Magnolia fraseri, William Gardner Hembree (1993 - 2023)

SOUTHEASTERN PLANTS

REGIONAL SPECIES OF GREATEST CONSERVATION NEED

September 2023

Prepared by:

SE PCA — SE PLANT CONSERVATION ALLIANCE

ATLANTA BOTANICAL GARDEN

NATURESERVE

TCI — Nature Conservation and Communication

SEAFWA — Southeastern Association of Fish and Wildlife Agencies

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Land Acknowledgement

The Southeastern Plant Conservation Alliance (SE PCA) humbly acknowledges the Indigenous Peoples and Tribal Nations of our focal area. We are working on the homeland of many Tribes and Indigenous Communities, and it is with gratitude and appreciation that we seek to conserve species and natural systems that were nurtured by those stewards possessing unparalleled relationships with these lands since time immemorial. The SE PCA recognizes the many impacts of colonialism and the irreparable losses that have been endured by the original inhabitants – including humans, animals, plants, and stones - and the land itself. We aim to provide access to resources and opportunities for an informed alliance while we participate in building bridges, expanding perceptions, honoring Indigenous Knowledge, and weaving together our respective approaches.

To learn more about Tribes in the Southeast, you can visit the Southeast Climate Adaptation Science Center (SECASC) Tribal Story Map and the Native Land Digital interactive maps online. *These are ongoing works in progress that are not meant to represent official or legal tribal boundaries; to learn about definitive areas, please contact the nation(s) in question.*

Dalea cahaba (Alan Cressler)

Dedication

This report is dedicated to Dr. Jon Ambrose, who has worked for many decades to promote the conservation of plants and other wildlife at the state, regional, and national levels.

Jon joined the Georgia Department of Natural Resources in 1986 as a community ecologist, was promoted to manager of the Georgia Natural Heritage Program in 1998, and coordinated a broad spectrum of activities including field surveys, database development, outreach, administration of ecological assessment and conservation planning projects, as well as review of environmental projects, legislation, and policies. In 2004 he was promoted to Assistant Chief of Nongame Conservation, then became Chief of Wildlife Conservation in 2014. In these positions, Jon led the development and revision of Georgia's State Wildlife Action Plan, became influential in the Association of Fish and Wildlife Agencies (AFWA) and its Southeast chapter (SEAFWA), played an instrumental role in the development of the Southeast Conservation Adaptation Strategy (SECAS), and co-authored "The Natural Communities of Georgia". He retired in 2023 but remains a dedicated advocate for conservation.

Jon Ambrose played an intergal role in the development of the Regional Species of Greatest Conservation Need (RSGCN) for Animals of the Southeast, which has facilitated the prioritization of conservation projects and collaboration among states within the region. As the chair of the State Wildlife Action Plan implementation subcommittee for SEAFWA, he has been a leader in addressing cross-jurisdictional conservation issues, including the impacts of global climate change on wildlife populations in the Southeast. Jon humbly served as a project planning team member and advisor for this effort, and without his encouragement of and participation in the development of the Southeastern Plant Conservation Alliance (SE PCA), the Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) would not have come to fruition.

Jon, you have instilled confidence, enthusiasm, kindness, and knowledge in your colleagues and many emerging professionals. May we carry on your efforts in the conservation of all life forms and natural communities. We thank you for this lasting legacy.

Chamaelirium luteum (Alan Cressler)

Executive Summary

Background

The Southeastern Plant Conservation Alliance (SE PCA) in collaboration with Atlanta Botanical Garden, NatureServe, and Terwilliger Consulting Inc. (TCI), was granted funding for the development of a Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) list from the U.S. Fish and Wildlife Service in September 2021. The Southeastern region was defined by those states and territories included within the Southeastern Association of Fish and Wildlife Agencies (SEAFWA) region. The SE Plants RSGCN aims to create a complete picture of Southeastern wildlife and biodiversity in combination with the 2019 Southeastern Animals RSGCN published by SEAFWA (Rice et al. 2019).

Regional Species of Greatest Conservation Need

In consideration of the taxa to be included in the RSGCN, NatureServe compiled a list of 10,437 vascular plant taxa contained within the states of the SEAFWA Region and based on G-Ranks, S-Ranks, and regional endemicity assigned as a level of conservation concern. This was referred to as the pre-screened taxa list. Due to significant data limitations, plant taxa from the territories of Puerto Rico and the United States Virgin Islands could not be included.

The full list of 10,437 taxa was distributed along with a survey to experts in the Southeastern United States (referred to as the Survey Team) to request feedback, comments, and updates on current G- and S-Ranks, taxonomy updates, pre-screened Levels of Conservation Concern (LoCC), threats to the taxa, and conservation needs. Feedback from the Survey Team informed decisions made by the Technical Team (made up of one representative from each state organization in the Southeast) to manually review and update the LoCC if >50% consensus was not reached by the Survey Team. After Technical Team review, NatureServe evaluated taxa with synonymous taxonomy and removed 1,166 taxa from the RSGCN list. The resulting complete Southeastern taxa list was 9,271 taxa, with 1,824 RSGCN taxa.

Efforts to supplement the RSGCN list included an in-person Ranking Workshop in October 2022, an ecological systems crosswalk spearheaded by Alan Weakley, author of *Flora of the Southeastern U.S.*, and a compilation of climate tools and vulnerability assessment notes. The Survey Team identified 455 taxa as needing Global Rank review with 101 proposed as highest priority. During the Ranking Workshop, participants completed Global Rank reviews for 71 high priority taxa. The RSGCN list was finalized after receiving the completed ecological systems crosswalk from Alan Weakley and the Flora of the Southeastern United States (FSUS) team. The corresponding Group and Alliance levels of the United States National Vegetation Classification (USNVC), in addition to climate projections for ecological Groups for all RSGCN taxa and Alliances for some, will serve to produce a finer-scale representation of ecosystems than are referenced by the Macrogroups in the animal RSGCN lists. The addition of these tools will promote more holistic conservation and set the stage for more inclusive, comprehensive and effective landscape conservation of priority taxa, primarily via the inclusion of Conservation Opportunity Areas in State Wildlife Action Plans (SWAPs)."

RSGCN Prominent Habitats

We have categorized the primary habitats for the 1,824 RSGCN plant taxa by assigning each species to one or more Groups in the United States National Vegetation Classification (USNVC). This system of classifying vegetation types and habitats has been used for mapping on all National Park Service units in the United States and is now being incorporated into other important federal mapping efforts, including the LANDFIRE spatial product. The distribution of RSGCN taxa across Southeastern U.S. ecosystems demonstrates the vast ecological diversity of RSGCN taxa across the geographic extent of the region. A total of 31 USNVC Groups had at least 10 species, indicating that much of the ecological diversity of the region supports substantial biodiversity of conservation need. Many of these same habitats tend to provide critical habitat for RSGCN animal species, and thus the conservation of these ecosystems and their plant diversity supports conservation of much of the regional biodiversity.

Limiting Factors

As with any large-scale list, certain limitations cannot be avoided. One of the most impactful limitations of this RSGCN list is the inability of many states to include G4 and/or G5 taxa in their SWAPs. However, best practices, as outlined by the Association of Fish and Wildlife Agencies (AFWA's Teaming With Wildlife Committee 2012), recommend "prioritiz[ing] top tier taxa/species based on immediacy and magnitude of threats." Although many states may be limited by G-Ranks, the RSGCN will provide additional documentation of the level of conservation concern for certain taxa that otherwise may not be captured by G-Rank alone.

Conclusions and Recommendations

Collaboration with all parties and organizations involved in the first Southeastern plants RSGCN illustrated the breadth of potential for the RSGCN. Feedback from the Survey, Technical, and Ranking Teams combined with the expertise brought to the Project Planning Team by NatureServe, the Atlanta Botanical Garden, Terwilliger Consulting, Inc., and SEAFWA ensured an exceptional level of insight for each taxa under consideration. With over 10,000 taxa evaluated and 1,824 taxa in the final list, the RSGCN list can be utilized in 2025 (and future) SWAPs, as well as project proposals and funding requests, with the goal of impro ing recovery outcomes, enhancing conservation efforts, and documenting long-term changes.

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Acronyms

ABG - Atlanta Botanical Garden
AFWA - Association of Fish and Wildlife Agencies
BGCI - Botanic Gardens Conservation International
BGCI-US - Botanic Gardens Conservation International, U.S.
CASC - Climate Adaptation Science Center
COA - Conservation Opportunity Area
ESA - Endangered Species Act
FSUS - Flora of the Southeastern United States
GA DNR - Georgia Department of Natural Resources
IUCN - International Union on the Conservation of Nature
LoCC - Level of Conservation Concern
MAFWA - Midwest Association of Fish and Wildlife Agencies
NAFWS - Native American Fish and Wildlife Society
NEAFWA - Northeast Association of Fish and Wildlife Agencies
NEFWDTC - Northeast Fish and Wildlife Diversity Technical Committee
ORISE - Oak Ridge Institute for Science and Education
RAWA - Recovering America's Wildlife Act
RSGCN - Regional Species of Greatest Conservation Need
SE CASC - Southeast Climate Adaptation Science Center
SE PCA - Southeastern Plant Conservation Alliance
SE Plants RSGCN - Southeastern Plants Regional Species of Greatest Conservation Need
SEAFWA - Southeastern Association of Fish and Wildlife Agencies
SePPCON - Southeastern Partners in Plant Conservation
SGCN - Species of Greatest Conservation Need
SRP - Sustainable Rivers Program
SSA - Species Status Assessment
SWAP - State Wildlife Action Plan
TCI - Terwilliger Consulting, Inc.
TEK - Traditional Ecological Knowledge
TNC - The Nature Conservancy
TNTCX - United States Army Corps of Engineers Tribal Nations Technical Center of Expertise
UPS - United Plant Savers
USACE - United States Army Corps of Engineers
USDA, NRCS - United States Department of Agriculture Natural Resources Conservation Service
USET - United South and Eastern Tribes
USFWS - United States Fish and Wildlife Service
USGS - United States Geological Survey
USNVC - United States National Vegetation Classification
WDC - Wildlife Diversity Committee

Sarracenia jonesii (Carrie Radcliffe)

Foreword

Written by Terwilliger Consulting, Inc.

Background

The concept of Regional Species of Greatest Conservation Need (RSGCN) originated in the Northeast as the 14 Northeast Fish and Wildlife Agencies of the Northeast Association of Fish and Wild life Agencies' (NEAFWA) Wildlife Diversity Programs collaborated for a broader level landscape and watershed scale conservation approach in the 1990s. The purpose was to identify and conserve species of greatest conservation concern with ranges centered in the region for regional stewardship responsibility. The Northeast RSGCN list was updated for the 4th revision in 2023 (TCI and NEFWDTC 2023) as a charge of the NEAFWA Northeast Fish and Wildlife Diversity Technical Committee (NEFWDTC). Each revision has included more invertebrate taxa as additional data and expertise allow thorough analysis and selection.

The 15 states of the Southeastern Association of Fish and Wildlife Agencies (SEAFWA) followed suit in 2018 as their Wildlife Diversity Committee developed a list of almost a thousand animal species of greatest conservation need for the region (RSGCN). At that time, only a few invertebrate taxa were included (Rice et al. 2019). In 2021 the 13 states of the Midwest Landscape Initiative and Midwest Association of Fish and Wildlife Agencies (MAFWA) identified their region's first list of RSGCN that includes 13 animal taxonomic groups (Terwilliger et al. 2021).

At the same time, 9 states revised their original 2005 State Wildlife Action Plans (SWAPs) and included plants as Species of Greatest Conservation Need (SGCN). There was growing interest to include plants as SGCN and RSGCN even though they were not covered by the State Wildlife Grants purview for funding. The Georgia Department of Natural Resources (GA DNR) led the effort to include plants as SGCN and RSGCN along with strong support from the key organizations sponsoring this project. This support, along with the hope of Recovering America's Wildlife Act (RAWA) passage to include funding for plant SGCN, enabled this first landmark effort to advance regional plant conservation in the Southeast and facilitated this list of RSGCN plants effort to serve as a critical resource for states as they revise their SWAPs for 2025 and include plants as SGCN.

The inclusion of plants in the Southeast reflected significant support and partnership between key government and non-governmental organizations to manifest this important development. The foresight and leadership of Jon Ambrose and GA DNR as a champion of the SEAFWA Wildlife Diversity Committee (WDC), led the promotion of the effort regionally and nationally. The expertise and advocacy of the Atlanta Botanical Garden (ABG), the Southeastern Plant Conservation Alliance (SE PCA), and other key partners provided the impetus to initiate this RSGCN plant list and process. The Southeastern Partners in Plant Conservation (SePPCon) events in 2016 and 2020 were pivotal in strategic planning for SE PCA and the Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) as one of its primary goals. Then, to develop and provide the most useful and consistent outcome, Terwilliger Consulting Inc.'s (TCI) RSGCN experience coupled with NatureServe data and expertise provided the mechanism and method to manifest the inclusion of plants in the RSGCN effort.

A key outcome of this effort is the association of RSGCN to southeast habitats. This represents a milestone that will not only advance SWAP revisions, but also the next iteration of Southeast RSGCN to facilitate habitat associations for both plants and animals for more effective landscape conservation in the Southeast. We applaud and are grateful to all project partners and SEAFWA's WDC for their hard work and leadership in advancing plant conservation and RSGCN efforts regionally and nationally.

RSGCN Methods Comparison Summary

Since RSGCN were first identified in the Northeast for animals in 1999, and as three regions have now developed RSGCN animal lists, the basic methodology has remained consistent with minor advancements as new data and analysis tools have become available. Originally the list of eligible taxa for RSGCN identification was the list of SGCN from the collective SWAPs of the region. Regional SGCNs represent the taxa in need of collaborative conservation at the region level. As techniques and tools have advanced, this Southeast RSGCN plants list and the 2023 Northeast RSGCN animals list (TCI and NEFWDTC 2023) update were able to pre-screen all taxa known to occur in the region within the selected taxonomic groups, identifying taxa not yet designated as SGCN by any state in the region for consideration by the states in upcoming SWAP revisions. This facilitated proactive conservation with their conservation partners by providing a more inclusive, tiered list of taxa. This inclusive approach allows for taxonomic groups including plants or invertebrates to be comprehensively evaluated although all states within the region may not yet have included those taxonomic groups as SGCN in their SWAPs.

The two primary selection criteria to identify RSGCN remain regional responsibility and conservation concern status. Regional responsibility is the proportion of a taxon's geographic range that occurs within the region, which for RSGCN are

defined as regional Association of Fish and Wildlife Agencies (AFWA) boundaries. In the SEAFWA Region, an exception is made to exclude the non-contiguous Puerto Rico and U.S. Virgin Islands. Species with at least 50% regional responsibility meet this selection criteria during initial screening, but taxa with less than 50% regional responsibility may still be selected as RSGCN due to high conservation concern or other factors such as range shifts associated with climate change. A federally-listed taxon, for example, may be highly imperiled wherever it occurs regardless of how much of its range falls within a particular region. For RSGCN animals, Regional Responsibility is designated within ranges of 25% (i.e., 100% Endemic, 75-100%, 50-75%, 25-50%, and < 25%). For this RSGCN plants analysis, Regional Responsibility was simplified to 100% in Continental SEAFWA (i.e., endemic), Majority (i.e., greater than 50%), or Minority (i.e., less than 50%) categories. For both plants and animals, taxa with disjunct ranges are included and the RSGCN may be specified as a particular population or subspecies that has higher regional responsibility within the region than the nominal species.

The second selection criterion evaluates the conservation status of the taxon. For animal RSGCN, the conservation status pre-screening criteria includes having at least one of the following (Rice et al. 2019; TCI and NEFWDTC 2023; Terwilliger et al. 2021):

1. An average S-Rank of less than 3.0 within the region (with SH or SX equivalent to 0.5);
2. a G-Rank of G1, T1, G2, or T2;
3. federally-listed in the U.S. as Endangered (E), Threatened (T), Proposed E or T, or Candidate;
4. state listed as Endangered or Threatened in at least two states in the region; or
5. Critically Endangered (CR), Endangered (EN), or Vulnerable (V) on the International Union for the Conservation of Nature (IUCN) Red List.

The identification of RSGCN Southeast plants differed from the animal selection criteria for conservation status by using only the first two of the five criteria listed above, the S-Rank within the region and the G-Rank. For this plant RSGCN analysis, a mode of the S-Ranks in the region was evaluated rather than an average, based on the number of states listing a taxon as S1, S2, SH or SX. The G-Rank criteria included taxa listed as G1, G2, G3, GH, or GX, or in some cases as G4 if at least five states rank the taxon as S1, S2, SH or SX and the taxon has at least 50% Regional Responsibility (i.e., Majority or Endemic). This generally reflects the lack of availability of additional ranking criteria, as plants were not listed (state listed or SGCN) in all states, and are not covered under State Wildlife Grant funding to date. After taxa were pre-screened with these selection criteria for regional responsibility and conservation status, taxa that met both criteria were identified as predicted, or likely, RSGCN for further review. Terwilliger Consulting, Inc., which provided technical assistance to these three regions in the development of RSGCN lists for animals and now plants, compared the pre-screening processes for this plants assessment with the current animal assessment pre-screening methods (TCI and NEFWDTC 2023; Terwilliger et al. 2021). Out of the 1876 plant taxa predicted as likely RSGCN, only 3% (51) would have been pre-screened as not likely RSGCN using all five of the conservation status criteria listed above for animal taxa rather than just the first two criteria. None of these 51 taxa had an average S-Rank of less than 3, all are G3, none are federally-listed, and none have an IUCN Red List status of CR, EN, or VU. Data were not available for the state-listing status of the taxa.

