hollow Rd. (=Happy Hollow Rd.), NW 1/4 of sec. 11, T12N, R15W., 39.451208 N, 82.198945 W, 3 September 1994, *Cantino 1368* (USCH!); Highland County: Paint Creek, 25 August 1910, *Hopkins s.n.* (CM!); Hocking County: Good Hope Township; 1/2 mile west of t-122 on 374. 11/4 airmiles SW of the center of RockBridge. 51/4 airmiles N of the center of Gibsonville. Collected at edge of road., 16 September 1979, *Bryant 1021* (MU!); N. St. Rt. 374, 0.49 mi. WNW. St. Rt. 180, NE 1/4, Sect. 9, Laurel Twp., 11 September 1979, *Spooner 172* (MU!); Jackson County: Milton Township, Section 15; 58 near 124. 2 airmiles NW of the center of Buckeye Furnace. 4.3 airmiles SE of the center of Wellston., 24 September 1978, *Bryant 891* (MU!); Miami County: 1/4-1/2 mi E of St Rt 721 at Bradford, Sec 22, Newberry Twp, 1 October 1996, *Cusick 33500* (CM!); on S. side of Penn Central RR tracks; 1/2-1 mi. ESE. St. Rt. 721 at Bradford, Sect. 22, Newberry Twp., 8 September 1982, *Cusick 22096* (MU!); Muskingum County: Salem Twp., 3 September 1950, *Buker s.n.* (CM!); Muskingum County, 1 September 1947, *Buker s.n.* (CM!); Noble County: below cemetery, Twp Rt 242, N of Twp Rt 145, E of Harrietsville, Sect 26, Elk Twp, 25 September 1991, *Cusick & Ortt 29950* (CM!); Perry County: E of Sunday Creek, just S of Twp. Rd. 283., 24 August 1983, *Young s.n.* (MU!); Portage County: near Kent, Summer 1910, *Hopkins s.n.* (CM!); Oklahoma, Atoka County: Boehler Seeps, north of Fox Hollow Rd, about 500 m (air) south-southeast of Hassell Lake, about 16 km (air) north-northwest of Boswell, 34.1723 N, 95.8891 W, 24 October 2009, *Fishbein, Malahy & Richardson 6387* (ARIZ!); Pennsylvania, Allegheny County: Allegheny Co PA, s.d., *Kuip s.n.* (CM!); Pittsburgh, Bruno Island, Ohio River, 1.2 km S of McKees Rocks bridge, 12 August 1996, *Smith & Hawk 74* (CM!); Peters Creek above Large, 20 September 1942, *Wurdack s.n.* (CM!); Bedford County: 1/2 mi. N. Hyndman, 2 September 1940, *Berkheimer 2204* (CM!); Pa. Turnpike near Breezewood, 1 September 1948, *Buker s.n.* (CM!); along railroad tracks, Bedford, 15 September 1951, *Henry & Buker s.n.* (CM!); along Sidelong Hill Cr., 1.5 mi. N of Barnes Gap, 13 September 1952, *Henry & Buker s.n.* (CM!); Blair County: along railroad, ca 0.4 mile NW of Pinecroft, 8 September 1983, *Kunsmann 6095* (CM!); along railroad tracks, ca 0.6 mile ESE of Bald Eagle, 23 August 1987, *Kunsmann 9095* (CM!); Bucks County: Trenton cut-off Pa. R.R. ca 1 mi. n.w. of Feasterville, 8 September 1960, *Long 86788* (CM!); Monroe, 3 September 1888, *Ruth & Ruth s.n.* (MU!); Cambria County: 2 mi. S of Nicktown, 15 August 1954, *Kline s.n.* (CM!); Centre County: ca 0.4 km W of Spring Mills along Sinking Creek., 24 August 2002, *Isaac 15698* (CM!);

Near Spring Mills, Sinking Creek prairie., 14 August 1990, *Stack 96* (CM!); 1 1/2 mi. w.s.w. of SPRING MILLS, 15 August 1956, *Wahl 17942* (NCU!); Chester County: Unionville, 24 August 1883, *Seal s.n.* (CM!); Dauphin County: 1&7/8 mi. e.s.e. of Millersburg, 7 August 1952, *Berkheimer 14544* (CM!); Elk County: rt. 949, 1.9 mi. S. of Ridgway, 3 October 1972, *Buker s.n.* (CM!); Two mi. S of Carman, State Game Lands 44; along Toby Cr., 13 September 1983, *Grisez 660* (CM!); Spring Creek Township, ca 2.5 km SSW of Croyland, along Clarion-Little Toby Trail., 18 September 2003, *Isaac 17281* (CM!); Erie County: Manchester west of Erie, 1 September 1879, *Guttenberg 251* (CM!); Fulton County: Sidelong Hill Creek, N side at Mason and Dixon Line, Union Twp., 4 September 1992, *Bier s.n.* (CM!); near state line, 2 September 1918, *Bright 6045* (CM!); Along Patterson's Run, Dane, 25 August 1917, *Gress s.n.* (CM!); at DAMASCUS CHURCH, 8 October 1954, *Westerfeld 13008* (NCU!); Greene County: Whitely Twp., 17 September 1921, *Dickey s.n.* (CM!); ca 2.5 km SE of Bobtown, Dunkard Township, 8 September 2008, *Paxton s.n.* (CM!); Huntingdon County: Mt. Union, 3 September 1920, *Gress s.n.* (CM!); Pogue; along Aughwick Creek, 28 September 1946, *Long s.n.* (CM!); Coles Summit, abt. 2.5 mi. NW of Saltillo, 1963, *Pearth s.n.* (CM!); Jefferson County: Five mi. north of Brooksville, 3 September 1934, *Young s.n.* (CM!); Lackawanna County: Taylor, W of Lackawanna River, 41.394722 N, 75.685 W, 29 September 2005, *Isaac & Takacs 18969* (CM!); Lancaster County: Lancaster Co., Pa., July 1884, *Aschman s.n.* (CM!); Lancaster Co., Pa., June–August 1886, *Galen 1976* (CM!); Lancaster Co., Pa., June–August 1886, *Galen 1976* (CM!); at Jenkins Corner, 3/4 mile north of the Maryland - Pennsylvania state line, off route 72., 19 September 1963, *Miller #6-29* (NCU!); Lawrence County: West of Ellwood City, Rock Point, confluence of Connoquenessing Creek and Beaver River., 22 August 2006, *Harrison, Grund, Zimmerman & Parker 572* (CM!); along McCleary Rd., 1 mi. S of bridge over Neshannock Cr., below falls, 21 September 1957, *Henry & Beer s.n.* (CM!); Robinson, near mouth of Coffee Run, Mahoning Township., 41.026944 N, 80.498333 W, 27 August 2005, *Isaac & Isaac 18915* (CM!); Lebanon County: 0.5 mi. S. of Twin Grove Park, 10 September 1959, *Keener 851* (CM!); Lehigh County: near Bethlehem, 1840, *Wolle s.n.* (CM!); Lycoming County: Waterville - Little Pine Creek, 5 September 1921, *Bright s.n.* (CM!); Monroe County: Buck Hill Falls, 28 August 1928, *Jennings s.n.* (CM!); Northampton County: Upper Mt Bethel Twp. Stroudsburg Quadrangle. 2.43 miles NNE of North Bangor, PA. SE facing ... slope of Blue Mountain, 40.938235 N, 75.179621 W, 29 August 2012, *Gleason & Eichelberger FI2GLE90-C* (CM!); Island Park, in the Lehigh, above Easton, Pa., 30 August 1900, *Porter s.n.* (CM!); Pike County: Abandon Road, 41.434722 N, 75.173333 W, 22 August 2004, *Tracey 2004-0017* (CM!); Wayne County: Near Irving Cliff, Honesdale, 21 August 1920, *Jennings, Jennings & Gress s.n.* (CM!); Westmoreland County: ca 0.25 mi E of Hitchison, s.d., *Koch s.n.* (CM!); Hempfield Township, 0.5 mi SSW of Midway along Jacks Run and Conrail tracks, 11 September 1992, *Utech 92-2814* (CM!); Mount Pleasant Township, 1 mi SW of Brinkerton on PA 2012 at Big Sewickley Creek., 17 August 1994, *Utech 94-2011* (CM!); Wyoming County: at s. end of bluff, 1 mi. s.s.e. of Skinners Eddy, 30 August 1947, *Glowenke 10433* (CM!); Rhode Island, Providence County: Rhode Island Avenue, 20 August 1894, *Miller s.n.* (CM!); Washington County: Charlestown Beach, 5 September 1938, *Correll & Correll 10568* (NCSC!); Westerly, R.I., 1 September 1919, *Weatherby 4563* (NCSC!); South Carolina: S.C., September, *Anonymous s.n.* (USCH!); Aiken County: 0.3 miles east of junction US 1-76 and SC 254 on US 1-76 (between North Augusta and Aiken)., 27 October 1961, *Ahles & Crutchfield 55093* (NCU!); At the powerline between roads A-1 and A-2, Savannah River Site., 24 September 1987, *Angerman s.n.* (NCU!, USCH!); next to path along railroad, Road A-2; Savannah River Site, 7 October 1987, *Angerman s.n.* (USCH!); Station 54: 2.65 miles from Bush (railroad) turn west and proceed 0.7 mile to edge of swamp, 8 October 1951, *Kelley s.n.* (USCH!); Station 5: Upper Three Runs Creek at Memorial Branch, 1 mile southwest of Station No 4 on state highway 781, 3.5 miles southeast of Talatha, 24 September 1951, *Kelley s.n.* (USCH!); 0.4 miles N of junction Hwy 25 and I20., 22 September 1971, *Massey & Massey 3022* (NCU!); Milletville, S.C., s.d., *McNell 1* (USCH!); Aiken SC, September 1856, *Ravenell s.n.* (USCH!); Allendale County: Coosawhatchie River, 3.4 miles southeast of Fairfax on Co. 21., 11 September 1956, *Ahles & Bell 18386* (NCU!); Anderson County: the Savannah River; just south of mouth of Big Generostee Creek. Site #83 (Lat. 34 20'25"; Long. 82 47'37"), ca. 1.1 mile north of the SC 181 bridge over the Savannah River. Below the 475-ft. contour (full pool for proposed Russell Lake). Area to be impounded in mid-1980's by US Army Corps of Engineers., 34.340278 N, 82.793611 W, 20 September 1979, *Credle, Fairey, III, & Douglass 2593* (NCU!); Bamberg County: 1.5 miles southeast of junctin Co. 49 and 17 and Co. 49 (northeast of Denmark)., 24 October 1957, *Ahles 37564* (NCU!); Barnwell County: Bwl. State Park, 6 October 1956, *Porter 319* (USCH!); Beaufort County: on northwestern Callawassie Island, 23 September 1981, *Aulbach-Smith 1874* (USCH!); 1.5 miles east-south-east of Yemassee on County Hwy. 33., 6 September 1956, *Bell 4718* (NCU!); SC 170 at Chechesee River. Boat Ramp; Ca. 10 mi W of Beaufort., 26 October 1992, *Horn, Turner & Mitchell 6306* (MU!); Harbor Island, 12 mi E of Beaufort, 7 October 1972, *Thomas 468* (CM!); Berkeley County: 3.2 miles southeast of Berkeley-Orangeburg Co. line on US 176., 28 September 1957, *Ahles 35429* (NCU!); Yeamans Hall Club: 900 Yeamans Hall Road, Hanahan. From gatehouse take Club road for 7/10 of mile. Left onto Goose Creek Trail. Continue on trail for 4/10 of mile. ... growing