Helonias bullata (Alan Cressler)

A predicted RSGCN Level of Conservation Concern (LoCC) was then assigned for each of the predicted, or likely RSGCN, taxa. For both RSGCN animals and plants, in all three regions with RSGCN lists to date, RSGCN are assigned LoCCs of Very High, High, or Moderate. The predicted LoCC is based on the various combinations of regional responsibility and conservation statuses (e.g., endemic G1 taxa are predicted as Very High LoCC). Although the combinations of these criteria differ for RSGCN animal analyses and this plant analysis, the categorization of the pre-screened RSGCN taxa into these three LoCCs is the same in all regions and for both animals and plants.

The remaining steps for finalizing an RSGCN list of either animals or plants, in all three regions, were identical. The responsible committee of the state regulatory agencies' regional AFWA organization that addresses species conservation (the SEAFWA WDC in this case) identifies the need to develop an RSGCN list and scope of the effort to include specific taxonomic group(s). Terwilliger Consulting, Inc. provided technical assistance to all three regions to develop RSGCN lists, creating general consistency in approaches.

A planning team or steering committee oversaw the methodology development, pre-screening, data management, and facilitated expert review. Once a list of pre-screened, predicted RSGCN was complete, a taxonomic review team for each taxa (with representatives from all states in the region plus key regional experts) reviewed the entire list and voted on each taxon's RSGCN inclusion and status rank from the compiled and analyzed data along with their expertise where data were lacking. To accomplish this, a series of collaborative webinars were facilitated by the planning team to review the project, the selection methodology and pre-screening process and criteria, and to discuss taxa without consensus from the voting results.

The subsequent draft RSGCN list with LoCCs was further reviewed for quality assurance and control by the planning team to verify associated data fields and identify data deficiencies or gaps for future work. In the case of this Southeast plants analysis, a subset of taxa were selected for further review by a regional team of experts to update their G-Rank in coordination with NatureServe at a dedicated workshop hosted by the Atlanta Botanical Garden and Southeastern Plant Conservation Alliance.

The draft RSGCN list, with an associated dataset, was then shared with the regional Technical Team (or taxonomic team for animals) and the SEAFWA Wildlife Diversity Committee (or its counterpart in other regions) for final review. This Southeast plant list, the Northeast 2023 animals list revision, and the 2021 Midwest animals list and associated dataset included data for habitat associations, taxonomy, and state S-Rank and SGCN status data. Cross-walking some of these data fields to standard classification systems was included and encouraged for consistency and broader application to facilitate use of the RSGCN dataset by multiple partners and agencies.

The development of this final Southeast RSGCN plants list differs from previous animal lists in a few minor ways. The sheer number of taxa evaluated (9,271) and subsequently pre-screened as RSGCN (1,824) far exceeded those evaluated and pre-screened for any animal taxonomic group in any region. A single, regional Technical Team of experts reviewed the 1800+ pre-screened plant taxa for this first effort, while the animal taxonomic review includes multiple teams (e.g., birds, reptiles, mammals, freshwater mussels) reflecting the availability of data, expertise and time/capacity for each project.

The most recent Midwest and Northeast animal RSGCN lists included additional categories to identify species as Watchlist or Deferral species, with the former identifying species of assessment priority and the latter for species which the region has conservation concern but low regional responsibility. This plants list does not include a Watchlist or a Deferred category of taxa deferred to an adjacent region for primary stewardship.

Introduction

State of the World's Plants and Fungi (Antonelli et al. 2020) indicated that two-fifths (40%) of all plants are at risk of extinction. Biodiversity in Focus: United States Edition (NatureServe 2023a) reveals that 34% of plants and 40% of animals are at risk of extinction, and 41% of ecosystems are at risk of range-wide collapse. Of the 65 plants that have vanished in North America since European colonization, 25 (40%) have been from the Southeast (Knapp et al. 2021). The Southeastern Plant Conservation Alliance (SE PCA) is a diverse partnership that bridges gaps between local and national efforts while collaborating to restore and prevent the loss of plant diversity. This is achieved by building capacity, facilitating novel partnerships, and leveraging shared resources to stimulate collective success. To date, the SE PCA has allowed partners to leverage funding and conservation actions to address the following actions:

Advocating for Plants

With other nationally recognized groups, we urged the Biden administration to prioritize the conservation of native plants and ecosystems. We also developed a free-access information sheet on regional conservation needs, goals and activities, as well as advocacy flyers to inform non-profits and individuals how they can make a difference. Collaborating with other wildlife conservation professionals and public supporters, we continue to promote Recovering America's Wildlife Act (RAWA).

Improving Recovery Outcomes for the Endangered Species Act

With funding and collaboration from the United States Fish and Wildlife Service (USFWS), we have defined 13 high-priority federally listed species and are implementing collaborative pilot projects for 9 of these in 2021-2024. Primary objectives for this innovative project also include on-the-ground conservation action (including research and management), outreach and engagement with partners and landowners, providing grants and other support for local Plant Conservation Alliances, the promotion of public and private land partnerships, and facilitation of working groups and workshops.

Sarracenia purpurea var. *montana* (Alan Cressler)

Ex situ Gap Analysis

The SE PCA partnered with Botanic Gardens Conservation International, U.S (BGCI-US) to conduct an *ex situ* gap analysis to evaluate living and seed bank collections and identify gaps needing to be filled to meet conservation needs for priority species. The report evaluates how adequately imperiled Southeastern plants are represented in conservation collections worldwide, identifying gaps in global and regional collections of these species that need protection most (Bruns et al. 2022).

List of Regional Species of Greatest Conservation Need (RSGCN)

Working with NatureServe and the NatureServe Network, Terwilliger Consulting, Inc. (TCI), Flora of the Southeastern United States (FSUS), and the Southeast Association of Fish & Wildlife Agencies (SEAFWA), the SE PCA has created the nation's first Regional Species of Greatest Conservation Need (RSGCN) for plants. This will directly enhance data, consistency, capacity, and awareness for plant conservation – both during the development process and as a result of associated research, restoration, regulatory, outreach, and leadership efforts.

The United States supports a larger variety of ecosystems than any other nation (Stein et al. 2000). The Southeastern United States is a biodiversity hotspot – an area rich in unique habitats and plants that, because of anthropogenic influences and climate change, is at increased risk of loss (Cartwright and Wolfe 2016). The Southeastern region is home to over 11,000 native plant species, 30% of which are endemic (Noss et al. 2015).

As part of overall efforts to highlight the role of plants in recovering biodiversity and develop accessible resources to aid strategic conservation efforts, the SE PCA, in partnership with the Atlanta Botanical Garden (ABG), BGCI-US, and NatureServe, developed a preliminary regional priority species list to support the *ex situ* collections gap analysis (Bruns et al. 2022). These products were created to support development of a future list of species of greatest conservation need for Southeastern plants, identify and conduct conservation status assessments for priority species, and to promote the utilization of *Best Plant Conservation Practices to Support Species Survival in the Wild* (Center for Plant Conservation 2019). This would inform collective progress towards securing 60–75% of Southeastern rare plants in seed banks and cultivated conservation collections and implementing recovery and restoration projects that return 10–15% of *ex situ* collections into the wild (BGCI 2016) and support the National Seed Strategy for Rehabilitation and Restoration (Plant Conservation Alliance 2021).

The preliminary regional priority taxa list was based on NatureServe's extensive collection of geographical distributions and rarity rankings (NatureServe 2020). All author names in the SE Plants RSGCN follow Weakley (2022). Taxa were compiled for the continental portion of SEAFWA's footprint, including these 15 states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia. Puerto Rico and the Virgin Islands were not included due to insufficient data, but will be incorporated in a future iteration of this work. A tiered list of taxa was compiled from distribution data maintained by NatureServe and the NatureServe Network for all vascular plant taxa that are native in any portion of the Southeastern region. The geographic footprint was chosen to match that of SEAFWA so that it could be modified for use as a regional list of plant species of conservation concern.

Efforts of the Southeast, as well as the United States as a whole, have the ability to move the dial forward for wildlife conservation through integration of plant-focused efforts with planning and implementation in agencies and other organizations. Because plants form the basis of most ecological systems, other life forms depend on them (Knapp et al. 2020). Documented rates of plant and animal extinction, as well as ecosystem collapse, in the United States echo this connection and the need to conserve natural systems as a whole (NatureServe 2023a). Nearly one third of plant species in the U.S. are at risk of extinction, but only 11% are protected by the Endangered Species Act (ESA). Additionally, the majority of federally threatened and endangered species are plants – yet they receive less than 5% of federal & state recovery funding (Negrón-Ortiz 2014).

The Northeast and Southeast regions of the Association of State Wildlife Agencies (AFWA) have developed RSGCN lists for animals. These are analogous to Species of Greatest Conservation Need (SGCN) lists documented in State Wildlife Action Plans (SWAPs). Plants have not been represented on these RSGCN lists before but have been included to varying degrees in some SWAPs. Identification of highly imperiled and data-deficient plant taxa will inform the development of and inclusion of plants in 2025 SWAPs and identify additional regional plant conservation trends and help state agencies develop plant conservation projects that are suitable and ready for funding under RAWA, if enacted.

The SE PCA approached the SE Plants RSGCN project as an opportunity to facilitate the inclusion of plants in SWAPs. This is in line with our goals of collaborating to prioritize and coordinate conservation activities and leveraging funding through coordinated conservation actions. It is also a critical step in creating a future regional strategy for plant conservation. This list is needed to communicate shared priorities between agencies and other conservation partners. It can be referenced in SWAP revisions, implementation, and in proposals demonstrating research needs and conservation activities for highly imperiled species. Developing this RSGCN list is also a goal of the SEAFWA Wildlife Diversity Committee (WDC) and will complement the existing animal RSGCN list that was developed for the SEAFWA Region in 2018-2019.

Data Disclaimer

The version presented here as the SE Plants RSGCN was last updated in July 2023. NatureServe's Biotics data is up to date as of December 2022. Data sources including Biotics, LANDFIRE, the United States National Vegetation Classification, SWAPs, Flora of the Southeastern United States, and the Ecological Systems crosswalk are continually being updated, and some are still works in progress. Future additions and changes to the data presented in this RSGCN list may affect G-Ranks, S-Ranks, taxonomy, and Levels of Conservation Concern (LoCC).

Data were assembled into the SE Plants RSGCN from the NatureServe Biotics database, which is publicly available as NatureServe Explorer. To find the most up-to-date information on specific taxa, please refer to NatureServe Explorer (https://explorer.natureserve.org).

Regional Background & Opportunity

Panax quinquefolius (Alan Cressler)

The Southeastern Plant Conservation Alliance (SE PCA) was formalized in 2020 and built upon years of strategizing and networking. Our goal is to bridge gaps between local and national efforts to prevent and restore the loss of plant diversity in the Southeast. This is achieved by building capacity, facilitating novel partnerships, and leveraging shared resources to stimulate collective success in our region. Most of the momentum and preliminary work to launch the SE PCA came from the Southeastern Partners in Plant Conservation (SePPCon) gatherings in 2016 and 2020. There were multiple goals and much success associated with these events, which brought together government agencies, land managers, botanical gardens, university programs, experts, professionals, and other interested parties to move the dial forward for plant conservation. Working with a wide range of stakeholders that represent diverse interests and perspectives, this effort has sought to stimulate collective successes in local, state, and regional plant conservation that are informed by partners' needs.

Plant conservation entails a variety of approaches (Guerrant et al. 2004). *Ex situ* efforts are not sufficient for the reestablishment or enhancement of wild populations, which require a variety of *in situ* activities to thrive (Abeli et al. 2019). In order to identify needed actions for at-risk plant species during SePPCon 2016, a list of categories was developed to capture multiple activities that could be assigned based on need by experts during technical planning sessions. Categories of conservation need were defined as follows: land protection & management (land acquisition or conservation easements, prescribed fire, and habitat restoration or enhancement); safeguarding & conservation networking (seed banking or *ex situ* cultivation, *in situ* augmentation or reintroduction, and Plant Conservation Alliance style partnerships); monitoring & research (genetics and taxonomy; reproductive biology or ecology, and surveys/ inventory & monitoring).

Technical planning sessions at the conference used these categories to validate and supplement information on the status and needs for at-risk plant species by engaging individuals from a diverse group of organizations to match needed actions and prioritize them for additional planning efforts. Subsequent sessions included land managers, botanists, and subject-matter experts who delved into these topics based on identifying actions that should be or were already being applied to conserve these species. This effort was geared toward informing initial findings and status assessments being conducted by the U.S. Fish and Wildlife Service (USFWS) for species that had been petitioned for listing under the Endangered Species Act (ESA).

These categories and actions were also included in the survey portion of the RSGCN development process to capture suggested needs while reviewing listed threats. Conducting the RSGCN survey process through the SE PCA allowed us to utilize the network contacts and inclusive approach as a model for supplementing available information. By following this approach, we believe we can further inform and enhance cooperative conservation efforts for plants in our region using the RSGCN list to help state agencies and their partners be aware of needs and able to develop plant conservation projects that are suitable and ready for funding under the Recovering America's Wildlife Act (RAWA). Capacity-building sessions at both SePPCon events provided training opportunities for current, new and potential partners on the best practices and guidelines for conducting *ex situ* and *in situ* conservation work. This contributes to the availability of collaborators to conduct effective work in the Southeast.

During facilitated planning sessions at SePPCon 2020, we were prompted to consider our shared challenges and visions of success – here is what was said: Resource prioritization is important; a formal regional alliance is needed and can be based on various other groups but tailored to Southeastern regional needs; we would benefit from the development of a regional species of greatest conservation needs list for plants; and advocacy efforts are critical. The SE PCA leadership team reiterated these topics as the Alliance came to fruition and began meeting regularly in 2020. We consulted with other initiatives, including regional, national, and international collaborative organizations, to draw on their strengths and lessons learned. Virtual strategic planning in October and November of 2020 led to the development of our mission and high-level goals. From March to July of 2021, additional planning was conducted to inform our goals, action items, and key takeaways (Figure 1). This allowed us to identify available resources, define our needs, list meaningful tasks that will be addressed by the SE PCA network in its first 3 – 5 years, and document collective needs and desired outcomes. Among the preferred outputs, there was a consensus to develop a Regional Species of Greatest Conservation Need (RSGCN). This was identified as an activity that would support short-term outcomes, long-term impacts, and promote more efficient plant conservation in the Southeast and beyond.

One way that progress is being made at the local, regional, and national level in conserving plants, the habitats they help form, and the other organisms that coexist with them has been through engagement with state agencies, natural heritage, and other NatureServe network members, and their working partners is by supporting and assisting with implementation of State Wildlife Action Plans (SWAPs). SWAPs were developed as a prerequisite for State Wildlife

Grants beginning in 2005, are revised every 10 years, and include Species of Greatest Conservation Need (SGCN) lists (AFWA's Teaming with Wildlife Committee 2012). These SGCN have primarily been used to represent animals of conservation concern, although some states have included plants to varying degrees. Inclusion of plants in SWAPs has increased across the region and nation (Figures 2 & 3; Moffett 2020). Currently, Alabama, Florida, Mississippi, North Carolina, Oklahoma, and Texas have committed to including plants as SGCN in their 2025 SWAPS, but all states in the SE plan to include them in some form (M. Humpert and N. Edelson, personal communication, May 3, 2023). If a state does not have their own SGCN list, we hope they can pull from the SE Plants RSGCN list.

Along with utilizing the Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) list to inform SWAPs, we suggest it can promote regional collaboration for imperiled species, along with demonstrating needs for research and conservation. Additionally, we believe it will help to prompt states to clear backlogs by entering their data into state databases (Figure 2). It does not attempt to define priorities for

Figure 1. Overview of the goals of the Southeastern Plant Conservation Alliance

individual states but rather will allow them to use the data within the list to help make decisions and address their own priorities. Species often vary in protection among states, based on available information & rankings. For example, G4 and/or G5 species cannot be added for some SWAPs, while others can adapt more freely. Voluntary standards are documented by the Associate of Fish & Wildlife Agencies (AFWA) to inform best practices for states to follow AFWA's Teaming with Wildlife Committee 2012).

Figure 2. Treatment of plants in State Wildlife Action Plans from Moffett 2020.