in meadow between #3 green and Goose Creek., 13 November 2004, *deSaussure 32* (USCH!); 1.5 miles east of Honey Hill fire tower., 18 October 1968, *Leonard & Radford 2159* (NCU!); Calhoun County: 1.3 miles west northwest of junction Co. 72 and SC 33 on Co. 72 (north of Creston)., 27 September 1957, *Ahles 35313* (NCU!, USCH!); old farm site on E angle of jct formed by SC 6 and Sec Hwy 44, about 3 mi SE of St. Matthews within Wannamake Nature Preserve, 28 September 2001, *Nelson 22335* (USCH!); Charleston County: Francis Marion National Forest. Walk Sewee Trail to Shell Ring. Area is near the Atlantic Intracoastal Waterway, 3 October 2000, *Pittman & Darr 10030001* (USCH!); at See Wee Trail in Frances Marion National Wildlife Refuge, 15 miles from Mt. Pleasant, 20 September 1997, *Reeves 14* (USCH!); Sewee Shell Ring, 16 February 1993, *Stalter s.n.* (USCH!); Cherokee County: 0.5 miles west southwest of junction US 29 and County 52, then 0.7 miles northwest on dirt road., 18 September 1957, *Ahles 34222* (NCU!); U.S. highway 29 at the Broad River., 14 October 1957, *Freeman 57861* (NCU!); Chester County: Fish Dam Battle marker, Broad River Bridge, southwest of Chester., 18 September 1957, *Bell 9994* (NCU!); N of Sumter National Forest road 301E along trail. Forest Service Compartment 3. Ca. 14 mi W of Chester., 24 October 1992, *Horn 6243* (USCH!); Chesterfield County: at bridge over Bear Creek on east side of Sec Hwy 166, about 0.3 miles south of junction with Sec Hwy 79; about 5 miles north of Patrick, 30 September 2011, *Nelson 30176* (USCH!); Lynches River near U.S. 601, sw. of Pageland., 29 September 1956, *Radford 18797* (NCU!); 4 miles north of Chesterfield near S.C. 85., 29 September 1956, *Radford 18902* (NCU!); Clarendon County: Cuddo unit of Santee National Wildlife Preserve., 28 September 1982, *Logue 5735/82* (USCH!); Colleton County: Airy Hall Plantation, just north of S-26, ca. 10 miles southeast of junction with US 17 in Ashepoo, 3 October 1981, *Aulbach-Smith, Smith & Andrejko 1977* (USCH!); 0.7 miles from junction with County Hwys. 39 and 21, on S.C. Hwy. 61., 5 September 1956, *Bell 4646* (NCU!); Bear Island Wildlife Management Area, Bear Island, near Ashepoo River; Terminus of Bear Island Road, 29 September 1991, *Hill 22661* (CM!, USCH!); Darlington County: By railway track at Paper Mill Hartsv [Hartsville], 26 August 1909, *Anonymous s.n.* (NCU!); along Sal., Prestwood lake north of Hartsville., 12 August 1920, *Norton s.n.* (NCU!); Coker College Arboretum garden., 1 June 1940, *Smith 213* (NCU!); back of Mr. Paul Rogers at Hartsville., 25 September 1940, *Smith 1188* (NCU!); on Witherspoon Island., 15 September 1940, *Smith 1272* (NCU!); Sandy east flats along Lynches' River near Clyde., 10 September 1940, *Smith 1273* (NCU!); along S.A.L.R.R. west of Hartsville near the golf course., 16 September 1940, *Smith 1274* (NCU!); Dillon County: 1.5 miles south southeast of junction Co. 70 and SC. 57 on Co. 70 (north corner of county)., 17 October 1957, *Ahles 37064* (NCU!); Dorchester County: 1 mile east of Orangeburg-Dorchester County line on County Rt. 143 (along Edisto River)., 25 October 1957, *Ahles & Haesloop 37865* (NCU!); on N side of US 178 at west side of Four-Hole Swamp, 7.7 road mi SE of downtown Harleyville, 33.1426 N, 80.3511 W, 14 October 2013, *Nelson, Bennett & Tufford 32583* (USCH!); Edgefield County: Sumter National Forest Horn Creek Analysis Area: Compartment 308, Stand 18; about halfway between Miller Road and Rock Creek on E side of Lick Fork Lake, 15 September 1996, *Nelson 17814* (USCH!); at Sadler's Lake, S-75 NE of Trenton., 25 August 1989, *Nelson & McLemore 8330* (NCU!); Fairfield County: 1.7 miles east of Salem Crossroads (ca. 8 mi. west of Winnsboro)., 17 September 1957, *Bell 9880* (NCU!); W side of S-35; just E of Broad River and S of SC 213, 5 September 1989, *Nelson 8387* (USCH!); Florence County: se. of Lucille on Co. Rt. 46., 18 October 1957, *Bell 10819* (NCU!); on Lowder's Road near Little Creek, south side of Back Swamp 9creek) on west side of Georgetown Road, 7 air miles northeast of downtown Florence, 34.2862 N, 79.7062 W, 23 September 2008, *Nelson & Williamson 27370* (USCH!); Lynches R. P. 2 m SW Effinham, 25 October 1984, *Swails 84/404* (USCH!); Georgetown County: Tom Yawkee Wildlife Center: NE of recreation hall, and N of machine shop and main office., 28 August 1990, *Nelson 9699* (USCH!); Tom Yawkee Wildlife Center: just N of old fort along Goose Blind Rd; South Island., 25 October 1990, *Nelson 9965* (USCH!); at edge of lawn (old plantation site) at bluff overlooking Waccamaw River; 3000 m N of (355d) traffic circle at Brookgreen Gardens, between Litchfield and Murrells Inlet, 33.5427 N, 79.0921 W, 29 September 2000, *Nelson 21528* (USCH!); along dirt road just behind (W of) old campground near Atalaya Castle, Huntington Beach State Park, S side of Murrells Inlet, 33.5009 N, 79.0712 W, 12 August 2005, *Nelson 25540* (USCH!); Tom Yawkee Wildlife Center: next to old boat landing on NW/SE spit of land at marsh, N end of North Island, 2.8 mi S of North Inlet., 26 September 1991, *Nelson & Cely 11551* (USCH!); Sandy Island: E edge of Brown Cr. Swamp at site of hunting cabin (torn down); 1.5 air mi NNW of Belin., 19 September 1997, *Nelson & Cely 18604* (USCH!); Sandy Island: on E side of Indian Lake swamp on S edge of Poachers Point, just S of Little Bull Creek; 1.75 mi and 305d NW of northern-most point of Vaux Island, 29 August 1998, *Nelson & Cely 19807* (USCH!); Tom Yawkee Wildlife Center: about 2.5 mi S of North Inlet, E side of North Island., 24 October 1990, *Nelson & Desportes 9933* (NCU!, USCH!); Tom Yawkee Wildlife Center: next to road immediately north of main house at Blackout Plantation; Cat Island, 4 September 1992, *Nelson & Kennemore 13443* (USCH!); 6 miles south of Sampit., 23 August 1957, *Radford 28656* (NCU!); Gate near fire break in back of Tarbox office [Brookgreen Gardens], 9 September 1970, *Stalter 70.781* (USCH!); [Brookgreen Gardens], 3 November 1933, *Tarbox, F. G. 33.033* (USCH!); Greenville County: New Circle

Road, 34.981983 N, 82.466033 W, 10 September 2005, *Marlow s.n.* (USCH!); Hogback Mt. northeastern corner of Greenville Co. 3,000 ft., 16 November 1926, *Peattie 2405* (NCU!); Hampton County: clearcut on N side of Sec Hwy 496 immediately E of Smith cemetery and Cow pen Branch, about 3 air mi NW of Horsegall, 15 September 2000, *Nelson 21521* (USCH!); Belmont Plantation, plot 087-0489, Porcher PhD., 1 November 1970, *Porcher, Richard D. 266* (USCH!); Horry County: adjacent to St. Rt. 501 just before entering North Myrtle Beach, 24 October 2001, *Baldwin, Sterling & Sterling 4187* (WILLI!); at 70th St. N. on US 17 at Myrtle Beach., 19 October 1957, *Duke 51* (NCU!); Jasper County: 0.4 miles southwest of Neue River on S.C. 170., 7 September 1956, *Ahles & Bell 18131* (NCU!); Lancaster County: 1.4 miles southeast of junction SC. 97 and 200 on SC. 97 (south south-west of Lancaster)., 20 September 1957, *Ahles 34760* (NCU!); “Forty Acre Rock” 2 miles south of Taxahaw., 7 October 1970, *Musselman 3972* (NCU!); Laurens County: pond by SC 72 near Co. line, e. of Clinton., 4 October 1957, *Bell 10245* (NCU!); Finley Property, 200 off Hwy 221 & SR 29., 5 September 1994, *Johnson 319* (USCH!); Lee County: near SC 341, 5.5 mi. west of Ashland., 3 October 1957, *Radford 29399* (NCU!); Lexington County: at Congaree area Girl Scout Camp; ca. 3 1/2 miles due SW of the jct. of S-302 and SC 6 in Edmund., 25 September 1980, *Aulbach-Smith & Hollowell 1241* (USCH!); at dam of Shealie’s Pond, S-279 just W of Edmund., 10 October 1989, *Nelson, Allard, Boyle & McLemore 8553* (USCH!); Cayce, 5 October 1957, *Radford 29710* (NCU!); Marion County: along Co. Rt. 49 ca. 15 mil S. of Britton Neck., 20 October 1957, *Bell 11018* (NCU!); From Columbia go East on HWY 378. After you cross Great Pee Dee River go about seven miles then right on unimproved road to the beginning of the property next to the lookout tower and Woodbury cemetery, 4 October 2006, *Pittman, Darr & Boyle 10040634* (USCH!); Marlboro County: 10 miles north of Bennettsville near S.C. 163-165 jct., 30 September 1956, *Radford 18947* (NCU!); McCormick County: Savannah River, near SC. 28, 6 miles se. of Clarks Hill., 13 October 1957, *Radford 30656* (NCU!); Newberry County: 2 mi ne Newberry, 19 September 1961, *Batson & Henry s.n.* (USCH!); Billy Dreher Island, 24 September 1970, *Buff, Jr. 49* (USCH!); Newberry Co. 44 at cut over woodlot 0.5 mi. W Newberry Co. 55. Ca. 9 mi. NE Newberry., 26 August 1986, *Horn 1199* (USCH!); Oconee County: near Cranes Creek, 3 miles north of Tamasee., 2 September 1956, *Radford 17842* (NCU!); Orangeburg County: 1.8 miles southeast of Santee on SC 9., 26 September 1957, *Ahles 34916* (NCU!); on S side of Sec Hwy 105, where Big Poplar Cr is impounded, between Elloree and Santee State Park, 0.5 mi W of Sec Hwy 82., 28 September 2001, *Nelson 22316* (USCH!); NW side of Branchville, 3.2 air mi from city center, just W of Cooner Cemetery on W side of Sec Hwy 117; Mead Westvaco forest land, 33.2872 N, 80.8447 W, 3 September 2004, *Nelson 25063* (USCH!); Webbs Creek. At private boat landing. From old number six hwy to SC-1973, turn by Captain Kirks Steak & Seafood sign. Follow road to boat landing., 33.4742 N, 80.4347 W, 26 September 2001, *Pittman & Darr 9260110* (USCH!); Pickens County: just e. of bridge on Keowee R., s. of Jocassee, 27 August 1951, *Fox & Godfrey 5405* (NCSC!); 12 Mile [sic; Twelvemile] Creek near S.C. 183 west of Pickens., 22 August 1956, *Radford 16646* (NCU!); Richland County: Fort Jackson Army Installation: S edge of Old Heises Pond near rec buildings, N of Semmes Rd., 24 September 1991, *Nelson & Kennemore 11515* (USCH!); Found on the edge of parking area 6 at the Stewardship Trail; Harbison State Forest is located 8 miles NW of Columbia, on the north side of Broad River Road., 34.149444 N, 81.164167 W, 22 October 1999, *Peterson 179* (USCH!); Sandhills Experiment Station - Clemson University: off main road past childrens garden across from pineland-sandhills area, 27 October 1998, *Sidran 124* (USCH!); Saluda County: 0.7 mi W of jct of Hwy 23 & 39 (W of Ridge Spring) and 0.2 mi S., 21 September 1971, *Massey & Massey 3001* (NCU!); near SC 23, 3 miles west of Ridge Spring., 12 October 1957, *Radford 30391* (NCU!); Spartanburg County: s. of New Prospect., 5 October 1957, *Bell 10397* (NCU!); W side of S-92 about 1 mi S of SC 215., 13 September 1989, *Nelson & Neary 8452* (USCH!); Sumter County: NE quadrant of “Dry Pond” on W portion of Poinsett Electronic Weapons Range, off E side of SC 261, 5 air mi SSE of Wedgefield, 33.8244 N, 80.4986 W, 5 October 2002, *Nelson 23436* (USCH!); N side of SC 763 and 1.58 miles E of SC 216 on E side of Wedgefield., 33.896199 N, 80.490969 W, 12 September 2015, *Nelson 34566* (USCH!); Manchester State Forest. South of Fullers Earth Creek. From the junction of Center Trail Road, once a passageway road, and Guardrail Road go north on Center Trail and take first left on unnamed dirt road. Site is 3 miles on left., 9 September 1999, *Pittman & Darr 9099910* (USCH!); 1 mi. west of Scottsville, near Black River., 4 October 1957, *Radford 29534* (NCU!); Union County: at Tyger River Bridge east of Cross Keys near Gist Mansion., 6 October 1957, *Bell 10584* (NCU!); Williamsburg County: edge of small pond on W side of US 52, about 3 mi SW of Heineman, 18 September 1986, *Nelson & Bennett 4971* (USCH!); York County: 0.4 mile west of junction Co. 11 and SC 5 on Co. 11 (west northwest of York)., 19 September 1957, *Ahles 34493* (NCU!); 1/4 mile north of the intersection of Highway 5 (Springdale Road), and Neptune Road. The large transmission line easement, 21 October 2008, *Chicone, Ronald E. s.n.* (USCH!); SC 322 just W of Turkey Creek; upland area 2.3 mi E of SC 97. Ca. 11 mi SSW of York., 19 September 1992, *Horn 6043* (USCH!); on NE side of Rolling Ridge Rd; S side of Rock Hill., 30 September 1986, *Nelson & Rayner 5018* (USCH!); NE of SC 901 on S side of Rock Hill, 15 October 1991, *Nelson & Soblo 11779* (CM!); Tennessee, Carter County: Along Nove [sic; Nave] branch above Winner, Iron