Taxonomic updates impact G-Ranks and affect the status of species, along with conservation priorities. This includes the competitiveness of land acquisitions. The Southeast has access to and the support of Alan Weakley and the FSUS Team, which is an invaluable resource. Utilizing the Flora of the Southeastern United States (Weakley et al. 2023) as the reliable taxonomic standard and the inclusion of conservation status assessments and ranking updates in accordance with NatureServe (Faber-Langendoen et al. 2012) with representatives of the NatureServe Network. Additionally, ranking over time is important to capture changes, in particular decline towards rarity. A review resulting in an updated rank of G3, for instance, raises the profile of a species by indicating vulnerability before it potentially becomes imperiled. These are reasons why the RSGCN process and product included a ranking workshop and documents additional needs for assessments and updates. Assessing the hundreds of taxa in the Manual Review Needed category that did not qualify as RSGCN could allow Global

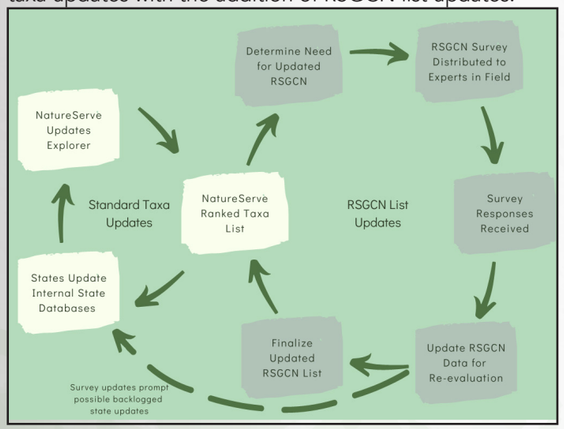
2005 SWAP	2015 SWAP	Alternative List	Weblink	Not Included	
Georgia	California	Alabama	Delaware	Alaska	Montana
Guam	Colorado	Kansas	New Mexico	American Samoa	Nevada
Hawaii	Connecticut	Maryland	North Dakota	Arkansas	New York
Missouri	Louisiana	Maine		Arizona	North Carolina
Nebraska	Massachusetts	New Hampshire		District of Columbia	Northern Mariana Is.
Oregon	Puerto Rico	New Jersey		Florida	Ohio
US Virgin Islands	South Carolina	Rhode Island		Kentucky	Oklahoma
Vermont	Tennessee			Idaho	Pennsylvania
	Texas			Illinois	South Dakota
	West Virginia			Indiana	Utah
				Iowa	Virginia
				Michigan	Washington
				Minnesota	Wisconsin
				Mississippi	Wyoming

Figure 3. Table representing treatment of plants in State Wildlife Action Plant from Moffett 2020.

ranks to be assigned to taxa that are potentially, and would more significantly be addressed, as G3. Ranking workshops are likewise a venue for productive discussions regarding threats and needs, which can be added to NatureServe data and inform needed conservation activities.

The SE PCA embarked on this journey to create a RSGCN for Southeastern plants at the request of the SEAFWA Wildlife Diversity Committee

Figure 4. Visual demonstration of the cycle of standard taxa updates with the addition of RSGCN list updates.



and has harnessed the momentum of the region's Animal RSGCN list that was developed in 2018-2019. Developing the nation's first plant RSGCN list has resulted in unexpected benefits, including the promotion of complementary data updates through stimulation of states' standard process of updating species information. This occurred as a byproduct of states prioritizing data during the survey and technical review for the RSGCN assessment process. These two processes work in tandem to ensure up-to-date species information is available for local, state, and national conservation efforts. The comradery of botanical experts thrived during this process, further enhancing the SE PCA network. Focusing on taxa that occur, or potentially occur, across multiple states has facilitated discussion of *in situ* and *ex situ* conservation needs. It will encourage the development of plans that transcend political boundaries. This will support more cohesive work between partners, including efforts involving the USFWS to assess at-risk and listed species and the natural communities in which they occur (Noss et al. 2021) – it is our shared responsibility and opportunity.

Methodology

Phase 1: Planning and Selection of Methodology

The first phase of creating the Regional Species of Greatest Conservation Need (RSGCN) list began with planning and determining which methodology to use for RSGCN selection and categorization (Very High, High, Moderate, and Low Level of Conservation Concern [LoCC]) for ranking species. The Planning Team, which included representatives from the Southeastern Plant Conservation Alliance (SE PCA), the Atlanta Botanical Garden (ABG), NatureServe, the Southeastern Association of Fish and Wildlife Agencies (SEAFWA), Terwilliger Consulting, Inc. (TCI), and the Flora of the Southeastern United States (FSUS), met to consider different methodologies. These were sourced from literature, RSGCN lists in other regions of the United States, and the expertise of the organizations involved in the Planning Team. The following methods were considered for the creation of the Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) list:

- NatureServe Method - assigns conservation status ranks to species based on rarity (range/distribution and abundance/condition), threats, and trends but the assessment process documents all information pertinent to the species status (Faber-Langendoen et al. 2012). Subnational ranks and supporting data influencing the Global Rank are provided by localized assessments by scientists on the ground.
- PIECES Method - evaluates *ex situ* collections utilizing NatureServe global conservation status ranks and the Botanic Gardens Conservation International database to determine *ex situ* status and the relation between *ex situ* collections and threat rank (Larkin et al. 2016).
- Species Status Assessment Framework - characterizes species status and risk based on the ecological needs of an individual species, the species' habitat, population changes, and expected responses to future ecological changes (U.S. Fish and Wildlife Service 2016).
- Terwilliger Consulting Method - determines RSGCN list eligibility based on a combination of filters for regional responsibility, G-Rank, S-Rank, IUCN Red List, and Federal listing (Terwilliger et al. 2021).
- Wyoming Protocol - taxa are ranked based on totaled scores of each of seven criteria: distribution, number of populations, number of individuals, habitat specificity, intrinsic rarity, magnitude of threats, and population trend (Fertig 2012).

The NatureServe Method was determined to be the most appropriate methodology to use. The methodology utilizes readily available and the most up-to-date possible data. All vascular plants have been evaluated at least once in the NatureServe Method which provides a robust and credible baseline of data. Additionally, other methods that were considered such as the Wyoming Protocol and the Terwilliger Consulting Method use NatureServe data in their evaluations. This led the Planning Team to determine that confidence in the NatureServe data was high enough to utilize the NatureServe Method directly.

Phase 2: Prescreening and Survey Development

A comprehensive list was compiled for all vascular plant taxa that are native in any portion of the Southeastern Continental U.S. region (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia) as defined by SEAFWA. The list was developed using distribution data, specifically nativity and presence by state, maintained by NatureServe and the NatureServe Network (2022). When full species or infraspecific taxa qualified for the list, the higher taxonomic rank was excluded to avoid double counting. For example, *Alnus maritima ssp. oklahomensis* and *Alnus maritima ssp. georgiensis* were included, while *Alnus maritima* was excluded. The resulting list for the region included 9,271 taxa.

To identify the RSGCN, the 9,271 taxa native to the SEAFWA Region were analyzed to assign prescreened LoCC. The initial prescreen levels were based on earlier efforts to prioritize the regional flora to support an *Ex Situ Gap Analysis of High Priority Plant Taxa of Conservation Concern in the Southeast U.S.* (Bruns et al. 2022). NatureServe applied these criteria focused on combinations of global and subnational ranks to the list of native taxa, assigning a LoCC to each taxon, as elaborated on below. These criteria for the initial prescreened LoCC were discussed at Planning Team meetings on January 31, February 8, and February 24, 2022. Final methodology was presented to the Survey Team on March 14, 2022.

NatureServe's Biotics database (2022) provided taxonomic information (accepted name, synonym(s), classification), global, national, and subnational ranks, state-level distribution, and as available, conservation and habitat information. The comprehensive list of native taxa and associated information were compiled in an Excel workbook to support the survey of botanists from the SEAFWA Region. This survey provided the opportunity for feedback on the prescreened LoCC and the data supporting the criteria, e.g., conservation statuses, taxonomy. Input from the surveys led to refinements of this previous method by Bruns et al. (2022), to consider only Extinction Risk.

The Extinction Risk, based on NatureServe Conservation Status Ranks, was used to determine which species have the greatest conservation need. While G1 to G3 species are considered globally at risk of extinction, G4 and G5 are not considered vulnerable to extinction. However, many State level programs track species that have a high extirpation risk (S1 or S2) in their state, independent of the Global Rank, which could be a G4 or G5. This is important as it often protects the edge of a species range or occurrences in unique environments, which may harbor important genetic diversity of the taxon. A subset of these taxa were included for regional prioritization. For example, G4 taxa that are at risk of extinction in a third of Southeastern United States (5 or more states) were given greater priority. In addition, taxa with range ranks like G2G3, G3G4, or G4G5 were given a lower priority than ranks expressing less uncertainty i.e., G2 and G2?, G3 and G3?, or G4 and G4?.

The LoCC were assigned as 'Very High', 'High', 'Medium', and 'Low' or 'Manual Review Needed' and with 'Very High', 'High' and 'Moderate' proposed for the RSGCN to maintain consistency with other regional RSGCN animal efforts. The criteria for assigning priority groups are outlined in Table 1.

Table 1. Method for application of Levels of Conservation Concern. NatureServe's Global Ranks and subnational rank criteria are described for each Level of Conservation Concern. Infraspecific (T) ranks are not listed but follow the same method outlined. *Consideration of subnational ranks (S-Rank(s)) only for states within the Southeastern U.S. region.

Rank	Level of Conservation Concern
GX, GH, G1 (incl. G1, G1G2, G1?), or G2 (incl. G2?)	Very High
G2 (incl. only G1G3, G2G3) or G3 (incl. G3?) with only rounded S1, S2, SH, or SX* S-Ranks	High
G3 (incl. G3?) with SNR or rounded S3, S4* or other rounded G3 (incl. G2G4, G3G4) or G4 (incl. G4?) w/ ≥5 states with rounded S1, S2, SH, or SX* S-Ranks	Moderate
G4 (incl. G3G5, G4?, G4G5), G5 (incl. G5?), or GNA	Low
GNR, GU	Manual Review Needed

Using the species data and LoCC provided by NatureServe, a species assessment survey was developed to distribute to the Survey Team for

feedback. Questions posed in the survey were designed to evaluate currency of the provided data, to share new information that was not yet reported by states to NatureServe, and to collect any additional anecdotal information from surveys about the threats, needs, and general status of each plant.

The species assessment survey was modeled after those previously distributed for the Northeast Association of Fish and Wildlife Agencies (NEAFWA; Terwilliger Consulting 2023), the Midwest Association of Fish and Wildlife Agencies (MAFWA; Terwilliger et al. 2021), and the SEAFWA (Rice et al. 2019) RSGCN animal lists. The NEAFWA, MAFWA, and SEAFWA RSGCN animal lists were facilitated by TCI and their expertise guided the formation of the survey for the SE Plants RSGCN list. The survey was formatted in an Excel file containing species information and classification data provided by NatureServe.

Survey questions were embedded as columns next to the relevant data and included primarily yes/no responses. The response options for each question are included below. All columns included filters to facilitate easier organization and sorting of the nearly 10,000 taxa on the list.

Relevant data included:

- Alternate taxonomic treatments
- Geographic range relative to the SEAFWA Region
- Prescreened Level of Conservation Concern
- G-Rank
- S-Rank
- Presence in each state of the SEAFWA Region

Questions posed in the species assessment survey included:

- Is a taxonomic update that would impact the Level of Conservation Concern needed? If yes, why?
- Do you disagree with the prescreened RSGCN Level of Conservation Concern?
- RSGCN Level of Conservation Concern comments or recommendations
- Global rank review needed?
- State rank review needed?
- What do you perceive being the greatest threats to these species? (Top 3 choices)
- Why are these your top 3 choices threats to this species? (Please write a detailed response)
- What does this species need to enhance conservation? (Top 3 choices)
- Why are these your top 3 choices for how to enhance conservation for this species? Are there any others that were not included here? (Please write a detailed response)

Phase 3: Survey Team Review and Analysis

During the Survey Team Review phase, individuals were selected and invited to participate in the RSGCN list creation process as Survey Team members. State and regional experts were selected based on their involvement with NatureServe Network Member Programs, State Plant Conservation Alliances, Tribal Nations, Federal botany, ecology, and biology programs, and other botanical organizations. The survey was distributed to 130 experts who were encouraged to pass it along to other appropriate experts and the file was made available as a downloadable Excel file from the SE PCA website. Individuals responding to the survey were given 7 weeks (March 14, 2022 - May 5, 2022) to return their feedback.

Surveys were received from 30 respondents and represented all 15 states of the SEAFWA Region included in the Southeastern Plants RSGCN list (Table 2). In total, 1,596 (17.2%) taxa received Survey Team feedback. Responses were combined into a single spreadsheet and the number of individual responses to each question were tallied in R using code provided by TCI. The LoCC for each taxon was treated as the representative sum of data in question. Species were categorized based on the level of consensus in response to the question "Do you disagree with the prescreened RSGCN Level of Conservation Concern?" from the Survey Team: no responses, 100% consensus, >50% no, >50% yes, lower, >50% yes, higher, one response, <50% consensus, 50/50 responses, and >50% I don't know.

Phase 4: Technical Team Review

Phase 4 of the RSGCN process began with sending the combined list of survey responses to the Technical Team. The Technical Team included one representative from each state or NatureServe Network Program organization for a total of 23 members charged with evaluating survey feedback and making decisions on updates to the RSGCN list. The combined survey responses list was distributed to the Technical Team along with an explanation of how responses were categorized and the priority species the team would need to evaluate (Table 3).

Three consensus meetings were conducted virtually in July and August 2022. During these meetings, the Technical Team evaluated and, if appropriate, updated the LoCC for each of 130 taxa that were in the Highest Response Priority category from Table 3. The list of taxa can be found in Appendix 1. Technical Team members discussed survey responses, presented new data or updates that had not yet been reported in Biotics, and gave additional evidence that might impact the LoCC. Following these discussions, Technical Team members voted on how, and if, to change the LoCC.

For example, *Actaea racemosa* (Black cohosh) had a prescreened LoCC of Moderate. Survey feedback indicated that of the nine individuals that responded to the question "Do you disagree with the pre-screened Level of Conservation Concern?," one responded, "I don't know," four responded, "Yes, Level of Conservation Concern is lower than indicated," and four responded, "No." The Technical Team discussed the responses to the question about the LoCC in addition to G-Rank, S-Rank, threats, needs, and general comments. They also brought their own expertise into the discussion. After discussion,

Table 2. Number of survey responses by state

State	Number of Responses
Alabama	1
Arkansas	1
Florida	2
Georgia	5
Kentucky	3
Louisiana	1
Mississippi	2
Missouri	1
North Carolina	3
Oklahoma	2
South Carolina	2
Tennessee	4
Texas	1
Virginia	1
West Virginia	1
Total	**30**

Table 3. Prioritization of Technical Team responses based on Survey consensus to Levels of Conservation Concern

Response Priority	Response Type	Response Type Description
Highest Response Priority	**>50% IDK; 50/50 Responses; <50% Consensus**	Species with mixed responses, with recommendations from the responses to raise, lower or keep the same the RSGCN Level of Conservation Concern. These are the species that need the most attention by the Technical Team. Should the RSGCN Concern Levels for these species be revised, and if so, higher or lower?
Moderate Response Priority	**One Response**	Species that only received one survey response. We need a wider consensus from the Technical Team on whether the recommended change to the RSGCN Level of Conservation Concern for these species should be made or not.
	>50% Yes, Lower; >50% Yes, Higher	Species where there was majority but not unanimous responses to change the RSGCN Concern Level either lower or higher respectively. We need the Technical Team to make final recommendations on whether to revise the RSGCN Level of Conservation Concern lower or higher for these species in accordance with the majority of responses.
	>50% No	Species where the majority of responses indicated no changes were recommended for the RSGCN Level of Conservation Concern. Does the Technical Team agree?
Lowest Response Priority	**100% Consensus**	Species where there was unanimous consensus to either leave the RSGCN Level of Conservation Concern as is or to raise or lower it. We propose to make the changes recommended by the consensus (or leave them as is) unless the Technical Team has a strong objection.
	No Responses	Species that received no responses in the survey. We propose to make no changes to the RSGCN Level of Conservation Concern of these species unless the Technical Team flags species for discussion. If the RSGCN Level of Conservation Concern in Column T is "Low" or "Manual Review Needed", the species is not proposed to be identified as RSGCN at this time.

the majority vote of the Technical Team was to leave the LoCC as Moderate. This process was repeated for each of the 130 species on the Technical Team's list.

During the Technical Team meetings, a pattern was discovered whereby 23 species with a G3/S3 rank were consistently updated to an LoCC of "Moderate" rather than "High." This led NatureServe to propose removing those species from Technical Team discussion and adapting the methodology so that those and similar species were included in the "Moderate" group during screening. Additionally, split ranks were rounded up to a more conservative G-Rank (e.g. G2G3 to G3, G3G4 to G4). This generally changed the prescreened LoCC from "Very High" to "High" or "High" to "Moderate". The Technical Team voted unanimously in favor of the decision. This change is reflected in the methodology description in Phase 2 above.

It should be noted that 21 species were not voted on by the Technical Team. These species included state endemics that could be addressed one-on-one with those states, species with questionable taxonomy, and species that required further discussion with specific states or individuals to ensure the most up-to-date information was being used for decision making. NatureServe followed up with these pending species and reported the results of discussions and research as appropriate updates to those species' LoCC.

Phase 5: Ranking Workshop

The Extinction Risk of the taxon, as determined through NatureServe's Conservation Status Ranks (i.e. G-Rank) was the primary component used to apply the LoCCs. The species assessment survey distributed to the Survey Team asked the question "Global Rank review needed?" The Survey Team suggested 455 taxa in need of a Global Rank review based on their knowledge of the species or current state status, rank review date, or taxonomic issues. Funding supported 50 Global Rank reviews to be included in a ranking workshop with species experts from the NatureServe Network. This approach allowed the states to consider State Rank changes in concert with Global Rank changes or vice versa. Prior to the workshop, a subgroup of the Technical Team evaluated the 455 suggested taxa and proposed 85 high priorities to consider during the workshop. While we expected to complete 50 taxa, a larger list was created to provide flexibility in the event of inadequate data, unresolved taxonomy, or other unforeseen issues that may hinder the review process. In addition, ranking workshop participants and members of the Survey Team, suggested an additional 16 taxa at the workshop bringing the potential list of taxa to rank to 101. Some considerations of the prioritization:

- The geographic range of the taxon must be entirely or nearly completely within the SEAFWA Region, as the workshop only included SEAFWA Region botanists.
- Global Rank reviews that may result in a change in Global Rank that would impact the taxon's inclusion on the RSGCN list, e.g. "Manual Review Needed" to "Very High to Moderate" OR "Very High to Moderate" to "Low" and vice versa, based on notes from survey respondents or projected/suggested rank.