Mountain., 28 August 1946, *Sharp & Shanks 1927* (NCU!); Hawkins County: 6. mi n.e. of Rogersville., 31 August 1964, *Wolfe 18432* (NCU!); Jefferson County: Rest area on west-bound lane of I-40, 4.3 mi. W of Cocke County line., 7 August 1994, *Vincent & Lammers 6763* (MU!); Marion County: the Fiery Gizzard Gorges Roadside of logging road, ca. 0.5 miles of Anderson Point., 11 October 1965, *Clark & Radford 2200* (NCU!); Montgomery County: off Albright Road (SE Montgomery County) near Oak Plains., 12 September 1967, *Chester 1884* (NCU!); Morgan County: Road between Glades & Grimsley, 28 September 1966, *Rogers 40556* (NCU!); Polk County: Roadside of Cherokee Nat. Forest Rd. 27 north of Hiwassee River., 16 August 1970, *Somers & Bowers 45756* (NCU!); Stewart County: Land between the Lakes On Pant[h]er Creek 1/4 mile east of marker 8P5., 9 August 1966, *Wofford 2462* (NCU!); Texas, Bastrop County: N of Cabin 14, ca. 1.8 airmiles ENE of jct. St. Rt. 71 and St. Rt. 95 at Bastrop. Bastrop State Park. Bastrop Quadrangle, 30.001946 N, 97.00464972 W, 6 September 2012, *Carr 31656* (TEX-LL!); Freestone County: Fairfield Lake Recreational Area; 6 miles northeast of Fairfield; near the trailer dump station, 10 September 1994, *Do & Holmes 153* (MU!); Newton County: on W side of Big Cow Creek on U.S. Hwy 190, Newton, 30.85191 N, 93.79728 W, 23 September 2000, *Holmes & Singhurst 11017* (MU!); Travis County: Austin, Brackenridge Field Laboratory. Near Colorado River., 13 October 1985, *Rawlins 272* (CM!); Accomack County: east of bay-side dunes on south end of island. Assateague I., 7 September 1966, *Harvill 15106* (NCU!); Charles City County: near B&O-C&O RR tracks just west of the Co. Rt. 609 crossing southeast of Roxbury Corner., 13 September 1969, *Ware 2611* (NCU!); in powerline cut that intersects Herring Creek just NW of the Va. Rt. 5 bridge; P.O. Barnetts., 14 October 1971, *Ware 3850* (NCU!); Va. Rt. 5, just E of jct. Va. Rt. 155 in Charles City., 25 September 1975, *Ware, Ware & Glasscock 6501* (NCU!); Culpeper County: Rappahannock River on US. 211 (extreme n. part of Co.), 12 September 1965, *Ahles & James 61486* (NCU!); Dinwiddie County: just south of Darvills., 27 August 1965, *Harvill 17395* (NCU!); Halifax County: 3 miles south of Hyco River on US. 501 (s. of Cluster Springs), 3 September 1967, *Ahles & James 60503* (NCU!); Henrico County: west of Elko Station, 3 September 1967, *Harvill 17644* (NCU!); Isle of Wight County: Blackwater Ecologic Preserve; Off state rt. #614, 4.5 mls. s. of Zuni. Sunny, open, sandy area adjacent to logging road, near Blackwater River., 20 October 1984, *Deramus Bray #84-50* (NCU!); James City County: 0.2 mi. south from road, 0.2 mi. along Short Loop Road, Jamestown Island., 16 September 1969, *Loetterle & Hall 383* (NCU!); King George County: subtending the S side of Pepper Mill Creek, ca. 0.2 mi. E of VA Rt. 610 and 1 mi. SE of Ambar., 2 September 1991, *Strong & Kelloff 824* (USCH!); Loudoun County: 0.8 miles east of junction US. 15 & Co. Rt. 657 on Co. 657 (se. of Lucketts), 11 September 1965, *Ahles & James 61228* (NCU!); at jct. of U.S. 33 and rte. 613 e. of Trevilians, 20 August 1991, *Bradley & Cain 24689* (USCH!); 3 mi. west of Middleburg, 12 September 1954, *Fosberg 36166* (USCH!); Intersection of Rt. 662 and Rt. 663, near Waterford, VA., 2 October 1999, *Sewell 170* (MU!); at Rt. 28 and Dulles Access Hwy, Dulles Airport., 11 September 1987, *Strong 222* (USCH!); Mecklenburg County: Bottom of Meherrin river, west of Va. 632, 21 September 1967, *Seaman 6035* (NCU!); New Kent County: Moyseneck Farm, Lanexa, 6 September 1968, *Morrow s.n.* (NCU!); Northumberland County: Along Rt. 666 just east of Rt. 731, N.E. of Remo, 13 September 1981, *Norris & Bradley 270* (CM!); Patrick County: vicinity of Cedarfont near Stewart [sic; Stuart], 22 August 1965, *Ahles & Clark 60001* (NCU!); Pittsylvania County: Sandy Creek on Co. rt. 730 (ene. of Ringgold), 2 October 1965, *Ahles & James 62266* (NCU!); Mill on Burch Creek on Co. Rt. 710 (ne. of Kentuck), 2 October 1965, *Ahles & James 62318* (NCU!); 8 mi. w. of Gretna, along Pigg River, 8 October 1940, *Fosberg 17613* (NCSC!); Prince Edward County: 1.5 miles southwest of junction Co. Rt. 630 & 637 on Co. Rt. 630 (e. of Worsham), 16 October 1965, *Ahles & James 62793* (NCU!); Shenandoah County: east of Pughs Run N. of Woodstock; Massanutten Range, 18 September 1938, *Allard 5585* (CM!, NCSC!); West Virginia, Braxton County: Sugar Creek south of Gassaway, 5 September 1953, *Boggs s.n.* (CM!); Calhoun County: V. C. Brannon Farm, 5 September 1983, *Berdine 83 - 72* (NCSC!); Grant County: Smoke Hole, 12 August 1931, *Netting 145* (CM!); Smoke Hole, 12 August 1931, *Netting 211* (CM!); Smoke Hole Caverns, 3 September 1994, *Suiter & Ewing 174* (USCH!); Hampshire County: on north slope facing Potomac River at confluence of north and south branches., 19 September 1969, *Downs 8972* (NCU!); Wayne County: Co. Rt. 52-25 at BM 1138, ca. 2 mi. NW. of Dunlow; Radnor Quad, 25 September 1990, *Cusick 29277* (NCU!); Webster County: Right Fork of Little Kanawha River at Rt. 20 just ne. of Cleveland, n. Webster Co., 13 September 1962, *Rossbach 4135* (NCU!); Wirt County: about 1 1/2 mi. up Little Kanawha River from mouth of Reedy Creek, 9 September 1943, *Bartholomew s.n.* (CM!); Wirt County Hatchery, 7 September 1953, *Bartholomew s.n.* (NCU!); Wyoming County: about 3 miles from Bud, on the road to Sand Gap, 16 September 1973, *Lafferty 1302* (MU!, NCU!, USCH!).

Trichostema nesophilum:—U.S.A. North Carolina, Brunswick County: Battery Island, 28 October 1950, *Boyce & Godfrey 1586* (NCSC!); Zeke Island, seven miles south Carolina Beach, 2 September 1939, *Carl & Wells s.n.* (NCSC!); Smith Island, 27 July 1965, *Cooper 2888* (NCSC!); Bald Head Island. Frying Pan Way., 4 November 2004, *Franklin Buchanan & Suiter 562* (NCU!); at mouth of Lockwood Folly River, 25 May 1981, *Leonard 7507* (NCU!);

Bald Head Island State Natural Area, just inside northern border, 33.901058 N, 77.952036 W, 12 September 2017, *Schoonover, II 105* (NCU!); Bald Head Island State Natural Area, just inside southern border, 33.865956 N, 77.9591 W, 15 October 2017, *Schoonover, II 113* (NCU!); Ocean side of South Bald Head Wynd at Cladach Court, near southeast end of Bald Head Island, 33.849637 N, 77.975277 W, 2 October 2008, *Suiter & Kunz 2536* (NCU!); Smith's Island, 4 September 1939, *Wells s.n.* (DUKE!, NCSC!); Smith Island, 3 July 1940, *Wells s.n.* (NCSC!); Carteret County: Rachel Carson Reserve: Bird Shoal, 34.709961 N, 76.676113 W, 1 October 2017, *Schoonover, II 108* (NCU!); Shackleford Banks, 34.681936 N, 76.647013 W, 2 October 2017, *Schoonover, II 109* (NCU!); Core Banks, 34.611972 N, 76.527875 W, 3 October 2017, *Schoonover, II 110* (NCU!); Fort Macon State Park Nature Trail, 34.694731 N, 76.687358 W, 18 September 2017, *Schoonover, II 107* (NCU!); Dare County: Buxton, 6 October 1973, *Boufford 12215* (CM!); 4 mi. w. of Old Cape Hatteras Lighthouse, HATTERAS ISLAND, e. of Pamlico Sound, 14 October 1940, *Fosberg 17944* (NCSC!); Pea Island National Wildlife Refuge, southern end of park below New Inlet, 35.670752 N, 75.478767 W, 9 September 2018, *McClelland 178* (NCU!); Salvo, 35.534891 N, 75.468578 W, 8 October 2017, *Schoonover, II 112* (NCU!); Cape Hatteras National Seashore: Between Frisco and Hatteras village, west side of NC 12., 15 August 2012, *Sorrie 13073* (NCU!); Cape Hatteras National Seashore: South side of Hatteras village, entrance to 4WD road through dunes., 15 August 2012, *Sorrie 13074* (NCU!); Cape Hatteras National Seashore: south of Open Pond, 35.245556 N, 75.559167 W, 24 October 2012, *Sorrie 13126* (NCU!); Cape Hatteras National Seashore: South of Avon, east of NC 12, 26 October 2012, *Sorrie 13131* (NCU!); Hyde County: Ocracoke Island, 35.107780 N, 75.952418 W, 8 October 2017, *Schoonover, II 111* (NCU!); New Hanover County: Artificial sandy knoll called Battery Buchanan at end of US 421 past the Fort Fisher-Southport Ferry, Fort Fisher State Forest Historic and Recreation Area., 3 October 2020, *Basinger & Basinger s.n.* (NCU!); On north side of hillock near Federal Point, Fort Fisher State Park, North Carolina., 33.960115 N, 77.94139 W, 10 September 2016, *Schoonover, II, & McClelland 81* (NCU!); On north side of hillock near Federal Point, Fort Fisher State Park, North Carolina., 33.960115 N, 77.94139 W, 10 September 2016, *Schoonover, II, & McClelland 82* (NCU!); Edge of grilling area at Fort Fisher State Recreation Area., 33.964326 N, 77.922086 W, 10 September 2016, *Schoonover, II, & McClelland 83* (NCU!); Edge of grilling area at Fort Fisher State Recreation Area., 33.964326 N, 77.922086 W, 10 September 2016, *Schoonover, II, & McClelland 84* (NCU!); Pender County: Plants located on Topsail Island from 130 South Anderson on the NW side of the street, south to Barwick Avenue, as well as down Barwick Avenue on the SW side of the street., 34.373678 N, 77.618469 W, 5 October 2012, *Kunz & Suiter s.n.* (NCU!); South Carolina, Charleston County: Cape Romain NWR - Cape Island, 33.03966667 N, 79.34861667 W, 17 July 2009, *CVS* (NCU!); Cape Romain National Wildlife Refuge. Northern part of Cape Island, 33.079475 N, 79.333961 W, 10 September 2014, *Koches s.n.* (NCU!); Cape Romain National Wildlife Refuge. Cape Island, located on the northern, accreting end of the island, about 125 m east of Cape Romain Harbor, 130 m west of the ocean, 1 km south of island's northern tip, 33.078063 N, 79.33482 W, 19 September 2014, *Rankin s.n.* (NCU!, USCH!); Northern Cape Island, Cape Romain National Wildlife Refuge, 33.078175 N, 79.33411111 W, 16 October 2017, *Schoonover, II, & Tupacz 114* (NCU!); Georgetown County: Debordieu Beach, 33.35669524 N, 79.15283126 W, 17 July 2009, *CVS* (NCU!); about 2600' S of Coast Guard light; North Island, 27 September 1991, *Nelson 11579* (NCU!, USCH!); about 3000' NE of old Coast Guard light looking over beach; North Island, 27 September 1991, *Nelson 11584* (NCU!, USCH!); about 2600' S of old Coast Guard light; North Island, 27 September 1991, *Nelson 11591* (NCU!, USCH!); about 1/4mi N of parking lot at NE end of Huntington Beach State Park, E side of US 17, about 12 mi N of Georgetown, 33.5188 N, 79.0467 W, 27 September 2003, *Nelson 24295* (NCU!, USCH!); about 1.6 mi N of Coast Guard Station, on E side of North Island, 15 May 1990, *Nelson 8995* (USCH!); about 3000' SSE of old Coast Guard light, near the beach; North Island, 27 September 1991, *Nelson 11582* (USCH!); about 2600' S of old Coast Guard light, W side of North Island, 27 September 1991, *Nelson 11590* (USCH!); just NE of lower terminus of Goose Blind Rd; Pine Ridge on lower part of South Island., 17 February 1993, *Nelson & Cely 13774* (USCH!); Huntington Beach State Park. North of northern beach parking lot, 33.51766667 N, 79.04664167 W, 16 October 2017, *Schoonover, II 115* (NCU!).

Trichostema setaceum:—U.S.A. Alabama, Barbour County: above W.F. George Reservoir, ca. 5 mi. s. of Eufaula off Ala 95., 18 October 1969, *Kral 38022* (NCSC!); Lee County: Auburn, 11 October 1896, *Earle s.n.* (CM!); Auburn, November 1898, *Earle & Baker s.n.* (CM!); Auburn, Alabama, September 1900, *Lloyd & Earle s.n.* (CM!); Mobile County: Mobile, Ala, s.d., *Mohr s.n.* (CM!); Morgan County: Hartselle; by US 31, 6 October 1974, *Kral 54406* (NCSC!); Saint Clair County: Blount Cy [sic; county] Alabama; ad fluv. Coosa dit. Clair Cy., Alabama [sic; at the Coosa river in Clair County, Alabama], September 1843, *Rugel s.n.* (NCU!); Pottsville sandstone ridge, western end, 15 September 1962, *Bostick 223-10* (NCU!); District of Columbia: D.C., s.d., *Canby 255* (NCSC!); Florida, Alachua County: Gainesville, October 1947, *Blake s.n.* (FLAS!); Gainesville, February 1920, *Fattiq 8* (US!); Bay County: Lynn Haven, 13 October 1921, *Billington s.n.* (US!); near Lake, Rt. 22, east of Panama City, 9 October 1949, *Hood 3311*

(FLAS!); Rt. 79, N of West Bay, 11 October 1949, *Hood 3353* (GA!); Citrus County: Withlacoochee State Forest - Citrus, 28.738136 N, 82.41798611 W, 7 October 2018, *McClelland 189* (NCU!); Clay County: Gold Head Ravine State Park: E. side of SR 21, ca. 10 mi N. of Keystone Hts. East of the Mill Site, 15 September 1981, *White 152* (FLAS!); Columbia County: 2 miles north of Fort White, 3 October 1946, *West & Arnold s.n.* (FLAS!); Duval County: near Jacksonville, Fla., October, *Curtiss 1977* (FLAS!); near Jacksonville, Fla., 11 October 1894, *Curtiss 5277* (GA!, NCSC!, US!); near Jacksonville, Fla., 24 October 1893, *Curtiss 4397* (US!); Escambia County: near Paradise Beach, southwest of Pensacola, 28 September 1957, *Kral & Godfrey 6075* (NCU!); Franklin County: 2.5 mi W. Ochlockonee Riv. Road 110., 1 November 1941, *Kurz s.n.* (FLAS!); Gadsden County: 1 mi s of Wetumpka, 12 October 1966, *McDaniel 7865* (FLAS!); Hernando County: about 1 mile south from Nobleton on dirt road to Croom, 18 September 1981, *Correll & Correll 52522* (FTG!); Withlacoochee State Forest: Croom Tract, 28.590609 N, 82.264684 W, 16 October 2021, *McClelland & Schoonover 216* (NCU!); Holmes County: E of Bealia Rd and W of Sun Lake, ca. 0.6 mi N of County Line Rd and 0.7 mi W of FL 79, 1.0 air mi SW of jct FL 79 and I-10, ca. 3.7 air mi SW of Bonifay; Sun Lake Longleaf Savanna, 30.751389 N, 85.696389 W, 29 September 1992, *Orzell & Bridges 20829* (FLAS!, FTG!); Leon County: near old Tram Road, ca. 3 mi. SE Tallahassee, 7 October 1962, *Clewell 731* (NCU!, USF!); near Lake Bradford, 14 October 1956, *Godfrey & Jervis 55200* (GA!, NCSC!); Near Tallahassee, Florida, 9 October 1949, *Jackson s.n.* (FTG!); Leon County, Florida, 29 September 1942, *Kurz s.n.* (FLAS!); Lake Talquin State Park, 30.435564 N, 84.53125833 W, 13 July 2018, *McClelland & Schoonover 154* (NCU!); Liberty County: Collected from S side of St. rd. 12 at intersection of 12 and 271, 8 November 1987, *Alcorn 441* (FLAS!); at clearing above the Apalachicola River at Alum Bluff overview (ca. 2.0 mi N of Bristol), 30.46389 N, 84.98693 W, 12 November 2012, *Anderson 26804* (NCU!); Bordering park road, Torreya State Park, 30.568753 N, 84.946286 W, 19 October 2021, *Anderson-Messec & Anderson s.n.* (NCU!); Torreya State Park, June 1949, *Beck s.n.* (FLAS!); beside the shop at Orange, 22 October 1966, *D'Arcy 1277* (FLAS!); Torreya State Park, 30.568753 N, 84.94628611 W, 14 August 2018, *McClelland & McClelland 172* (NCU!); Torreya State Park, 30.568753 N, 84.94628611 W, 14 August 2018, *McClelland & McClelland 173* (NCU!); Marion County: Ocala National Forest Road 67, 1 mi. w. of junction with Fla. 314A, 7 mi. n.w. of Oklawaha, 4 November 1973, *Baltzell 5532* (GA!); S. of McIntosh, 13 October 1940, *Murrill s.n.* (FLAS!); Okaloosa County: small side road s. of no. 232, w. of Turkey Creek, 0.7 mi. w. of Fla. 85 ... ca. 4 mi. nw. of Niceville, 5 October 1966, *Chapman & Chapman 124* (FLAS!); Blackwater River State Forest, 30.812567 N, 86.76703611 W, 14 August 2018, *McClelland & McClelland 177* (NCU!); Orange County: At Clarcona, 25 October 1899, *Meislahn 93* (US!); Santa Rosa County: along No. 232, n. of Holley Creek ... ca. 12.5 mi. ssw of Holt, 6 October 1966, *Chapman & Chapman 139* (FLAS!); Walton County: 4 mi. S of Freeport; on our place, 2 October 1970, *Davis & Davis 15444* (CM!); Rt. 187, north of DeFuniak Springs, 23 September 1949, *Hood 2885* (FLAS!); on Grid (Area 52A); ca. 7 mi. w. of Portland, S11-12, T1S, R21W, 30.510646 N, 86.309207 W, 29 August 1967, *Smith 1880* (FLAS!); Sect. 5, T1S, R21W, from the forks of road 219-217, 2 October 1950, *Tyson 438* (GA!); Georgia, Bulloch County: Approx. eight miles south of Statesboro near lower Lott's Creek Church, 17 October 1959, *Boole, John A. 1002* (NCU!); Locality: 0.5 mi north of Lower Lott's Creek Church. Georgia Bulloch County +/-81degrees20' -- 82degrees00' W X 32degrees10' -- 32degrees40' N, 5 October 1964, *Hall 70* (NCU!); Elbert County: S of GA hwy 72 on county road #78. around hunting lodge., 6 September 1977, *Coile, Bruce, Jones & Kirkman 1372* (NCU!); Grady County: on the R. C. Balfour Property, 6 1/2 mi S of Whigham, Ga., 29 September 1963, *Faircloth 617* (NCU!); Harris County: FDR State Park water supply spring on S side of Pine Mt., 16 September 1971, *Jones, Parker, King, Faust & Braswell 21471* (NCU!); Hart County: Vegetational Survey of Richard B. Russell Dam and Lake Area, On southwest-facing slope along Cedar Creek; Site #50 (Lat. 34 degrees 18'12"; Long. 82degrees47'40"), ca. 0.75 mile west of the Savannah River; ca. 1.75 mile south of the Ga. 181 bridge over the Savannah River. Below the 475-ft. contour (full pool for proposed Russell Lake; completion date, mid-1980's), 34.303333 N, 82.794444 W, 3 September 1979, *Credle, Fairey, III, & Douglass 2320A* (NCU!); McIntosh County: n. of graveyard near power line on Wesley Lake Rd., 7 October 1962, *Bozeman & Radford 2203* (NCU!); Meriwether County: By Roosevelt Highway, south of Warm Springs, Georgia, 28 September 1946, *Totten s.n.* (NCU!); Richmond County: jct of US 78 and Barton Chapel Road, s. of Augusta, 30 September 1958, *Duke 2740* (NCU!); Screven County: Blue Springs in southeastern Screven County, 3 October 1940, *Eyles 7577* (NCSC!); Kentucky, Estill County: Estill Co. 1 mile southeast of Hargett., 9 September 1939, *Wharton 422* (NCU!); Louisiana, Winn County: north of USFS Road 506 and west of USFS 554 north of La. 126 at Pine Ridge west of Dodson in Kisatchie National Forest; Sec. 9, T13N, R5W., 32.124916 N, 92.884971 W, 5 October 1991, *Thomas 127002* (MU!); Maryland, Allegany County: @ 1 mile east of Oldtown on Rt. 51, 26 August 1968, *Downs 4763* (NCU!); Outdoor Club Barren, Green Ridge State Forest. E of Outdoor Club Road on slope crests above Potomac River S intersection of Merten Avenus ca. 0.7 miles, 13 September 2011, *Knapp & Thompson 3361* (TAWES!); Wicomico County: Salisbury, Maryland, September 1863, *Canby 1977* (NCU!); Mississippi, Forrest County: Ragland