Our approach of focusing on taxa on the edge of inclusion on the RSGCN list, allowed us to minimize the need to manually override the criteria (Table 1), instead correcting ranks at the source, at the state and global level in the NatureServe Biotics database.

Prior to the workshop, necessary taxonomic updates were implemented and preliminary assessments were completed following NatureServe's methods for conservation status assessments (Faber-Langendoen et al. 2012). Information from a variety of sources was used to "score" up to eight factors of rarity, threats, or trends following specific guidance of the methods (Master et al. 2012). The relevant factors for each taxon were entered into the Rank Calculator, an excel based tool, to calculate

Global Ranks (Master et al. 2012) and facilitate collaboration. All attendees were given advance access to a shared word document of preliminary assessments, the prepopulated Rank Calculator, and compiled locality data. At a minimum, the preliminary assessments documented the species geographic range, habitat, but other information pertinent to the species status was incorporated as available.

The Southeastern Plants Regional Species of Greatest Conservation Need Ranking Workshop was held in person at ABG in Atlanta, Georgia during October 17th to 20th, 2023, with virtual participation fully supported. Twenty-eight representatives from 15 states were in attendance (SE Plants RSGCN Ranking Workshop 2022). During the workshop participants reviewed, provided comments, and edited preliminary assessments and maps. Special focus was placed on confirming the geographic range and significant threats and trends influencing the Global Rank. For each taxon assessed, the workshop participants voted on the finalized Global Rank, reaching consensus. We surpassed expectations, reaching consensus and reviewing the Global Ranks of 71 taxa (Figure 3).

After the workshop, NatureServe updated the Biotics database with new Global Ranks and supporting information compiled during and by email after the workshop justifying the current Global Rank. The new assessments and ranks are available to the public on NatureServe Explorer.

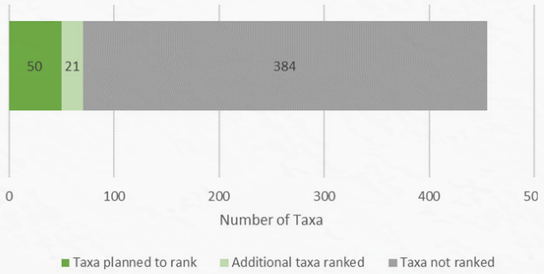
Phase 6: RSGCN Finalization, Analysis, and Report Development

The final phase of the RSGCN process involved finalizing RSGCN LoCCs, reviewing the list with project partners, and adding supplemental data to ensure the RSGCN list was as complete as possible before writing and publication.

RSGCN taxa that were identified as moderate (1,164 taxa) or low (9,142 taxa) response priority for the Technical Team based on Survey Team consensus (Table 3) were discussed with the Planning Team. It was decided that due to the total number of taxa in the moderate and low response priority categories (10,306), pre-screened LoCCs would be maintained except where changes were recommended by the Survey Team with >50% consensus. Those taxa with >50% consensus (438 taxa) had the appropriate changes to their LoCC made by NatureServe, preliminarily finalizing classifications of taxa on the RSGCN list. After updating the LoCCs for all appropriate taxa, the RSGCN list was shared with the Technical Team and the SEAFWA Wildlife Diversity Committee (WDC) for their review and comment.

After finalizing the RSGCN list, the Planning Team began discussions to compile climate tools and vulnerability assessment notes by way of the 2022 United States National Vegetation Classification (USNVC) and NatureServe's LANDFIRE (2022). A postdoctoral researcher position was funded through the United States Geological Survey (USGS) and the Southeast Climate Adaptation Science Center (SE CASC) to lead a portion of this project, creating maps, figures, and text with the purpose of adding climate-vulnerability assessment and ecosystem information to the list of potential RSGCN taxa. The addition of this information will inform future climate-vulnerability studies, species status assessments (SSAs), and SWAP revisions. Furthermore, USNVC Groups and Alliances are being crosswalked with Alan Weakley's *Flora of the Southeastern United States* (2023) to create an Ecological Systems crosswalk.

Figure 5. Taxa ranked at the Ranking Workshop in October 2022. 50 taxa were planned to have Global Ranks updated during the workshop and an additional 21 were ranked. 384 taxa remain with Global Ranks needing evaluation as indicated by the Survey Team.



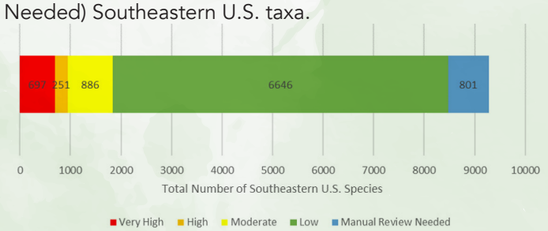
Utilizing the RSGCN list created during this process, additional information is already being gathered and compiled to supplement the list and prove its utility for expanding conservation efforts.

Results

The Big Picture

The original pre-screened taxa list provided by NatureServe included 10,437 taxa from the Southeastern Association of Fish & Wildlife Agencies (SEAFWA) region, excluding taxa from Puerto Rico and the U.S. Virgin Islands. Due to the consistency of database updates (see Regional Responsibility & Opportunity), our confidence in the NatureServe data was very high. Knowing that all taxa would not receive feedback, this allowed survey respondents to prioritize high priority taxa. After evaluation by the survey team and further database updates by NatureServe, 1,166 taxa were removed due to overlapping or outdated taxonomy. The remaining 9,271 taxa make up the Regional Species of Greatest Conservation Need (RSGCN) list and also include those considered Not RSGCN – the Low Level of Conservation Concern (LoCC) and Manual Review Needed taxa (Figure 4).

Figure 6. Graph of RSGCN (Very High, High, and Moderate LoCC) and Not RSGCN (Low LoCC and Manual Review Needed) Southeastern U.S. taxa.



Feedback from species assessment surveys included responses to the question "Do you disagree with the pre-screened Level of Conservation Concern?" for 1,596 (17.2%) taxa. An additional 152 (1.6%) taxa did not receive LoCC feedback but received responses to at least one of the other questions posed in the species assessment survey. In total, 1,748 (18.8%) taxa received feedback during the survey process, 1,517 (86.8%) of which were determined to be RSGCN taxa.

RSGCN

The RSGCN list is composed of 1,824 taxa in the Very High, High, and Moderate LoCC categories. The makeup of each of these categories was defined by a specific combination of G-Ranks and S-Ranks as reported by states and defined by NatureServe. The largest family in the Southeastern U.S., Asteraceae, also boasts the highest proportion of RSGCN taxa (271 RSGCN taxa, 14.86% of RSGCN list). Table 4 outlines the top 10 families by both Southeastern U.S. taxa composition and their occurrence on the RSGCN list. Nine of these families are both highest by Southeastern U.S. taxa composition and RSGCN occurrence. Fagaceae is the 10th highest by Southeastern U.S. taxa composition (152 taxa) but is not top 10 of RSGCN families on the RSGCN list with only 13 RSGCN taxa. Cactaceae has 151 taxa in the Southeastern U.S. but 65 of those taxa are on the RSGCN list bringing Cactaceae to the 10th most prevalent family on the RSGCN list. The final list of RSGCN taxa can be found in Appendix 2.

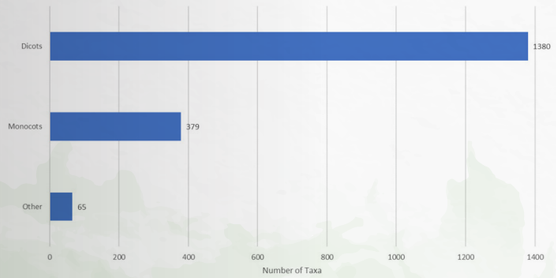
Table 4. Table with top 10 families by Southeastern U.S. taxa composition and by RSGCN occurrence

Family	Total Southeastern Species	RSGCN Species
Asteraceae	1305	271
Poaceae	737	83
Cyperaceae	595	88
Fabaceae	547	129
Rosaceae	384	82
Lamiaceae	255	84
Euphorbiaceae	212	49
Brassicaceae	182	60
Orchidaceae	176	55
Fagaceae	152	13
Cactaceae	151	65
		966

RSGCN data was supplemented with categories based on informal taxonomy and high-level habit by NatureServe. The nine informal taxonomic groups include Dicots (1,380), Monocots (379), Leptosporangiate Ferns (31), Spikemosses and Quillworts (21), Conifers (5), Gnetophytes (3), Adder's-tongues, Grapeferns, and Moonworts (3), Cycads (1), and Clubmosses (1; Figures 5 & 6). Each taxa was also categorized by growth habit(s) and/or sub-habit(s) including herbaceous, woody, succulent, semi-woody, shrub, subshrub, vine, tree, fern, and graminoid. Habit and habit sub-groups are available for many but not all RSGCN taxa. Growth habits follow United States Department of Agriculture Natural Resources Conservation Service (USDA, NRCS) PLANTS database classification (2023).

We have categorized the primary habitats of each of the 1,824 RSGCN plant taxa by assigning each to one or more Groups in the United States National Vegetation Classification (USNVC). The USNVC was chosen because it is an international classification and is a federal standard for use and reporting across federal land-managing agencies. This hierarchical classification is increasingly, though still variably, in use by both federal agencies in the SEAFWA Region, by NatureServe, and by state natural resource, natural heritage, and wildlife agencies.

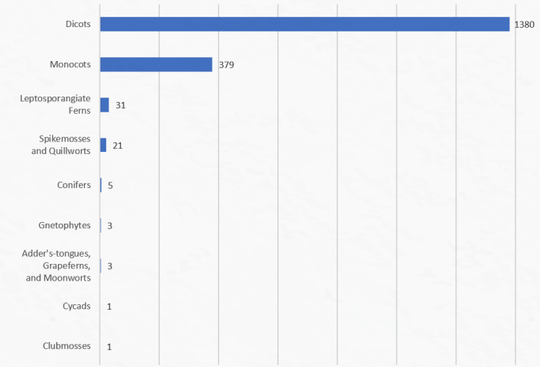
Figure 7. Number of RSGCN taxa in informal taxonomic groups Dicots, Monocots, and Other which includes Leptosporangiate Ferns, Spikemosses, Quillworts, Conifers, Gnetophytes, Adder's-tongues, Grapeferns, Moonworts, Cycads, and Clubmosses.



The effort to attribute USNVC Groups to the RSGCN taxa (a species-habitat crosswalk) by the RSGCN Team was led by Alan Weakley and Scott Ward at the Southeastern Flora of the United States Project at the North Carolina Botanical Garden. We made use of habitat information previously compiled by NatureServe, along with habitat information in the FloraManager system of the Flora of the Southeastern United States, and dozens of traditional floras, combined with personal expertise and experience with many of the species.

A chief outcome of the habitat assignments for the 1,824 RSGCN plant taxa is that these taxa are not at all evenly distributed across habitats in the region. In 2023, imperiled species tend still to be mostly "naturally rare" species, which were always scarce and specialized on the landscape, but that have now been additionally reduced in abundance and imperiled by landscape changes associated with human alterations of ecological processes and uses of land incompatible with those species. Historically common ("matrix") communities did not generally evolve naturally rare plant and animal species, and while some historically common and widespread taxa have become imperiled (*Buchnera americana, Schwalbea americana*, Bobwhite Quail) or even extinct (Passenger Pigeon) by alteration of those common "matrix" communities and

Figure 8. Number of RSGCN taxa by information taxonomic groups in the Other category listed in Figure 7.



their ecological processes, the bulk of imperiled species are habitat specialists of "large patch" or "small patch" habitats.

RSGCN plant taxa are concentrated in particular habitats that were either naturally rare and now have additional threats (South Florida Pine Rocklands, various glade and barren habitats, mountain bogs and fens, etc.) or in matrix communities that have been vastly altered or destroyed (longleaf pine ecosystem communities, Texas-Louisiana Coastal Prairies, etc.). The primary threats to nearly all imperiled taxa are additional loss or alteration of their habitat and additional degradation of the ecological processes driving that community and its associated species. Because habitat loss and degradation are the drivers of species imperilment, the primary effective conservation actions that matter are land-based – land conservation and restoration, improved land management with attention to ecological processes, with fire being an especially important and pervasive issue across the SEAFWA region. The concentration of RSGCN taxa in particular habitats offers us hope of being able to conserve species by focusing our efforts on these parts of the landscape that present rich and efficient conservation targets. The correlation of RSGCN taxa (plants and animals) in these areas offers a conservation efficiency by structuring conservation action by habitats with suites of species, rather than a piecemeal species-by-species approach.

Table 5. Top 15 United States National Vegetation Classification Group assignments for RSGCN taxa

Group	Number of Taxa
Wet-Mesic Longleaf Pine Open Woodland (G190)	96
Xeric Longleaf Pine Woodland (G154)	79
South Florida Slash Pine Rockland (G005)	54
Central Interior Alkaline Open Glade & Barrens (G179)	45
Florida Xeric Scrub (G177)	42
Appalachian - South-central Interior Mesic Forest (G020)	36
South Atlantic & Gulf Coastal Dune & Grassland (G494)	32
Tamaulipan Dry Mesquite & Thornscrub (G099)	30
Blackland & Coastal Tallgrass Prairie (G335)	30
Atlantic & Gulf Coastal Plain Seep (G187)	26
South Atlantic & Gulf Coastal Plain Pondshore & Wet Prairie (G915)	26
Southern Coastal Plain Mixed Evergreen Swamp (G037)	22
Caribbean Hardwood Hammock & Coastal Strand Forest (G765)	18
Southern Mesic Beech - Oak - Mixed Deciduous Forest (G166)	17
Central & Southern Appalachian Seep (G184)	17

The majority of the 846 taxa assigned Groups were affiliated with a single (669 taxa) or two (137 taxa) Groups, but some taxa had up to 7 Group assignments. However, this illustrates the habitat-specific requirements of most RSGCN taxa and the associated conservation challenges. Specifically, Wet-Mesic Longleaf Pine Open Woodland, Xeric Longleaf Pine Woodland, and South Florida Slash Pine Rockland have the greatest numbers of RSGCN plant taxa (96, 79, and 54 taxa respectively). However, 12 ecological groups have more than 20 RSGCN plant taxa including a wide range of ecosystems, from Appalachian groups such as Appalachian-South-central Interior Mesic Forest (36 taxa), groups in the far-Western portion of the SEAFWA region such as Tamaulipan Dry Mesquite and Thornscrub (30 taxa), and coastal seeps such as Atlantic and Gulf Coast Plain Seep (26 taxa). The distribution of RSGCN taxa across these ecosystems demonstrates the vast ecological diversity of RSGCN taxa across the geographic extent of the region. A total of 31 USNVC Groups had at least 10 species, indicating that much of the ecological diversity of the region supports substantial biodiversity of conservation need. Many of these same habitats tend to provide critical habitat for RSGCN animal species, and thus the conservation of these ecosystems and their plant diversity supports conservation of much of the regional biodiversity.

Table 6. Threat and need response options provided to the Survey Team for selection. Respondents were asked to indicate the top three threats and needs for each taxon for which they gave feedback.

Threats	Needs
Residential & commercial development	Land Protection & Management
Agriculture & aquaculture	— Land acquisition or conservation easements
Energy production & mining	— Prescribed fire
Transportation & service corridors	— Habitat restoration or enhancement
Biological resource use	Safeguarding & Conservation Networking
Human intrusions & disturbance	— Seed banking or ex situ cultivation
Natural system modifications	— In situ augmentation/reintroduction
Invasive & other problematic species, genes, & diseases	— Plant Conservation Alliance style partnerships
Pollution	Monitoring & Research
Geological events	— Genetics & taxonomy
Climate change & severe weather	— Reproductive biology/ ecology
	— Needed surveys/inventory & monitoring

Not RSGCN

The 7,747 taxa in the Low LoCC and Manual Review Needed categories are not considered RSGCN taxa. Low LoCC taxa (6,646) are considered globally secure or apparently secure. The Manual Review Needed taxa (801) include taxa that have no Global Rank (GNR) or are unrankable due to taxonomic issues or data deficiencies (GU). This group also includes taxa that are in the process of being removed or added as an accepted name in NatureServe's Biotics database. These names were included for the survey team's review to potentially identify taxa of conservation concern that require an immediate Global Rank review or taxonomic reconsideration. Some taxa initially ranked as GNR or GU were identified as conservation targets and these were prioritized for Global Rank review prior to finalizing the list, moving them to the appropriate LoCC.

For example, while the taxonomy of *Nolina texana* was previously updated in the database, the Global Rank was not yet assessed, and currently carries a rank of GNR. This taxon is common in Texas and Arizona and was not identified for a priority rank review as part of this project.
However, *Euphorbia ouachitana* was GNR, also due to a backlog in the database, and assigned to the Manual Review Needed group. It was identified as a high priority for rank review and a rank of G3 was assigned during the 2022 Ranking Workshop. *Verbena riparia* is an exemplary GU, as it is questionably distinct and has significant uncertainties around its distribution. It could be very rare or presumably extinct.