Hills, 27 September 1969, *Rogers 1707* (NCU!); Perry County: Ragland Hills, 21 August 1970, *Rogers 4083* (NCU!); Missouri, Scott County: Hudson Property, on N side of County Road 504, W of junction with County Road 505, ca. 3.5 air miles SE of Benton. Near S end of property along old farm road running N parallel to sand woodland border, 37.0555556 N, 89.5155556 W, 28 August 2015, *Yatskiyevych, McKenzie, Gray, Henry, Turner, Atwood, Briggler, Holmberg & Schuhmann 15-115* (MO!); New Jersey, Camden County: Griffith's, White-Horse road [Now US 30; White Horse Pike], 4 mi. from Camden, 12 September 1869, *Parker s.n.* (CM!); Camden, N. J., 20 September 1868, *Porter s.n.* (CM!); North Carolina, Alexander County: Rocky Face Mt., n. of Hiddenite, 3 October 1948, *Fox & Godfrey 2058* (NCSC!); Little Joe Mountain, 36.014635 N, 81.149808 W, 6 September 2020, *McCormick & Peifer s.n.* (NCU!); Bladen County: Along southeast side of NC 11 at powerline crossing 1 mile north of Cape Fear River bridge, 13 September 1997, *LeBlond 4877* (NCU!); Cleveland County: Broad River about 4.5 miles south of Boiling Springs on N.C. 150, 18 September 1956, *Ahles & Leisner 19180* (NCU!); Cumberland County: 2.3 miles southwest of Hope Mills, 11 October 1957, *Ahles 36593* (NCU!); Franklin County: Outcrop located along the northern side of NC 56 1.6 km east of the NC 56-SR1467 intersection., 19 September 1992, *Ingle 1118* (NCSC!); 3.7 miles nne. of Rolesville, 6 September 1961, *Radford 44337* (NCU!); Gates County: Wyanoke, 8 October 1959, *Ahles & Horton 53071* (NCU!); Granville County: Outcrop located along the southern side of SR 1629, 1.6 km west of the SR 1629-SR 1625 intersection., 9 October 1992, *Ingle 2160* (NCSC!); Henderson County: Flat Rock, N.C., 18 August 1895, *Memminger s.n.* (NCU!); Hoke County: Location: Fort Bragg Military Reservation: Little River Bends, north of Manchester Road and east of Vass Road., 35.174482 N, 79.149373 W, 21 September 2008, *Sorrie 12264* (NCU!); Macon County: Franklin, North Carolina, off Country Walk, above the Little Tennessee River, 35.152546 N, 83.371835 W, 28 September 2021, *Papay s.n.* (NCU!); Madison County: 3.6 miles northwest of Hot Springs on north side of French Broad River, 8 October 1958, *Ahles & Duke 50650* (NCU!); Moore County: 3 mi. e of Carthage, 11 October 1959, *McNeely 1034* (NCU!); Weymouth Woods Sandhills Nature Preserve: Pine Barrens Trail., 35.151266 N, 79.369916 W, 22 September 2002, *Sorrie 11012* (NCU!); Orange County: Duke Forest, Korstian Section, Corner of "West Road" and "Unknown Road", 35.988056 N, 79.035556 W, 16 September 2017, *Peifer s.n.* (NCU!); Richmond County: 3.1 miles east of Ellerbe on Ellerbe-Hoffman Road., 25 July 1959, *Gupton 2129* (NCU!); Robeson County: Salt Marsh Bay; located about ½ mile N of the intersection of SR 1748 & 1749; plant on sand rim just S of the bay., 10 September 2008, *LeGrand, Harry E. s.n.* (NCU!); Wake County: Horse Creek, 4.5 mi. WSW of Wake Forest on Rt. 98, 22 September 1966, *Downs 129* (NCSC!); Mitchells Mill Outcrop; Outcrop located along the Little River just south of the NC 96 bridge between NC 96 and SR 2300, 2 August 1992, *Ingle 2408* (NCSC!); 2797 Lizard Lick Rd (SR 2329), N of SR 2320 (Riley Hill Rd), N of town of Wendell, W of town of Zebulon., 35.844681 N, 78.375115 W, 7 October 2020, *Joyner s.n.* (NCU!); 5720 Pulley Town Rd (SR 2300), Wake Forest... at Mitchell Mill State Natural Area, 35.917738 N, 78.391147 W, 7 October 2020, *Joyner s.n.* (NCU!); Mitchel Mill State Natural Area near Rolesville, NC., 35.915621 N, 78.389759 W, 2 October 2016, *Schoonover, II, & Amyx 86* (NCU!); Ohio, Pike County: NW Pike Co.; at gravel pit, W of Limerick, 22 August 1958, *Henry & Buker s.n.* (CM!); South Carolina: s.d., *Anonymous s.n.* (USCH!); Abbeville County: Parsons Mountain, 6.7 mi. south of Abbeville, 13 October 1957, *Radford 30834* (NCU!); Aiken County: 0.3 miles east of junction US. 1-76 and SC. 254 on US. 1-76 (between North Augusta and Aiken), 27 October 1961, *Ahles & Crutchfield 55092* (NCU!); next to path along railroad, Road A-2; Savannah River Site, 7 October 1987, *Angerman s.n.* (USCH!); at jct S-980 and S-153, just E of Shaws Creek; 5 mi N of Aiken, 2 October 1983, *Angerman s.n.* (USCH!); Station 13: Branch of Tinker Creek, a branch of Upper Three Runs Creek, 1 mile west of Kennedy's Lake, 1 October 1951, *Kelley s.n.* (USCH!); at dirt rd; S of Vacluse off SC 191, 9 October 1989, *Nelson, Allard, Boyle & McLemore 8549* (USCH!); Aiken SC, 19 September 1866, *Ravenell s.n.* (USCH!); Barnwell County: Barnwell State Park, 6 October 1956, *Porter 318* (USCH!); Beaufort County: 25m from Chipps Dr, on the Northwest quarter of Lady's Island, Northeast of the town of Beaufort., 5 October 1997, *Robertson & Medley 38* (USCH!); Calhoun County: junction Co. 157 and 72 (west of Lone Star), 27 September 1957, *Ahles 35340* (NCU!); Cherokee County: 0.5 mile west southwest of junction of US. 29 and County 52, then 2.6 miles northwest on dirt road, 18 September 1957, *Ahles 34300* (NCU!); Clarendon County: northeast of Santee River, ca. 0.5 mile south of U.S. 301., 16 September 1967, *Bozeman, Radford & Leonard 11451* (NCSC!, NCU!, USCH!); Edgefield County: near US. 25, 9.2 mi. sw. of Trenton, 12 October 1957, *Radford 30150* (NCU!); Greenville County: Below Caesars Head, 1 mile north of the junction of U.S. highway 276 and state highway 11., 13 September 1957, *Freeman 57803* (NCU!); Jasper County: on Tillman ridge, 7.4 miles northwest of Tillman on Co. Rt. 119., 24 September 1969, *Leonard & Radford 3027* (NCU!); Kershaw County: 8.1 mi. sw. of Camden on US 1, 14 August 1958, *Duke & Ahles 2156* (NCU!); 5.5 miles ene. Of Camden, 6 October 1957, *Radford 30126* (CM!); near Grannys [sic; Grannies] Quarter Creek, 5 miles wnw. of Shamokin, 6 October 1957, *Radford 30034* (NCU!); Lancaster County: about 2.5 miles north-northwest of Kershaw-Lancaster Co. line on SC. 97 and 1.3 miles east on dirt road (southwest corner of County), 20 September 1957, *Ahles 34806* (NCU!);

Lee County: 3.7 miles nw. of Bishopville, 3 October 1957, *Radford 29365* (NCU!); Lexington County: near US. 21, 5.5 mi. nne. of Gaston, 5 October 1957, *Radford 29817* (NCU!); Marion County: along Co. Rt. 49 ca. 15 mi. s. of Britton Neck., 20 October 1957, *Bell 11017* (NCU!); McCormick County: near Stevens Creek, 1.5 miles ne. of Clarks Hill, 13 October 1957, *Radford 30553* (NCU!); Oconee County: Chau-Ram County Park, Rte. 76, Westminister. Confluence of Chauga River and Ramsey Creek., 7 October 1987, *Hill 18944* (USCH!); near Chauga River; Chau Ram County Park, 5 September 2008, *Pittman, Boyle & Brown 5090806* (USCH!); Orangeburg County: 1.5 miles northwest of Eutawville on SC. 6, 26 September 1957, *Ahles 34965* (NCU!); Pickens County: Roadside, 5 miles northeast of Pickens, 22 September 1956, *Freeman 56761* (NCU!); Glassy Mt., 3 miles northeast of Pickens, 8 October 1957, *Freeman 57858* (NCU!); just below the summit of Cedar Rock Mountain, southeast aspect., 12 September 2004, *McMillan 8483* (USCH!); S-facing slope of Langley Mt. near summit, about 1.3 mi E of SC 8 on N side of SC 186, 5 October 1989, *Nelson & Ferral 8517* (NCU!); N side of SC 183 at Cedar Rock Mt, E of Pickens., 5 October 1989, *Nelson & Ferral 8529* (NCU!); N face of Glassy Mt off S-207, NE of Pickens, 5 September 1989, *Nelson, Lucas & Durant 8373* (USCH!); Richland County: Fort Jackson Army Installation: near roadside in vic of deerstand 31E, near terminus of Firebreak 26 at 'Back Line Leesburg Rd', Training Area 31, 21 September 1990, *Nelson 9745* (USCH!); Columbia, Richland Co., S.C., 5 October 1935, *Philson s.n.* (USCH!); Columbia, Richland Co., S.C., 8 August 1936, *Philson s.n.* (USCH!); Spartanburg County: S-92 about 1 mi S of its jet with SC 215, S of Glen[n] Springs, 13 September 1989, *Nelson & Neary 8447* (NCU!); Tennessee, Roane County: Walden's Ridge, above Rockwoods, just below fire tower, 25 September 1986, *Rogers s.n.* (NCU!); West Virginia, Hampshire County: Hanging Rock, 16 August 1942, *Frye 5392* (CM!);

Trichostema suffrutescens:—U.S.A. Florida, Clay County: near Deer Lake, Gold Head Branch State Park, 19 September 1961, *Laessle s.n.* (FLAS!, NCU!); Mike Roess Gold Head Branch State Park, 29.844153 N, 81.94750278 W, 9 October 2018, *McClelland 196* (NCU!); Lake County: Eustis, Florida, 8 September 1900, *Anonymous s.n.* (US!); between Tavares and Mt. Dora, 29 September 1943, *Rhoads s.n.* (FLAS!); e. of Alexander Springs, T16S R27E, 15 February 1964, *Ward 3852* (FLAS!, USF!); Marion County: N side SR 316, approximately 3.5 miles W FSR 88., 24 September 1985, *Christman & Hancock 34* (FLAS!); in Ocala National Forest along Rte. 19, about 1/2 mile north of Rte. 40., 7 October 1981, *Correll, Correll & Godfrey 52869* (FTG!, NCU!, USF!); Juniper Springs, Ocala Nat'l Forest, 23 September 1949, *Mather M-475* (GA!, USF!); Ocala National Forest, 29.212008 N, 81.76745 W, 8 October 2018, *McClelland 195* (NCU!); Ocala National Forest, 29.212008 N, 81.76745 W, 15 October 2021, *McClelland & Schoonover 210* (NCU!); near intersection of dirt roads, 4.8 mi. s. of Central Tower, along Fla. 40, Ocala National Forest, S7-18, T16S, R26E, 12 August 1961, *Smith & Myint 717* (FLAS!); 4 mi. S. of Lake Kerr P.O., 24 September 1941, *West & Arnold s.n.* (FLAS!); Orange County: Frontage Road Scrub (Oran02) Sec. 27, T24S, R28E (Windermere Quad), 28.370316 N, 81.500971 W, 24 September 1987, *Christman & Stout 1900* (FLAS!); Roadside opposite Turkey Lake Park., 14 October 1983, *Hopkins 1931* (FTU!); Northwest corner of Turkey Lake Park., 25 October 1983, *Hopkins 1947* (FTU!); Putnam County: Etoniah Creek State Forest. Sand road, ca. 250 m east of Holloway Road, 29.75562 N, 81.84398 W, 29 September 2018, *Whitten 6174* (NCU!); Seminole County: Altamonte Springs, Fla., s.d., *Beardslee s.n.* (MU!).

Acknowledgements

We would like to thank Bob Peet, Paul Manos, Paul Gabrielson, and Todd Vision for providing insightful feedback on initial drafts of this manuscript; Edwin Bridges and Steve Orzell for their integral assistance in both field work and accessing properties; Brandon Fuller and Andrea Perreault for access to computational resources; Carol Ann McCormick (NCU) for her assistance in obtaining herbarium loans; Herbaria ARIZ, CHSC, CM, DUKE, FLAS, FTG, FTU, GA, MO, MU, NCSC, RSA, TAWES, TEX-LL, US, USCH, USF, and WILLI for loaning specimens; Jimmy Garzoni, Shanna Oberreiter, and Greg Sollom for assisting in the care of greenhouse plants; Linda Duever (Mockernut Hill Botanical Garden), Lindsay Addison (Audubon NC), Ed Tupacz (FWS), Jenny Evans and Victor Young (SCCF), and many other park staff from various public and private local, county, state, and federal organizations, for their assistance in accessing properties during my field work; Laura Robinson (NCDNR), Chris Liloia (NCBG), Julie Tuttle, Herb Amyx, and the many members of the Flora Florida and Ecosystematics Facebook page and iNaturalist for helping locate populations of *Trichostema*; Mike Papay and Nancy Hamlett for providing specimens for genetic analysis; and Archbold Archbold Biological Station, Avon Park Air Force Range, Mockernut Hill Botanical Garden, North Carolina Botanical Garden, Collier County (Florida) Parks and Recreation, Lee County (Florida) Parks and Recreation, Pinellas

County (Florida) Parks and Recreation, Sanibel (Florida) City Parks, Sanibel-Captiva Conservation Foundation, Florida State Parks, Florida State Forests, North Carolina Audubon Society, North Carolina Coastal Reserve System, North Carolina State Parks, South Carolina State Parks, The National Park Service (Canaveral National Seashore, Cape Hatteras National Seashore, Cape Lookout National Seashore, Cumberland Island National Seashore, Fort Matanzas National Monument, Gulf Islands National Seashore, Timucuan Ecological and Historic Preserve, Wright Brothers National Memorial), and the Fish and Wildlife Service (Cape Romain National Wildlife Refuge, Hobe Sound National Wildlife Refuge, Merritt Island National Wildlife Refuge, Pea Island National Wildlife Refuge) for providing access to park property to conduct our field research.