Regional Endemics

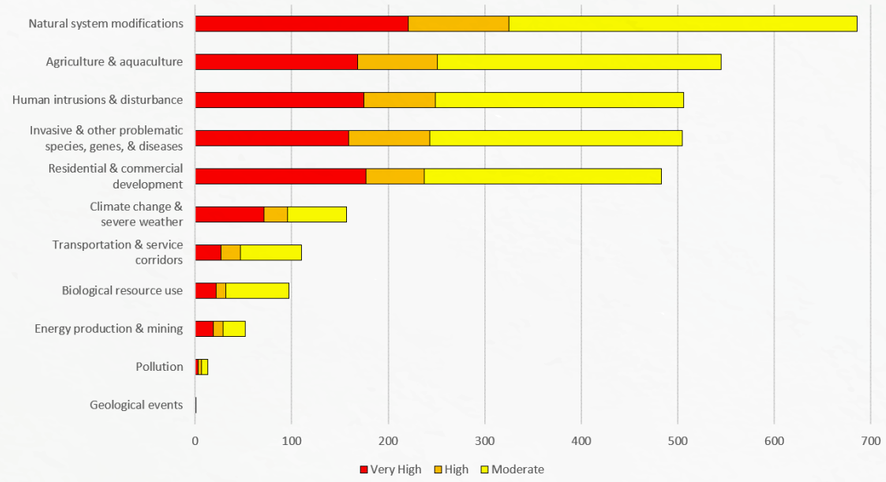
Species that are 100% contained within the continental SEAFWA Region, regional endemics, are of particular importance on the RSGCN list. Of the 9,271 total SEAFWA taxa, 3,027 (29%) are endemic to the SEAFWA Region. More importantly, of the 1,824 RSGCN taxa, 1,306 (72%) are endemic to the SEAFWA Region with 674 (52%) Very High LoCC, 609 (47%) High LoCC, and 23 (2%) Moderate LoCC.

Regional endemic taxa are imperative for Southeastern states to include in their conservation efforts because of their limited range. For example, Georgia Dwarf Trillium *(Trillium georgianum*) is a single-site endemic species under threat of extinction due to development pressures (NatureServe 2023). Ranked G1 with a Very High LoCC, this RSGCN species will rely on targeted conservation activities as one of 383 single-state endemic, G1, and Very High LoCC species on the RSGCN list. Similarly, the hybrid species Refugio Zephyr Lily *(Zephyranthes refugiensis)* is endemic to two counties in Texas but has a significant enough range and population density to be S2 and have a High LoCC. However, this endemic species has not been reviewed since 1991 and the population likely has seen significant changes since that time. A unique example of a Moderate LoCC endemic species is Small Dragonhead Pogonia *(Cleistesiopsis oricamporium)*, a notable orchid species in the Southeastern U.S.. The S-Ranks for C. orciamporium in each state vary throughout the region with the dwindling extent of the range apparent as S-Ranks indicate increased rarity moving up the coast - AL (SNR), FL (SNR), GA (SNR), LA (SNR), MS (S3), NC (S2), SC (S3), VA (S1) (NatureServe 2023). As a G3 species, the opportunity to include additional monitoring and conservation activities for such states as Virginia and North Carolina makes the RSGCN list a valuable tool to pinpoint the needs of specific species along its range.

Threats and Needs

During the survey process, the Survey Team was asked to indicate the top three threats and needs for each taxon. Pre-filled response options were provided for selection and are summarized in Table 6. Threat response options were selected based on high-level groups from NatureServe classifications. Need response options were selected from discussions during Southeastern Partners in Plant Conservation (SePPCON) 2016.

Figure 9. Graphic representation of Survey Team responses to each threat for RSGCN taxa



These responses represent a broad-ranging overview of the threats that are impacting plant populations and what actions could improve conservation outcomes.

Of the 921 taxa for which the Survey Team gave threats and needs feedback, 897 (97%) were RSGCN (Very High, High, or Moderate LoCC). The highest proportion of responses was for Moderate LoCC taxa with 432 (48%) taxa receiving feedback. Very High LoCC taxa received 340 (38%) responses while High LoCC taxa received 125 (14%) responses. The number of responses for each threat and need category by LoCC can be found in Tables 7 & 8.

The threats that received the most feedback indicating the highest risk were natural system modifications; agriculture & aquaculture, invasive & other problematic species, genes, & diseases; human intrusions & disturbance; and residential & commercial development (Figure 8). These

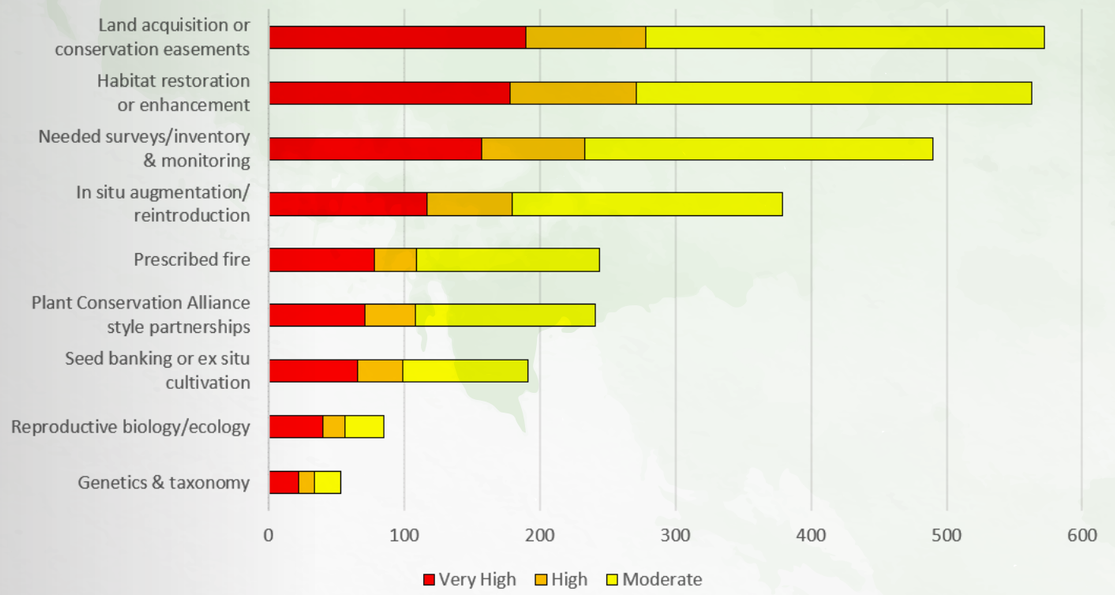
Table 7. Total number of RSGCN taxa with Survey Team responses to each threat category by Level of Conservation Concern

Threats	Very High	High	Moderate	Total
Natural system modifications	221	104	366	**691**
Agriculture & aquaculture	168	83	299	**550**
Invasive & other problematic species, genes, & diseases	159	84	267	**510**
Human intrusions & disturbance	175	74	260	**509**
Residential & commercial development	177	60	248	**485**
Climate change & severe weather	71	25	63	**159**
Transportation & service corridors	27	20	65	**112**
Biological resource use	22	10	66	**98**
Energy production & mining	19	10	24	**53**
Pollution	3	4	6	**13**
Geologic events	1	0	0	**1**

Table 8. Total number of RSGCN taxa with Survey Team responses to each need category by Level of Conservation Concern

Needs	Very High	High	Moderate	Total
Land acquisition or conservation easements	190	88	299	**577**
Habitat restoration or enhancement	178	93	296	**567**
Needed surveys/inventory & monitoring	157	76	260	**493**
In situ augmentation/reintroduction	117	63	203	**383**
Prescribed fire	78	31	136	**245**
Plant Conservation Alliance style partnerships	71	37	135	**243**
Seed banking or *ex situ* cultivation	66	33	94	**193**
Reproductive biology/ecology	40	16	29	**85**
Genetics & taxonomy	22	12	19	**53**

Figure 10. Graphic representation of Survey Team responses to each need for RSGCN taxa



five threats account for 86% of the Survey Team responses to threats. The taxa needs selected by the Survey Team were led by land acquisition or conservation easements (20%) and habitat restoration or enhancement (20%) followed by needed surveys/inventory & monitoring (17%) and *in situ* augmentation/reintroduction (13%; Figure 9).

The feedback for each taxon was discussed during Technical Team deliberations. Utilizing observed threats and needs by the survey team Survey Team allowed the Technical Team to account for future impacts to each taxon. Acknowledging increasing threats such as natural system modifications, agriculture, and invasive species and how those would impact the needs of each taxon helped guide any manual LoCC changes.

In a few cases, the Technical Team updates sparked discussions of needing a Global Rank review from NatureServe. Global Rank updates were performed at the RSGCN Ranking Workshop. During this process, 71 taxa received Global Rank updates, 20 of which had never been ranked (Table 9).

Platanthera integrilabia (Ian Sabo)

Table 9. Current and Previous Global Ranks for 71 taxa reviewed during the ranking workshop.
Bold indicates Global Ranks that changed as part of the workshop.

Scientific Name	Synonyms	Previous Global Rank	Rank Review Date	Rank Change Date	Current Global Rank	NatureServe Rounded Global Rank
Andropogon virginicus var. decipiens	*Andropogon campbellii, Andropogon decipiens*	G5T4	9/14/2022	5/30/1995	G5T4	T4
Aristida condensata		**G4?**	10/6/2022	10/6/2022	**G4**	G4
Camassia scilloides		**G4G5**	10/7/2022	10/7/2022	**G5**	G5
Carex fumosimontana		**GNR**	9/25/2022	9/19/2022	**G2**	G2
Carex tenax		**G5?**	9/27/2022	9/27/2022	**G4**	G4
Cheilanthes alabamensis	*Hemionitis alabamensis, Myriopteris alabamensis, Pellaea alabamensis*	**G4G5**	10/28/2022	10/28/2022	**G5**	G5
Chrysoma pauciflosculosa	*Solidago pauciflosculosa*	G4G5	10/24/2022	10/24/2022	G4G5	G4
Cladrastis kentukea	*Cladrastis lutea*	G4	9/28/2022	4/5/1984	G4	G4
Cleistesiopsis bifaria	*Cleistes bifaria*	**GNR**	10/31/2022	10/31/2022	**G3G4**	G3
Clematis catesbyana	*Clematis micrantha*	**G4G5**	10/28/2022	10/28/2022	**G5**	G5
Clematis versicolor		**G4?**	10/28/2022	10/28/2022	**G5**	G5
Clinopodium georgianum	*Calamintha georgiana, Satureja georgiana*	G5	11/3/2022	11/3/2022	G4	G4
Cyperus tetragonus		**G4?**	10/12/2022	10/12/2022	**G4**	G4
Delphinium carolinianum ssp. vimineum		**G5T5**	11/3/2022	4/12/1988	**G5T5**	T5
Ditrysinia fruticosa	*Sebastiana fruticosa, Sebastiania fruticosa, Sebastiania ligustrina*	G5	9/29/2022	9/24/1987	G5	G5
Dryopteris ludoviciana		**G4**	10/31/2022	10/31/2022	**G5**	G5
Eriogonum tomentosum		**G4G5**	10/31/2022	10/31/2022	**G5**	G5
Erythrina herbacea		G5	9/30/2022	4/27/1988	G5	G5
Eupatorium leptophyllum		**G4G5**	10/24/2022	10/24/2022	**G5**	G5
Euphorbia longicruris		**G4G5**	11/1/2022	11/1/2022	**G3G4**	G3
Euphorbia ouachitana		**GNR**	10/26/2022	10/26/2022	**G3**	G3
Galactia mollis		**G4G5**	10/31/2022	10/31/2022	**G4**	G4
Helenium pinnatifidum		**G4**	10/28/2022	10/28/2022	**G5**	G5
Hibiscus aculeatus		**G4G5**	10/31/2022	10/31/2022	**G5**	G5
Houstonia procumbens		**G5**	9/30/2022	12/15/1988	**G5**	G5
Hypericum fasciculatum		G5	9/30/2022	12/15/1988	G5	G5
Hypoxis sessilis		**G4**	10/14/2022	10/14/2022	**G3**	G3
Ilex longipes	*Ilex decidua var. longipes*	**GNR**	10/25/2022	10/13/2022	**G4**	G4
Ipomoea corymbosa	*Turbina corymbosa*	**GNR**	10/26/2022	9/26/2022	**G5**	G5
Ipomoea macrorhiza		G3G5	10/28/2022	10/28/2022	G3	G3
Juncus georgianus		**G4**	10/28/2022	10/28/2022	**G3**	G3
Lepuropetalon spathulatum		**G4G5**	10/31/2022	10/31/2022	**G5**	G5
Liatris aestivalis		**GNR**	11/1/2022	11/1/2022	**G3**	G3
Liatris secunda	*Liatris pauciflora var. secunda*	**G4G5**	10/25/2022	10/25/2022	**G4**	G4
Lupinus villosus		**G5**	11/3/2022	11/3/2022	**G4**	G4
Luziola fluitans var. fluitans		**G4G5TNR**	9/25/2022	9/20/2022	**G5T5**	T5
Monarda punctata var. arkansana		**G5TNR**	10/25/2022	10/25/2022	**G5T3**	T3
Nemastylis nuttallii		**G4**	11/1/2022	11/1/2022	**G3**	G3
Oldenlandia boscii	*Hedyotis boscii*	G5	11/3/2022	12/15/1988	G5	G5
Paronychia baldwinii	*Paronychia riparia*	**G4**	10/25/2022	10/25/2022	**G5**	G5
Paronychia baldwinii ssp. baldwinii		**G4TNR**	10/25/2022	9/20/2022	**G5T4**	T4
Paronychia baldwinii ssp. riparia		**G4T4?**	10/25/2022	9/20/2022	**G5T4**	T4
Phanopyrum gymnocarpon	*Panicum gymnocarpon*	G5	10/4/2022	1/1/1983	G5	G5
Physalis missouriensis	*Physalis pubescens var. missouriensis*	**G5?**	11/2/2022	11/2/2022	**G2**	G2
Pieris phillyreifolia	*Pieris phillyreifolius*	**G3**	10/28/2022	10/28/2022	**G4**	G4
Platanthera integra	*Habenaria integra*	**G3**	11/7/2022	7/16/2003	**G3G4**	G3
Platanthera nivea	*Habenaria nivea*	**G5**	11/7/2022	11/7/2022	**G3G4**	G3
Ponthieva racemosa		**G4G5**	10/31/2022	10/31/2022	**G5**	G5
Prunus umbellata		**G4G5**	11/1/2022	11/1/2022	**G5**	G5
Sageretia minutiflora		**G4**	11/2/2022	11/2/2022	**G3G4**	G3
Sagittaria isoetiformis		**G4?**	11/8/2022	11/8/2022	**G3**	G3
Scirpus divaricatus		**G5**	10/4/2022	10/4/2022	**G4**	G4
Scleria baldwinii		**G4**	11/2/2022	11/2/2022	**G5?**	G5
Scutellaria mellichampii		**GNR**	10/25/2022	10/5/2022	**G3**	G3
Scutellaria ovata var. rugosa	*Scutellaria ovata ssp. rugosa, Scutellaria ovata ssp. rugosa var. rugosa*	**G5TNR**	10/25/2022	10/25/2022	**G5T4**	T4
Sisyrinchium capillare		**GNR**	10/25/2022	9/23/2022	**G3**	G3
Solanum pseudogracile		**GNR**	10/25/2022	9/27/2022	**G4**	G4
Solidago curtisii	*Solidago caesia var. curtisii, Solidago curtisii var. curtisii*	**GNR**	10/26/2022	10/26/2022	**G5**	G5
Sparganium acaule		**GNR**	10/26/2022	10/26/2022	**G5**	G5
Sphenopholis filiformis		**G4?**	11/3/2022	11/3/2022	**G4**	G4
Stenanthium densum	*Zigadenus densus*	**GNR**	11/7/2022	11/7/2022	**G5**	G5
Stenanthium gramineum var. gramineum		**G4G5TNR**	11/7/2022	11/7/2022	**G4T4**	T4
Stenanthium gramineum var. robustum	*Stenanthium robustum*	**G4G5T3T5**	11/7/2022	11/7/2022	**G4T3**	T3
Stenanthium leimanthoides	*Zigadenus leimanthoides*	**GNR**	11/3/2022	11/3/2022	**G2**	G2
Stenanthium texanum	*Stenanthium macrum*	**GNR**	11/7/2022	11/7/2022	**G3**	G3
Syngonanthus flavidulus		**G5**	10/4/2022	11/18/1988	**G5**	G5
Trichomanes boschianum	*Vandenboschia boschiana*	G4	11/3/2022	4/8/1986	G4	G4
Trichomanes petersii	*Didymoglossum petersii*	**G4G5**	11/3/2022	11/3/2022	**G4**	G4
Valerianella longiflora		**GNR**	11/1/2022	11/1/2022	**G4**	G4
Viola walteri	*Viola walteri var. walteri*	**G4G5**	11/2/2022	11/2/2022	**G5**	G5
Warea cuneifolia		**G4**	10/6/2022	10/6/2022	**G3**	G3

Disjunct and Edge-of-Range Species

NatureServe inquired with Southeastern NatureServe member program (e.g. Natural Heritage Programs) botanists to identify disjunct or edge of range species, found in the region. The approach was to identify taxa that are G4 or G5 (i.e. within the "Low" Level of Conservation Concern [LoCC], and therefore not on the Regional Species of Greatest Conservation Need [RSGCN] list) but rare and tracked in all the states where they occur in the southeast. Potential targets would not be designated RSGCN because of their Global rank but would be ranked as S3, S2, or S1in any southeastern state(s). Upon review of the taxa suggested by each state, only a few species qualified based on its presence and rarity throughout the region and wide-ranging presence outside the southeast.