References

- Bentham, G. (1830) *Dicerandra*. In: Lindley, J. (Ed.) *Edward's Botanical Register*. Vol. 15. Ridgeway, London, sub plate 1300, post number 108.
- Bentham, G. (1835) *Labiatarum genera et species*. Fasc. 7. Ridgeway & Sons, London, pp. 645–783.
- Bouckaert, R. & Drummond, A. (2017) bModelTest: Bayesian phylogenetic site model averaging and model comparison. *BMC Evolutionary Biology* 17: 42.
<https://doi.org/10.1186/s12862-017-0890-6>
- Bouckaert, R., Vaughan, T.G., Barido-Sottani, J., Duchêne, S., Fourment, M., Gavryushkina, A., Heled, J., Jones, G., Kühnert, D., De Maio, N., Matschiner, M., Mendes, F.K., Müller, N.F., Ogilvie, H.A., du Plessis, L., Poppinga, A., Rambaut, A., Rasmussen, D., Siveroni, I., Suchard, M.A., Wu, C.H., Xie, D., Zhang, C., Stadler, T. & Drummond, A.J. (2019) BEAST 2.5: an advanced software platform for Bayesian evolutionary analysis. *PLoS Computational Biology* 15 (4): e1006650.
<https://doi.org/10.1371/journal.pcbi.1006650>
- Casella, F., Vurro, M., Valerio, F., Perrino, E.V., Mezzapesa, G.N. & Boari, A. (2023) Phytotoxic Effects of Essential Oils from Six Lamiaceae Species. *Agronomy* 13: 257.
<https://doi.org/10.3390/agronomy13010257>
- Christman, S.P. & Judd, W.S. (1990) Notes on plants endemic to Florida Scrub. *Florida Scientist* 53 (1): 52–73.
- de Quieroz, K. (1998) The general lineage concept of species, species criteria, and the process of speciation: a conceptual unification and terminological recommendations. In: Howard, D.J. & Berlocher, S.H. (Eds.) *Endless Forms: Species and Speciation*. Oxford University Press, Oxford, pp. 57–75.
- Deyrup, M. (1989) Arthropods endemic to the Florida scrub. *Florida Scientist* 52 (4): 254–270.
- Dinno, A. (2017) *dunn.test: Dunn's Test of Multiple Comparisons Using Rank Sums* (1.3.5) [Computer software].
- Edwards, C.E., Soltis, D.E. & Soltis, P.S. (2006) Molecular phylogeny of *Conradina* and other scrub mints (Lamiaceae) from the southeastern USA: evidence for hybridization in Pleistocene refugia? *Systematic Botany* 31 (1): 193–207.
<https://doi.org/10.1600/036364406775971688>
- Florida Natural Areas Inventory (2010) *Guide to the Natural Communities of Florida*. Florida Natural Areas Inventory, Institute of Science and Public Affairs, Florida State University, Tallahassee, Florida. Available from: <https://www.fnai.org/species-communities/natcom-guide> (accessed 9 November 2022).
- Gray, A. (1870) Appendix: December, 1870. *Proceedings of the American Academy of Arts and Sciences* 8: 294–296.
- Huang, M., Crawford, D.J., Freudenstein, J.V. & Cantino, P.D. (2008) Systematics of *Trichostema* (Lamiaceae): evidence from ITS, *ndhF*, and morphology. *Systematic Botany* 33 (2): 437–446.
<https://doi.org/10.1600/036364408784571554>
- Huck, R.B., Judd, W.S., Whitten, M., Skean, J.D., Wunderlin, R.P. & Delaney, K.R. (1989) A new *Dicerandra* (Labiatae) from the Lake Wales Ridge of Florida, with a cladistic analysis and discussion of endemism. *Systematic Botany* 14 (2): 197–213.
<https://doi.org/10.2307/2418906>
- Kassambara, A. & Mundt, F. (2020) *factoextra: Extract and Visualize the Results of Multivariate Data Analyses* (1.0.7) [Computer software].
- Kearney, T.H. (1894) Some new Florida plants. *Bulletin of the Torrey Botanical Club* 21 (11): 482–487.
<https://doi.org/10.2307/2478323>
- Lewis, H. (1945) A revision of the genus *Trichostema*. *Brittonia* 5 (3): 276–303.
<https://doi.org/10.2307/2804884>
- Lewis, H. (1960) Chromosome numbers and phylogeny in *Trichostema*. *Brittonia* 12 (2): 93–97.
<https://doi.org/10.2307/2805208>

- Linnaeus, C. (1753) *Species Plantarum*. Vol. 2. Salvius, Stockholm, 640 pp.
- McClelland, R.K.S. & Weakley, A.S. (2019) A new species of *Trichostema* (Lamiaceae, Ajugoideae) from barrier island systems of North and South Carolina. In: Weakley, A.S., McClelland, R.K.S., LeBlond, R.J., Bradley, K.A., Matthews, J.F., Anderson, C., Franck, A.R. & Lange, J. Studies in the Vascular Flora of the Southeastern United States: V. *Journal of the Botanical Research Institute of Texas* 13 (1): 108–117.
<https://doi.org/10.17348/jbrit.v13.i1.832>
- McClelland, R.K.S. (2022) *Studies in the genus Trichostema Gronov.* [Doctoral Dissertation] University of North Carolina, Chapel Hill, 356 pp.
- McCormick, K.D., Deyrup, M.A., Menges, E.S., Wallace, S.R., Meinwald, J. & Eisner, T. (1993) Relevance of chemistry to conservation of isolated populations: the case of volatile leaf components of *Dicerandra* mints. *Proceedings of the National Academy of Sciences of the United States of America, Washington, DC* 90 (16): 7701–7705.
<https://doi.org/10.1073/pnas.90.16.7701>
- Michaux, A. (1803) *Flora Boreali-Americana*. Vol. 2. Levrault Brothers, Paris, 341 pp.
- Microsoft (2016) *Microsoft Excel* (16.0.15128.20178) [Computer software].
- NatureServe (2020) *NatureServe Conservation Status Assessments: Rank Calculator* (3.2) [Computer software].
- Noss, R.F., Platt, W.J., Sorrie, B.A., Weakley, A.S., Means, D.B., Costanza, J. & Peet, R.K. (2015) How global biodiversity hotspots may go unrecognized: lessons from the North American Coastal Plain. *Diversity and Distributions* 21 (2): 236–244.
<https://doi.org/10.1111/ddi.12278>
- Oliviera, L.O., Huck, R.B., Gitzendanner, M.A., Judd, W.S., Soltis, D.E. & Soltis, P.S. (2007) Molecular phylogeny, biogeography, and systematics of *Dicerandra* (Lamiaceae), a genus endemic to the southeastern United States. *American Journal of Botany* 94 (6): 1017–1027.
<https://doi.org/10.3732/ajb.94.6.1017>
- Ozkan, K. and Suel, H. (2008) Endemic plant species in a karstic canyon [Mediterranean Region, Turkey]: relation to relief and vegetation diversity. *Polish Journal of Ecology* 4 (56): 709–715.
- Perrino, E.V., Signorile, G. & Marvulli, M. (2013) A first checklist of the vascular flora of the Polignano a Mare coast (Apulia, southern Italy). *Natura Croatica* 22 (2): 295–318.
- Perrino, E.V., Tomaselli, V., Wagensommer, R.P., Silletti, G.N., Esposito, A. & Stinca, A. (2022) *Ophioglossum lusitanicum* L.: New Records of Plant Community and 92/43/EEC Habitat in Italy. *Agronomy* 12: 3188.
<https://doi.org/10.3390/agronomy12123188>
- Poindexter, D.B. (2019) *Comprehensive systematic approaches to understanding species diversity: a case study utilizing a non-model group of sedges, Carex sect. Acrocystis (Cyperaceae)* [Doctoral dissertation]. University of North Carolina, Chapel Hill, 346 pp.
- Rambaut, A. (2016) *FigTree* (1.4.3) [Computer software].
- RStudio Team (2022) *RStudio: Integrated Development Environment for R* (2022.02.3) [Computer software].
- Russello, M.A., Waterhouse, M.D., Etter, P.D. & Johnson, E.A. (2015) From promise to practice: pairing non-invasive sampling with genomics in conservation. *PeerJ* 3: e1106.
<https://doi.org/10.7717/peerj.1106>
- R Core Team (2021) *R: A language and environment for statistical computing*. (4.1.2) [Computer software].
- Schuster, T.M., Reveal, J.L. & Kron, K.A. (2011) Phylogeny of Polygoneae (Polygonaceae: Polygonoideae). *Taxon* 60 (6): 1653–1666.
<https://doi.org/10.1002/tax.606010>
- Soltis, D.E., Morris, A.B., McLachlan, J.S., Manos, P.S. & Soltis, P.S. (2006) Comparative phylogeography of unglaciated eastern North America. *Molecular Ecology* 15 (14): 4261–4293.
<https://doi.org/10.1111/j.1365-294X.2006.03061.x>
- Sorrie, B.A. & Weakley, A.S. (2001) Coastal plain vascular plant endemics: phytogeographic patterns. *Castanea* 66 (2): 50–82.
- Turland, N.J., Wiersema, J.H., Barrie, F.R., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Kusber, W.H., Li, D.Z., Marhold, K., May, T.W., McNeill, J., Monro, A.M., Prado, J., Price, M.J. & Smith, G.F. (2018) *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017*. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten.
<https://doi.org/10.12705/Code.2018>
- Weakley, A.S. (2005) *Flora of the Carolinas, Virginia, and Georgia: Working Draft of June 10, 2005*. North Carolina Botanical Garden, Chapel Hill, North Carolina. Available from <https://ncbg.unc.edu/research/unc-herbarium/floras/> (accessed 9 November 2022).
- Weakley, A.S., Lee, M., Ward, S., Ludwig, J.C., Sorrie, B., Poindexter, D., LeBlond, R., Kees, J., McCormick, C.A., Oberreiter, S., Ungberg, E., Lance, R., Ballard, H., Carter, R., Pyne, M., Knapp, W., Bradley, K., Zona, S., Barger, W., Musselman, L., Schafran, P., Spaulding, D., Nelson, J., Keith, E., Fleming, G., Estes, D., Majure, L., Medford, H., Bridges, E., Folk, R., Murrell, Z., Peet, R., Townsend, J., Nesom, G., Floden, A., Horn, J., Schilling, E., Triplett, J., Murphy, T., Irick, Z., McClelland, R.K.S., Alford, M., Brock,

- M., *et al.* (2023) *Flora of the Southeastern United States*, 2023 ed. North Carolina Botanical Garden, Chapel Hill, North Carolina. Available from: <https://fsus.ncbg.unc.edu/index.php> (accessed 29 June 2023).
- Wheeler, R.J. & Pepe, J. (2002) The Jobé and Jeaga of the Palm Beach County area. *The Florida Anthropologist* 55 (3–4): 221–241.
- Wickham, H. (2016) *ggplot2: Elegant Graphics for Data Analysis* (3.3.5) [Computer software].
<https://doi.org/10.1007/978-3-319-24277-4>
- Wulff, A.S., Hollingsworth, P.M., Ahrends, A., Jaffré, T., Veillon, J.M., L’Huillier, L. & Fogliani, B. (2013) Conservation priorities in a biodiversity hotspot: analysis of narrow endemic plant species in New Caledonia. *PLoS one* 8 (9): e73371.
<https://doi.org/10.1371/journal.pone.0073371>