Plant species considered to be edge-of-range or disjunct species that occur in and are tracked by more than one southeastern state were identified but would likewise be set as state priorities (not regional). These include *Packera schweinitziana* (New England Ragwort) and *Alnus viridis ssp. crispa* (Mountain Alder). *Packera schweinitziana* is a G5 that is disjunct from the northeast into North Carolina and Tennessee and tracked in each southeastern state where it is found. *A. viridis ssp. crispa* is a T5 that is disjunct from the northeast and occurs and is tracked in North Carolina and Tennessee.

All other potential suggestions made by individual states were not rare throughout the southeast. An example is *Pellaea wrightiana* (Wright's Cliff Brake), which is also a G5 and common enough in Texas to not be ranked or tracked, although it is rare in all other southeastern states. In future iterations of the SE Plants RSGCN this topic should be revisited with the NatureServe Network. A detailed geospatial analysis could also be utilized to identify potential candidates for a watch-list of disjunct species of regional concern.

Pellaea wrightiana

Alnus viridis spp. crispa (Robert H. Mohlenbrock)

Packera schweinitziana (JK Marlow)

Culturally Significant Species

Panax quinquefolius (Alan Cressler) *Rudbeckia lactinata* *Muhlenbergia sericea* (Paul Brennan)

Tribal Nation Natural Resource Specialists from Federally recognized Tribes of the Southeast were invited to review the preliminary Regional Species of Greatest Conservation Need (RSGCN) assessment and provide input. Because the survey process was geared towards state programs in order to review available information on species that they track and report to NatureServe, they may not have felt completely included in this opportunity. Additionally, occurrences and status of rare plant species on Tribal lands are not currently included in the available NatureServe network dataset for our region and were not available for review as part of the RSGCN process. Feedback received from partners engaged with Tribal Nations at the local level was that State Wildlife Action Plans (SWAPs) may be an easier place to start. For instance, the Eastern Band of Cherokee Indians could be included in revisions of the North Carolina Wildlife Action Plan, along with participating partners from state and federal agencies that are engaging with one another to varying degrees (G. Kauffman and M. Lavoie, personal communication, April 18, 2022). Alabama invited federally recognized Tribes in the development and revision of their SWAP and had engagement with the Poarch Band of Creek Indians regarding mutually beneficial opportunities for Species of Greatest Conservation Need (SGCN) and their habitats (Alabama DCNR 2016). South Carolina is developing a cultural species section for their 2025 SWAP to incorporate animals and plants that are significant to the Catawba Nation, South Carolina's only federally recognized Tribe. These include Schweinitz's sunflower, Rivercane, and other species (Huckabee Smith 2023).

Native to the dwindling Piedmont Prairie habitats in the Carolinas, Schweinitz's sunflower (*Helianthus schweinitzii*) produces tuberous roots that are a traditional food of indigenous communities in the Carolinas. A team of horticulturists, land managers, and other partners have been working together to prevent extinction of this species. Efforts include collecting seed, studying cultivation methods, and rescuing plants doomed for destruction. More work is needed to ensure a future for this species of ecological and cultural significance, and the Catawba Nation and other partners are stepping up to the challenge.

Rivercane (*Arundinaria gigantea*) forms dense patches used by a wide variety of animals and stabilizes stream banks. Although it is not rare, its habitat is a concern, and some larger wild stands have been lost. The Catawba do not have access to what they need for their cultural artisans' usage in traditional basketry. This issue is not uncommon among tribes in other states and has led to the formation of the The Rivercane Restoration Alliance, facilitated by the United States Army Corps of Engineers Tribal Nations Technical Center of Expertise (TNTCX) The alliance is a collaboration between the United States Army Corps of Engineers (USACE), their Sustainable Rivers Program (SRP), and The Nature Conservancy (TNC) that combines Indigenous and Western Ecological Knowledge to restore rivercane (Fedoroff 2021).

"Like Rivercane, Sweetgrass (*Muhlenbergia sericea*) is not rare but is a species that, along with its habitat, has been declining. It is also culturally important to marginalized groups, including the Gullah Geechee community of the lower Atlantic coast. The Gullah (African American) community in Mt. Pleasant, SC is concerned about the disappearance of this species, which they use to make their famous baskets. They are traveling increasing distances to access needed materials for harvest in rural areas as urban development has eliminated the species." (Anna Huckabee Smith, personal communication, July 10, 2022).

The Southeastern Plant Conservation Alliance (SE PCA) was able to expand inclusion to network members, including Federal agencies and other experts, but consideration of including Tribal Nations and Indigenous Peoples should be planned farther in advance for future revisions of the SE Plants RSGCN. This represents an area where the SE PCA can step up to build relationships and cultivate conversations to create a more inclusive approach for the next iteration, which would support discussions regarding species of conservation concern that include all landowners and stewards throughout their ranges. Any efforts at the state level that inform Tribal and State Wildlife Action Plans would likewise support the inclusion of cultural species in state Species of Greatest Conservation Need (SGCN) lists, as well as development of shareable Tribal SGCN lists. This would create an additional avenue for adding culturally significant plant species to and incorporating them with plant SGCN lists into future versions of the SE Plants RSGCN.

Helianthus schweinitzii (John Flannery) *Arundinaria gigantea* *Allium tricoccum*

These approaches would be a good starting point to address gaps in cataloging and ranking rare species to facilitate more opportunities for supportive partnerships on Tribal lands, if desired by their sovereign stewards. This could include both rare and culturally significant plants, plus identification of their threats and needed conservation actions. Categorizing and prioritizing these would not be based on specific cultural uses or proprietary knowledge, which is privileged information belonging to Tribal Nations and Indigenous Communities. Inclusion of the status and distribution of species within Tribal lands could increase accuracy of their known conservation status and range, where appropriate and welcome by the managers of those lands. More importantly, promoting more cohesive conservation efforts and facilitating co-management of culturally important species should be implemented across ancestral homelands, particularly where access is currently limited or prohibited.

Documentation of threats and needs for species on Tribal lands could result in the allocation of additional resources to support those Tribes in conserving and utilizing culturally significant species and habitats in ways that are meaningful to them, both on and off of Tribal lands.

The RSGCN survey was also shared through the Southeastern Climate Adaptation Science Center (SECASC), which is part of the National Climate Adaptation Science Center network created to support inclusive and sustainable approaches to increasing landscape resilience for wildlife and people centered around climate scientists and Tribal Nations (CASC 2023).

The Climate Adaptation Science Center (CASC) network partners with the United South and Eastern Tribes (USET) to promote informed collaboration with Tribal Nations. They connect other partners with opportunities to engage with and learn from Indigenous Communities and organizations, including the Native American Fish and Wildlife Society (NAFWS) and USET. NAFWS is a national communications network supporting Tribal fish and wildlife management that partners with USET.

The most recent SECASC symposium featured a workshop led by USET and a Tribal Research Scholar working with the United States Geological Survey (USGS) through the Oak Ridge Institute for Science and Education (ORISE). This opportunity served as an introductory training on how to ethically co-create science by building relationships while honoring Tribal sovereignty (Thornbrugh and Schaefer 2022). This has enabled the SE PCA to move forward more appropriately in growing an inclusive network.

SE PCA hopes that the SE Plants RSGCN project will lead to and inform additional efforts geared toward networking and strategy development for plants of cultural, economic, and medicinal concern. We humans are the stewards of this planet, as well as its ecological and cultural keystone species – This includes plants, animals, and ecosystems – some are considered RSGCN, while others are not, but they are all facing threats. It is our responsibility to prevent further losses and work together in restoring species, habitats, and access to resources that have been lost.

Photos of species:
Ginseng (*Panax quinquefolius*) is a cultural, economic, and medicinal RSGCN that is native throughout the Eastern Deciduous forests, threatened by unsustainable wild harvest and poaching, is on the United Plant Savers (UPS) at-risk list, and is tracked by the Convention on the International Trade of Endangered Species (CITES).

Sochan (*Rudbeckia laciniata*) is not RSGCN but is a culturally important food plant of Southeastern Indigenous Communities, including the Cherokee and Creek.

Sweetgrass (*Muhlenbergia sericea*) is not RSGCN but is a culturally significant species of the Gullah Communities of the South Atlantic Coast that is declining in availability due to development and habitat loss and will be included in the 2025 revision of South Carolina's State Wildlife Action Plan (SWAP). Schweinitz's Sunflower (Helianthus schweinitzii) is an Indigenous food plant and crop RSGCN that is federally listed as Endangered and will be included in the 2025 SWAP revision for South Carolina.

River Cane (*Arundinaria gigantea*) is not on the RSGCN list but is an ecological and cultural keystone species threatened across the Southeast by habitat degradation that will be included in South Carolina's 2025 SWAP.

Ramps (*Allium tricoccum*) is not RSGCN but is culturally important and threatened by unsustainable harvest by non-indigenous individuals for personal use and commercial sale as a specialty food item.

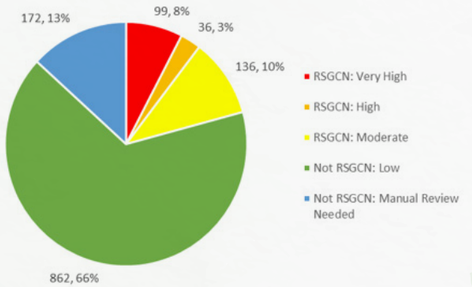
Family-Specific Determinations

Asteraceae

Overview of Results

In total, the Asteraceae (Aster family) includes 1,305 taxa in the Southeastern Association of Fish & Wildlife Agencies (SEAFWA) region and is the largest family in the Southeastern U.S., almost double the number of taxa in the next largest Poaceae. Twenty-one percent of Asteraceae taxa are Regional Species of Greatest Conservation Need (RSGCN) taxa, including 99 Very High Level of Conservation Concern (LoCC), 36 High LoCC, and 136 Moderate LoCC.

Figure 11. Number and percent of Southeastern U.S. Asteraceae at each Level of Conservation Concern

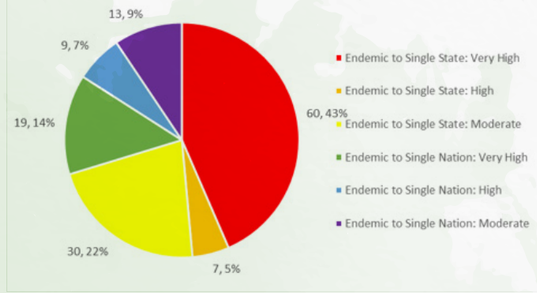


Very High Concern and SEAFWA Endemic Asteraceae

As the largest family of plants in the Southeastern U.S., the Asteraceae has many taxa of Very High LoCC and that are endemic to either the region or a single SEAFWA state. Included in the Very High LoCC are 99 Asteraceae taxa. Eighty five (86%) of these 99 taxa are endemic to the SEAFWA Region, highlighting the need for prioritization of regional conservation efforts. Of the 271 Asteraceae RSGCN taxa, 97 are endemic to a single SEAFWA state – 60 (22%) Very High LoCC, 7 (3%) High LoCC, and 30 (11%) Moderate LoCC There are an additional 41 Asteraceae taxa endemic to the U.S. that occur in at least one or more SEAFWA states and possibly other U.S. regions.

Notable endemic Asteraceae species include Old Cahaba Rosinweed *(Silphium perplexum)*, Georgia Goldenrod *(Solidago georgiana)*, and Buck Creek Ragwort *(Packera serpenticola)*. These three species are all endemic to a single state and have a Very High LoCC. *Silphium perplexum* is particularly threatened by habitat modification, primarily fire regime changes, from anthropogenic activities including housing development, timber industry, and agriculture. This species is dependent on fire and such fire suppression efforts have impacted the ability of *S. perplexum* to thrive within and beyond Perry and Dallas Counties in Alabama (Keener et al. 2023). Similar to *S. perplexum*, *S. georgiana* is a Georgia endemic species that is threatened by conversion of sandhills to agricultural lands, fire suppression, and residential development (Chafin 2020a). Finally, *P. serpenticola* is a North Carolina endemic species known from a single occurrence in the Southern Appalachian Mountains. With rare habitat requirements (serpentine geology) negatively impacted by fire regime changes combined with mining and energy production efforts, the growth of *P. serpenticola* has been significantly suppressed in the Buck Creek area of the Nantahala National Forest of North Carolina (NatureServe 2023b).

Figure 12. Number and percent of Southeastern U.S. endemic Asteraceae by type of endemism and Level of Conservation Concern

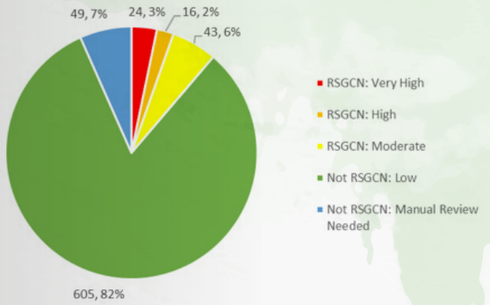


Poaceae

Overview of Results

As the second-largest family in the SEAFWA Region, the Poaceae (Grass family) comprises 737 taxa, with 83 (11%) included in the RSGCN list. Of those on the RSGCN list, there are 24 (29%) Very High LoCC, 16 (19%) High LoCC, and 43 (52 %) Moderate LoCC. The feedback received from Survey Team members during Phase 3 indicates that for the Poaceae RSGCN taxa, the most commonly perceived threat is natural system modifications (73%).

Figure 13. Number and percent of Southeastern U.S. Poaceae at each Level of Conservation Concern

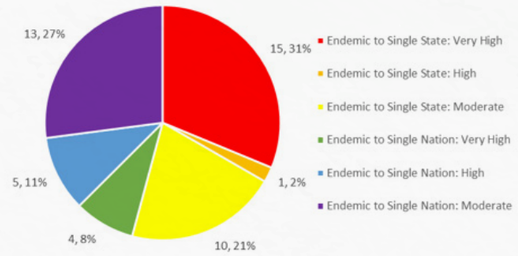


Very High Concern and SEAFWA Endemic Poaceae

The Poaceae comprises a much smaller portion of SEAFWA taxa than the larger Asteraceae (44% fewer SEAFWA taxa, 69% fewer RSGCN taxa). There are 83 Poaceae RSGCN taxa with 24 (29%) considered Very High LoCC. Of these Very High LoCC taxa, 20 (83%) are endemic to the SEAFWA Region and 15 (63%) are endemic to a single SEAFWA state. All 15 taxa occur either within Florida (67%), Texas (27%), or Virginia (7%). Of the 84 RSGCN taxa, 26 (31%) are endemic to a single SEAFWA state – 15 (63%) Very High LoCC, 1 (1%) High LoCC, and 10 (12%) Moderate LoCC. In all, there are 36 Poaceae taxa endemic to a single state and 34 taxa endemic to the U.S. with more than one state in the SEAFWA Region and possibly other U.S. regions.

Notable Poaceae taxa include Silky Bluestem *(Schizachyrium sericatum)*, Sanibel Island Lovegrass *(Eragrostis pectinacea* var. *tracyi)*, and Florida Orange-grass *(Ctenium floridanum)*. *Schizachyrium sericatum* is extremely rare (G1/S1 Florida endemic) and is vulnerable to many environmental and anthropogenic threats in Monroe County, FL. There is only one currently documented occurrence of *S. sericatum* which occurs on a roadside in Monroe County. This leaves this species particularly susceptible to extirpation from simple acts such as mowing, herbicide use, construction, and development (NatureServe 2023). Survey feedback from Phase 3 indicates that human disturbance is currently the most immediate threat to *S. sericatum* due to the current level of imperilment. *Eragrostis pectinacea var. tracyi* is another Florida endemic taxon. However, the last documented occurrences of this taxon were in the 1980s and it is possible that it has been extirpated from the Gulf Coast of Lee, Sarasota, Manatee, and Pinellas Counties. Residential and commercial development, particularly in prime habitat of sand dunes and coastal grasslands, have likely left this variety of *E. pectinacea* extirpated from the wild (NatureServe 2023b). It should be noted that it is unknown if this taxon exists in Central America or the Caribbean and if so, to what extent. One final notable Poaceae species, *Ctenium floridanum*, is found in several counties in Florida (S1) and Georgia (S2). While the geographic extent of *C. floridanum* is narrow, viability of occurrences is considered excellent and with proper management could thrive (NatureServe 2023b). However, in 2021 it was documented that a possible 18% of *C. floridanum* occurrences had been extirpated due to habitat decline and poor management (NatureServe 2023b).

Figure 14. Number and percent of Southeastern U.S. endemic Poaceae by type of endemism and Level of Conservation Concern

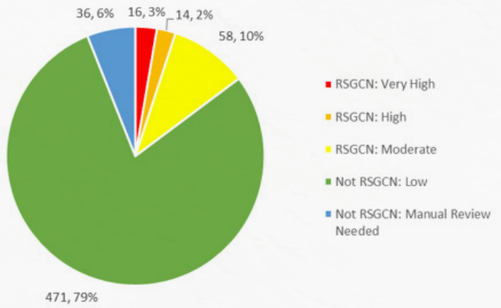


Cyperaceae

Overview of Results

The Cyperaceae (Sedge family) includes 595 (6%) SEAFWA taxa and is the third largest family in the SEAFWA Region. Of the 595 Cyperaceae taxa, 88 (15%) are RSGCN taxa – 16 (18%) Very High LoCC, 14 (16%) High LoCC, and 58 (66%) Moderate LoCC.

Figure 15. Number and percent of Southeastern U.S. Cyperaceae at each Level of Conservation Concern

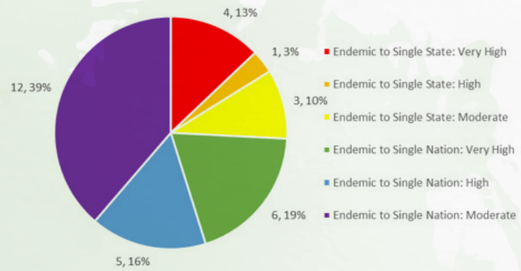


Very High Concern and SEAFWA Endemic Cyperaceae

Sixteen taxa of the Cyperaceae have been identified as Very High LoCC. Endemism is high with 51 (58%) of the 88 RSGCN Cyperaceae taxa being endemic to the SEAFWA Region - 13 (25%) Very High LoCC, 7 (14%) High LoCC, and 31 (61%) Moderate LoCC. Within the SEAFWA Region endemic taxa, there are very few RSGCN taxa with known endemism to a specific state. Only 4 Very High LoCC taxa are known to be endemic to a single state, followed by 1 High LoCC and 3 Moderate LoCC. However, 23 RSGCN Cyperaceae taxa are acknowledged as endemic to multiple SEAFWA states and possibly other U.S. regions – 6 Very High LoCC, 5 High LoCC, and 12 Moderate LoCC.

A selection of Cyperaceae species of particular interest and conservation concern include Bryson's Sedge *(Carex brysonii)*, *Carex fumosimontana*, and Shinner's Sedge *(Carex shinnersii)*. The first species of note, *C. brysonii*, is endemic to two Alabama counties, Lawrence and Winston, with only five occurrences documented (NatureServe 2023b), though it is only vouchered in Winston County (Keener et al. 2023). Each occurrence is found in a <2 km area making this species sparse, though relatively stable, within its range (NatureServe 2023b). Though some of the occurrences of *C. brysonii* appear to be stable, incursion by *Ligustrum sinense* and the potential for land development and lack of management are its primary threats at this time (NatureServe 2023b). The second species of interest, *C. fumosimontana*, is currently ranked G2 and is endemic to the SEAFWA Region with occurrences in Tennessee (S2) and North Carolina (S1). Despite being a relatively new species (2013), it is well-documented with robust populations within each occurrence. However, with its range limited to the high-elevation, high-precipitation Great Smoky Mountains, it is possible that even minor changes in weather and climate conditions may significantly alter the abundance of *C. fumosimontana* (NatureServe 2023b). Finally, *C. shinnersii* is endemic to the SEAFWA Region and occurs in Arkansas (S1), Oklahoma (S1), Kansas (S2), and Texas (S2; NatureServe 2023b). Though spread throughout a long, narrow range, recent development in the western SEAFWA states has proven detrimental to the species, leaving, according to Survey Team responses, only one occurrence in a roadside ditch in Arkansas. Some occurrences have been documented on protected lands such as Boehler Seeps & Sandhills Preserve but it is possible that occurrences exist on Tribal Lands that have not been documented (NatureServe 2023b). This species uniquely highlights one of the benefits of promoting positive relationships with Tribal Nations and Tribal Leaders.

Figure 16. Number and percent of Southeastern U.S. endemic Cyperaceae by type of endemism and Level of Conservation Concern

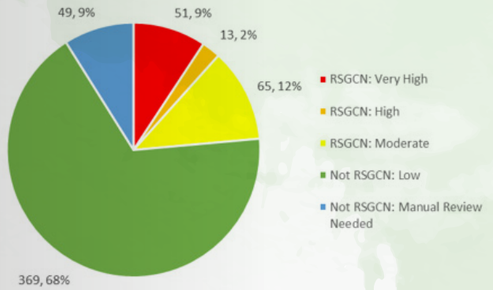


Fabaceae

Overview of Results

The *Fabaceae* (Bean family) is the fourth largest family of plants in the SEAFWA Region. It comprises 547 total taxa, 129 (24%) of which are RSGCN taxa. Though the Fabaceae is the fourth largest family by total SEAFWA taxa, it is the second largest family by number of RSGCN taxa. The breakdown of RSGCN taxa includes 51 (40%) Very High LoCC, 13 (10%) High LoCC, and 65 (50%) Moderate LoCC.

Figure 17. Number and percent of Southeastern U.S. Fabaceae at each Level of Conservation Concern

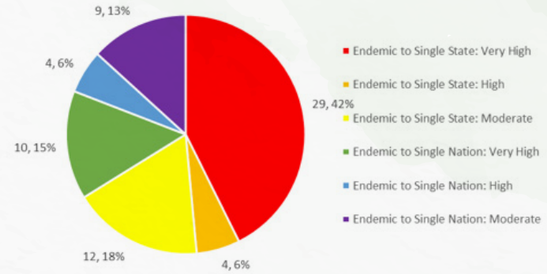


Very High Concern and SEAFWA Endemic Fabaceae

With 129 taxa on the RSGCN list, the Fabaceae includes many rare and endemic taxa within the Very High LoCC category. Of the 51 Very High LoCC taxa, over 50% are endemic to a single state (29 taxa, 57%), while 10 (20%) are endemic to multiple states and possibly other U.S. regions. In looking at the whole of the 129 Fabaceae RSGCN taxa that are single-state endemics, there are 29 (22%) Very High LoCC, 4 (3%) High LoCC, and 12 (9%) Moderate LoCC. It should be noted that there are no SEAFWA single-state endemic taxa in the Manual Review Needed LoCC, indicating that all endemic taxa have been evaluated on some level to accurately represent G-Rank, S-Rank, and/or conservation status.

Notable Fabaceae species include Apalachicola Wild Indigo *(Baptisia megacarpa)*, Cahaba Prairie-clover, *(Dalea cahaba)*, and Leafy Prairie-clover *(Dalea foliosa)*. *Baptisia megacarpa* is a G2 Very High LoCC species endemic to the SEAFWA Region. This species is distributed between the Florida Panhandle (S1), South Alabama (S2), and South Georgia (S1) with unconfirmed sightings occurring in Middle Georgia (NatureServe 2023b). Survey Team responses indicate that despite occurrences documented on protected lands, populations are still threatened by poor management and habitat degradation for those occurrences on private lands. *D. cahaba* is a species endemic to Bibb County, Alabama with narrow habitat requirements, though it is widespread within available habitat (NatureServe 2023b). Feedback from the Survey Team indicates that the most immediate threat to the species is climate change due to specialized habitat requirements. Finally, *D. foliosa* is a species endemic to the U.S. which occurs within the SEAFWA Region in Alabama (S1) and Tennessee (S2) but also occurs outside of the SEAFWA Region. Missing habitat and reproductive requirements for this species, full sun and low competition, are the primary threats despite good viability, which are exacerbated by encroachment of exotic species such as *Ligustrum sinense* and *Lespedeza cuneata*, according to Survey Team feedback and entries to NatureServe Explorer. Additionally, fire regime changes have negatively impacted the spread of *D. foliosa* (NatureServe 2023b).

Figure 18. Number and percent of Southeastern U.S. endemic Fabaceae by type of endemism and Level of Conservation Concern



Rosaceae

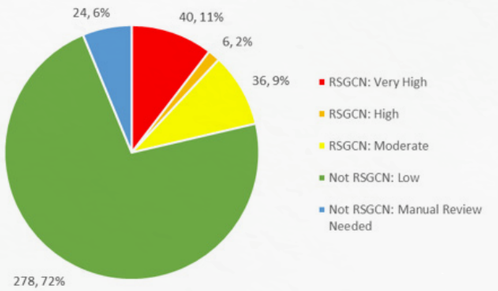
Overview of Results

The Rosaceae (Rose family) is the fifth largest family in the SEAFWA Region with 384 total taxa. Of those 384 taxa, 82 (21%) are RSGCN taxa. Among Rosaceae RSGCN taxa, 48 (49%) are Very High LoCC, 6 (7%) are High LoCC, and 36 (44%) are Moderate LoCC.

Very High Concern and SEAFWA Endemic Rosaceae

With over 80 RSGCN taxa, the Rosaceae make up just over 8% of the total 971 RSGCN taxa in the SEAFWA Region. The composition of Very High LoCC taxa includes G1, G2, GH, and T1 taxa both endemic to a single SEAFWA state (35%) and endemic to multiple SEAFWA states and possibly the U.S. (29%). The remaining 36% of Very High

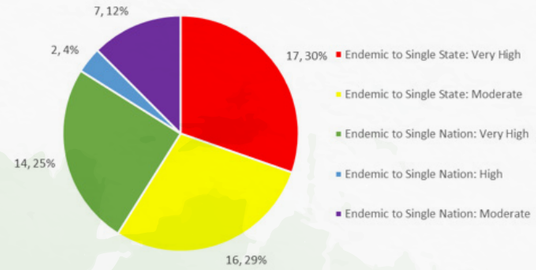
Figure 19. Number and percent of Southeastern U.S. Rosaceae at each Level of Conservation Concern



LoCC taxa either occur in multiple countries or do not have enough distribution information to have endemism and range defined. RSGCN taxa endemic to a single SEAFWA state are made up of 17 (52%) Very High LoCC and 16 (48%) Moderate LoCC. Those taxa endemic to either multiple states and possibly other regions include 14 (61%) Very High LoCC, 2 (9%) High LoCC, and 7 (30%) Moderate LoCC.

Notable Rosaceae taxa endemic to the SEAFWA and adjoining regions include Virginia Spiraea *(Spiraea virginiana)*, Green Hawthorn *(Crataegus viridis* var. *glabriscula)*, and Spreading Avens *(Geum radiatum)*. *Spiraea virginiana* is classified with a Very High LoCC despite being documented in 7 SEAFWA states and in other U.S. regions due to its unique habitat and reproductive requirements. While threatened by changing hydrology and poor habitat management, ineffective reproduction is also a significant threat to the species (NatureServe 2023b). *Spiraea virginiana* is a riparian clonal species that has rarely been documented to reproduce via seed, though germination trials have shown success (Chafin 2020b). The clonality of *S. virginiana* and poor seed recruitment along with habitat disruption have ensured that this species is monitored closely at the Very High LoCC. *Crataegus viridis* var. *glabriscula* is a G5T3T4 (rounded T3) SEAFWA Region endemic taxon classified as S3 in Texas but classified as SNR in Oklahoma, Arkansas, and Kansas (NatureServe 2023b). Surveys published in 2014 indicate that *C. viridis* var. *glabriscula* does occur in Oklahoma despite being ranked SNR (Flora of North America Editorial Committee 2014). One confounding factor in ranking this taxon noted by Survey Team feedback, particularly in Oklahoma, is probable occurrences on Tribal lands which may be inaccessible without established relationships with Tribal Nations and Tribal Leaders. The final Rosaceae species of interest is *G. radiatum*. This species is a Very High LoCC species and occurs in high-elevation mountains in Tennessee (S1) and North Carolina (S2; NatureServe 2023b). With the limited elevation range of *G. radiatum*, the threat of climate change is inevitable. As noted in feedback from Survey Team members, appropriate management to mitigate human disturbance from climbing and camping activities as well as augmentation to promote recruitment and reproduction will be an ongoing requirement to ensure the future survival of *G. radiatum*.

Figure 20. Number and percent of Southeastern U.S. endemic Rosaceae by type of endemism and Level of Conservation Concern



Lamiaceae

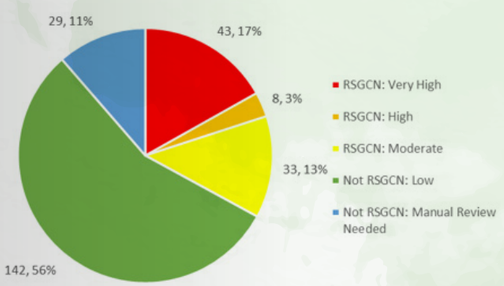
Overview of Results

The *Lamiaceae* (Mint family) comprises 255 taxa in the SEAFWA Region with 84 (33%) being RSGCN taxa. The composition of the Lamiaceae RSGCN list includes 43 (51%) Very High LoCC, 8 (10%) High LoCC, and 33 (39%) Moderate LoCC. The Lamiaceae is the sixth largest family by total taxa and is tied for fourth largest by number of RSGCN taxa with the Poaceae.

Very High Concern and SEAFWA Endemic *Lamiaceae*

Of the RSGCN taxa in the Lamiaceae, the 43 Very High LoCC taxa are all G1, G2, or GH with three T1 subspecies. Thirty-five (42%) RSGCN taxa are recognized as endemic to a single SEAFWA state – 26 (74%) Very High LoCC, 1 (3%) High LoCC,

Figure 21. Number and percent of Southeastern U.S. Lamiaceae at each Level of Conservation Concern

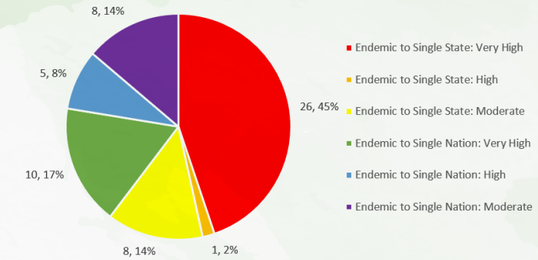


and 8 (23%) Moderate LoCC. Of the 23 taxa that are endemic to at least one SEAFWA state and possibly another U.S. region, 10 (43%) are Very High LoCC, 5 (22%) are High LoCC, and 8 (35%) are Moderate LoCC. Only 3 (4%) RSGCN taxa are endemic to multiple nations but also found within the SEAFWA Region. The remaining 23 (27%) SGCN taxa do not have enough data to classify the level of endemism but are still well-documented and included in the RSGCN list.

A few notable RSGCN species from the SEAFWA Region include Blushing Scrub Balm *(Dicerandra modesta)*, *Dicerandra thinicola*, and Yadkin Hedge-nettle *(Stachys nelsonii)*. *Dicerandra modesta* is a Florida endemic mint species known only from Polk County (NatureServe 2023b). Though the population occurs within the Lake Marion Creek Wildlife Management Area, it has been bisected by the installation of power lines and a pipeline (Florida Native Plant Society 2021). Survey Team feedback also notes that invasive species are a threat to one of the now-bisected populations. *Dicerandra thinicola* is unique in a taxonomic sense.

Originally classified as an unranked hybrid, the Florida Natural Areas Inventory Program acknowledges *D. thinicola* as its own unique species and has ranked it as a Florida S1 endemic species (Florida Natural Areas Inventory 2023). Its narrow habitat, a single dune ridge system in Brevard County, has left this species vulnerable to human disturbance, collection pressure, and habitat destruction. Survey Team feedback also notes that these threats will have long-term impacts on the genetic diversity of the species. *Stachys nelsonii*, the final Lamiaceae species of note, is endemic to Alabama (S1) and known from only one site on Horn Mountain (NatureServe 2023b). While the single occurrence has over 100 documented plants, it, like *D. thinicola*, is divided by a service road and thus more vulnerable to anthropogenic threats which may lead to decline during events such as road maintenance.

Figure 22. Number and percent of Southeastern U.S. endemic Lamiaceae by type of endemism and Level of Conservation Concern

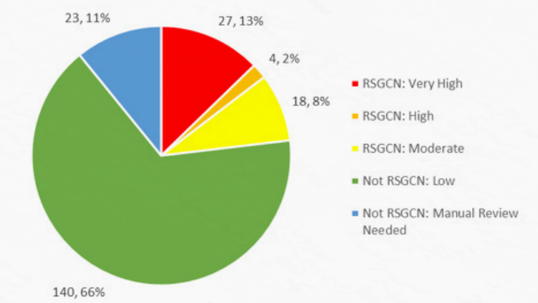


Euphorbiaceae

Overview of Results

The Euphorbiaceae (Spurge family) ranks seventh for the total number of taxa in the SEAFWA Region with 212 taxa. However, it ranks tenth for the number of RSGCN taxa with a total of 49 (23%). More than 50% of the RSGCN taxa are single-state endemics and the breakdown of RSGCN taxa is as follows – 27 (55%) Very High LoCC, 4 (8%) High LoCC, and 18 (37%) Moderate LoCC.

Figure 23. Number an percent of Southeastern U.S. Euphorbiaceae at each Level of Conservation Concern

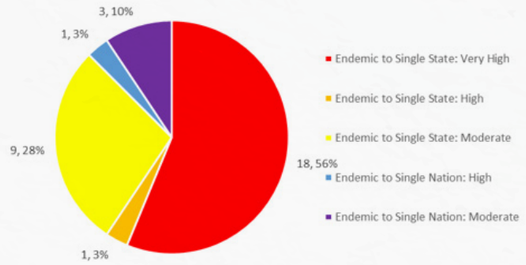


Very High Concern and SEAFWA Endemic Euphorbiaceae

Of the 28 Very High LoCC Euphorbiaceae taxa, endemism is high with 21 (75%) endemic to the SEAFWA Region and 18 (64%) endemic to a single SEAFWA state. Twenty-eight single state endemics account for 18 (37%) Very High LoCC, 1 (2%) High LoCC, and 9 (18%) Moderate LoCC. Only 4 (8%) RSGCN taxa are found within multiple states and possibly other U.S. regions – 1 (2%) High LoCC and 3 (6%) Moderate LoCC. Three additional taxa are documented as endemic to the SEAFWA Region but do not have enough data to support a firm conclusion on their jurisdictional endemism. The Euphorbiaceae has one of the highest regional endemicities for its Very High LoCC taxa of any family in the SEAFWA Region.

Three notable Euphorbiaceae species include Elliott's Croton *(Croton elliottii)*, Telephus Spurge *(Euphorbia telephioides)*, and Garber's Spurge *(Chamaesyce garberi)*. *Croton elliottii* is a G3 species found in Alabama (S1), Georgia (S2S3), South Carolina (S2S3), and has likely been extirpated from Florida (SH; NatureServe 2023b). Most occurrences of this species are in Georgia and South Carolina and the narrow habitat requirements make natural conditions difficult to manage and thus population management is also difficult (NatureServe 2023b). Populations in Florida and some nearby Alabama locations are presumed to be extirpated. Alterations of natural habitat, including hydrology changes, are the largest threats to *C. elliottii*. As a species that requires fluctuating water levels and mechanical disturbance to ensure reproductive success, habitat alterations, hydrological changes, and fire regime changes have all had significant impacts on the ability of *C. elliottii* to thrive both with and without management (NatureServe 2023b). *Euphorbia telephioides* is a G2 Florida (S2) endemic species known only from 3 counties in the state. It is threatened by fire regime changes, primarily as the result of real estate and pine plantation development according to Survey Team feedback. With an estimated 21% of occurrences extirpated between 2007 and 2020, the threat to this species is very high, despite being robust in nature (NatureServe 2023). Finally, *C. garberi* is another Florida (S1) endemic species with very little information regarding population status. It is known to be significantly threatened by fire regime changes and habitat development and has been federally listed on the Endangered Species Act as threatened since 1985 (U.S. Fish and Wildlife Service 1985). Currently only 5 occurrences of *C. garberi* are known and historic populations are believed to be extirpated (NatureServe 2023b).

Figure 24. Number and percent of Southeastern U.S. endemic Euphorbiaceae by type of endemism and Level of Conservation Concern

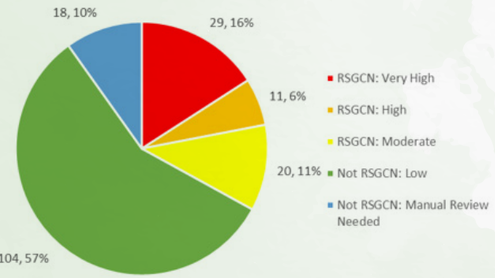


Brassicaceae

Overview of Results

The eighth largest family by both the number of total SEAFWA taxa and RSGCN taxa is the Brassicaceae (Mustard family). The Brassicaceae features a total of 182 taxa in the SEAFWA Region and 60 RSGCN taxa. Of the 60 RSGCN taxa, 26 (43%) are Very High LoCC, 11 (18%) are High LoCC, and 20 (33%) are Moderate LoCC.

Figure 25. Number and percent of Southeastern U.S. Brassicaceae at each Level of Conservation Concern

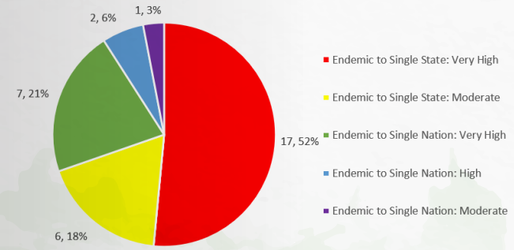


Very High Concern and SEAFWA Endemic *Brassicaceae*

The 26 Very High LoCC taxa of the Brassicaceae include 17 (65%) single state endemic taxa and 7 (27%) are endemic to multiple SEAFWA states and possibly other regions of the U.S. Endemism within Brassicaceae RSGCN taxa is varied. Species endemic to a single state include the previously mentioned 17 (74% of RSGCN taxa) Very High LoCC and 6 (26%) Moderate LoCC. Those endemic to multiple SEAFWA states and possibly other U.S. regions are few, 8 in total – 7 (88%) Very High LoCC and 1 (12%) Moderate LoCC. The percentage of single state endemic taxa (70%) compared to the total number of RSGCN taxa is one of the highest of the 10 largest SEAFWA families evaluated.

Three Brassicaceae taxa of note include Small-anthered Bittercress *(Cardamine micranthera)*, Lyrate Bladderpod *(Lesquerella lyrata)*, and Wright's Thelypody *(Thelypodium wrightii* ssp. *oklahomense)*. *Cardamine micranthera* is a species facing the same threats as many within the SEAFWA Region – habitat alterations, exotic species encroachment, and livestock – according to Survey Team feedback and NatureServe Explorer. At the habitat level, this Very High LoCC species has very few protections and, per North Carolina Heritage botanists, is the only federally listed species with no habitat protections within that state. Protections at the watershed and state levels are imperative for conservation of this species, warranting its categorization at the Very High LoCC. *Lesquerella lyrata* is a Very High LoCC species endemic to 3 counties in Alabama (S1). This species exists on pastureland and roadsides with few protections and is threatened primarily by human disturbance and climate change (NatureServe 2023b; U.S. Fish and Wildlife Service 2018). Finally, *T. wrightii* ssp. *oklahomense* is not endemic to the SEAFWA Region but occurs in Oklahoma (SNR). Within Oklahoma, this subspecies has not been documented since 1970 and is presumed extirpated, however, surveys have not been performed to confirm its status, according to Survey Team feedback (NatureServe 2023b).

Figure 26. Number and percent of Southeastern U.S. endemic Brassicaceae by type of endemism and Level of Conservation Concern

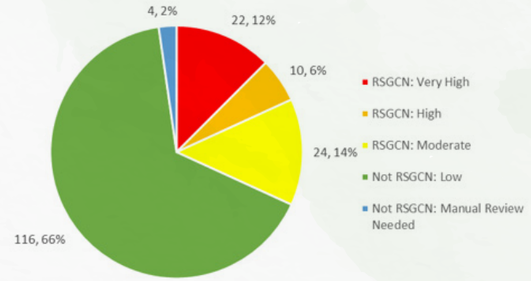


Orchidaceae

Overview of Results

The Orchidaceae (Orchid family) is the ninth largest family within the SEAFWA Region with 176 taxa and is also ninth largest by number of RSGCN taxa with 55 (31%) taxa. Of the 55 RSGCN taxa within the Orchidaceae are 22 (40%) Very High LoCC, 10 (18%) High LoCC, and 23 (42%) Moderate LoCC taxa.

Figure 27. Number and percent of Southeastern U.S. Orchidaceae at each Level of Conservation Concern



Very High Concern and SEAFWA Endemic *Orchidaceae*

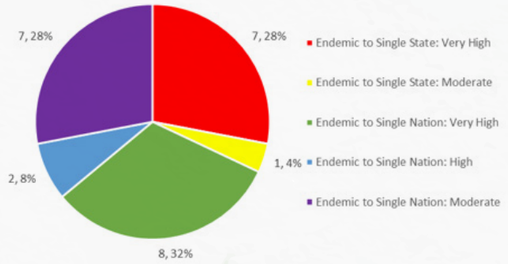
Forty percent of Orchidaceae RSGCN taxa are Very High LoCC. These taxa are all G1, G2, and GX with five varieties ranked as T1 or T2. However, despite having some of the highest possible global conservation status ranks, multiple types of endemism are equally distributed among Very High LoCC taxa. Of the 22 Very High LoCC taxa, 7 (32%) are endemic to a single SEAFWA state, 8 (36%) are endemic to at least one SEAFWA state and possibly other U.S. regions, 6 (27%) are endemic to multiple nations, and 1 (5%) does not have enough data to have endemism determined. This largely even spread of endemics within SEAFWA RSGCN taxa is unique among Orchidaceae taxa within the top 10 RSGCN families.

In evaluating endemism within the entirety of the Orchidaceae RSGCN list (of those taxa which have available data), 8 (14%) are endemic to a single SEAFWA state (7 Very High LoCC and 1 Moderate

LoCC), 17 (30%) are endemic to at least one SEAFWA state and possible other U.S. regions (8 Very High LoCC, 2 High LoCC, and 7 Moderate LoCC), and 20 (36%) are endemic to multiple nations (6 Very High LoCC, 6 High LoCC, and 8 Moderate LoCC). The final 11 (20%) taxa on the RSGCN list do not have enough data to inform the level of endemism (1 Very High LoCC, 2 High LoCC, and 8 Moderate LoCC).

Three species of note within the Orchidaceae include Bayard's Malaxis *(Malaxis bayardii)*, Chapman's Fringed Orchid *(Platanthera chapmanii)*, and Variegated Orchid *(Tolumnia bahamensis)*. *M. bayardii* is a G1 species that is endemic to the U.S. and found historically in South Carolina (SNR), North Carolina (S1), Virginia (SH), and West Virginia (SH). *Malaxis bayardii* is also documented in multiple states within the Northeastern Region of the U.S. as an S1 and SH species. Despite having such a wide range, the level of extirpation and threats to the species are significant and warrant its position in the Very High LoCC category. It is estimated that the SEAFWA Region only represents approximately 10% of *M. bayardii* occurrences (NatureServe 2023b). Survey Team feedback notes that human disturbance as well as invasive species and disease are significant threats to this species and further surveying is required to confirm the level of extirpation in states such as Virginia and West Virginia. *Platanthera chapmanii* is a species with two distinct populations - one in Texas (S1) and one ranging throughout Georgia (S1) and Florida (S2). This species thrives within roadside areas which leaves it vulnerable to anthropogenic pressures including construction, mowing, altered hydrology, and recreational activities (NatureServe 2023b). Additionally, with over 90% of extant populations believed to be in Florida, Georgia and Texas populations are facing particular challenges with managing what few individuals remain, specifically due to habitat loss and altered fire regimes. Despite the significant threats facing *P. chapmanii*, it is listed as a G2 species because of the more stable populations in Florida. Finally, *T. bahamensis* is a unique species because of its distribution in Florida (S1) and its possible occurrence in the Lesser Antilles, though it is documented as a different species in the Lesser Antilles. Despite being evaluated as an S1 species in Florida, the range of *T. bahamensis* in the Lesser Antilles is unknown and thus it is categorized as a G3. However, there does not exist sufficient data to properly categorize its full range and endemism (NatureServe 2023b). Within Florida, *T. bahamensis* is classified as endangered and faces significant threat from collectors and habitat degradation (North American Orchid Conservation Center 2023).

Figure 28. Number and percent of Southeastern U.S. endemic Orchidaceae by type of endemism and Level of Conservation Concern



Cactaceae

Overview of Results

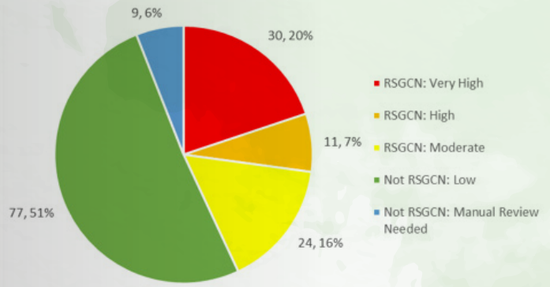
The Cactaceae (Cactus family) is the seventh largest family by number of RSGCN taxa in the SEAFWA Region with 65 taxa. However, it is the eleventh largest by total taxa with 151 taxa. Because this report focuses on the RSGCN taxa, we have chosen to characterize Cactaceae as the tenth family to be discussed because the tenth largest family by total taxa (Fagaceae) only features 13 RSGCN taxa.

The Cactaceae comprises a total of 151 taxa in the SEAFWA Region, with 65 (43%) RSGCN taxa. Of the 65 RSGCN taxa, there are 30 (46%) Very High LoCC, 11 (17%) High LoCC, and 24 (37%) Moderate LoCC.

Very High Concern and SEAFWA Endemic *Cactaceae*

The 30 taxa of Very High LoCC within the Cactaceae have varying degrees of endemism – 18 (60%) are endemic to a single SEAFWA state, 1 (3%) is endemic to at least one SEAFWA state and possibly also to other regions of the U.S., 4 (13%)

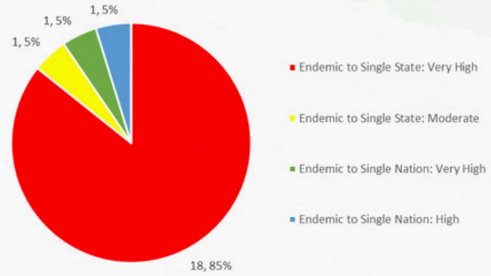
Figure 29. Number and percent of Southeastern U.S. Cactaceae at each Level of Conservation Concern



are found in multiple countries, and 7 (23%) lack enough data to determine the level of endemism. In looking at occurrences within the U.S., the Cactaceae has the highest proportion of single state endemic Very High LoCC taxa relative to any other family (85%). When evaluating the entirety of the Cactaceae on the RSGCN list, taxa that are single state endemics include 18 (28%) Very High LoCC and 1 (2%) Moderate LoCC. An additional 2 taxa are endemic to at least one SEAFWA state and possibly other regions – 1 (2%) Very High LoCC and 1 (2%) High LoCC. Uniquely, the Cactaceae has a significant number of taxa that are found among multiple countries – 4 (6%) Very High LoCC, 4 (6%) High LoCC, and 5 (8%) Moderate LoCC. A striking 48% (31 taxa) of the Cactaceae RSGCN list does not include enough data to make a determination about endemism.

Cactaceae taxa that are noteworthy include Star Cactus *(Astrophytum asterias)*, Florida Semaphore Cactus *(Consolea corallicola)*, and Big Bend Foxtail Cactus *(Escobaria dasyacantha* var. *dasyacantha)*. *Astrophytum asterias* is a G1 species from Texas (S1) with occurrences in Texas and Tamaulipas, Mexico. This taxa is threatened primarily by habitat loss to agriculture and poaching resulting in the loss of more than 30% of individuals (NatureServe 2023b). Because this species is extirpated from much of its historic range and crosses international borders, range-wide conservation of *A. asterias* is difficult and rightfully is categorized as Very High LoCC. *Consolea corallicola* is another Florida (S1) endemic species with only two extant occurrences known in the Florida Keys. Due to its habitat, *C. corallicola* is vulnerable to sea-level rise, climate change, and hurricane damage. Additionally, one population of this species is composed of entirely male plants limiting the reproductive success of the species (NatureServe 2023b). Feedback from the Survey Team notes that due to its ability to root from vegetative pieces, there is plasticity within *C. corallicola's* ability to recover from disturbance events but its other limitations still ensure its inclusion on the RSGCN list. *Escobaria dasyacantha* var. *dasyacantha* is a particularly unique taxon due to its ranking (T3, Moderate LoCC) but lack of data regarding its range and its low population numbers. This taxon is currently only known from the Chihuahuan Desert in Texas but is reported to also occur in New Mexico and Mexico, though these claims are unsubstantiated at this time (NatureServe 2023b). Considered very rare, it was at one time a candidate for listing at the federal level but ultimately was not listed due to changes in listing criteria (NatureServe 2023b). With these setbacks, it is beneficial to have taxa such as *E. dastacantha* var. *dasyacantha* included on the RSGCN list.

Figure 30. Number and percent of Southeastern U.S. endemic Cactaceae by type of endemism and Level of Conservation Concern



Cultural Species & Indigenous Knowledge

The plant conservation community desires increased awareness and resources for our focal organisms, which are not included in most mainstream definitions of wildlife. The Southeastern Plant Conservation Alliance (SE PCA) serves as an advocate and engages with the public to pursue these goals, including the development of educational materials that promote the value of plants and their essential role in a sustainable future. Integration of plant conservation with broader efforts to conserve wildlife in the Southeastern U.S. includes the development of the first Regional Species of Greatest Conservation Need (RSGCN) list for plants, which is aligned with the Southeastern animals RSGCN in scope and geographic area (based on the Southeast Association of Fish and Wildlife Agencies [SEAFWA] footprint).

The SE PCA has been focused on elevating plants to be considered and included with wildlife conservation and natural resource management. We are aware of the need for other ways of knowing, including Traditional Ecological Knowledge (TEK; Armstrong et al. 2007) or Indigenous Knowledge (IK; United States Executive Office of the President 2022) and the inclusion of and engagement with Tribal Nations and Indigenous Peoples. As we educate ourselves on these important topics, we also acknowledge that some of the language associated with western approaches to conservation are harmful and associated with unjust actions inflicted upon Indigenous Communities. These include, but are not limited to, the following terms: integration, prioritization (Hotchkiss 2022), and collaboration (Younging 2018).

The SE PCA commits to inviting and including Indigenous and cultural perspectives while reconciling any conflicting terminologies and actions, which often arise when describing our efforts in a way that aligns plant conservation with wildlife conservation in the western lens. We recognize that IK and cultural needs are not addressed by focusing on taxa and habitats selected and categorized by rarity ranks and geographic distribution. We recognize and seek to honor Tribal Nations and Indigenous Peoples, their knowledge and perspectives, the exercise of treaty rights, innovative programs, and successful management of natural resources, and their sacred and proprietary relationships and information. To this end, SE PCA seeks to serve as allies and support the plant conservation needs and efforts of Indigenous and other historically marginalized communities, who are often dealing with limited resources to address basic needs for social justice (Reed 2022).

The SE PCA network is committed to facilitating a more inclusive forum that ensures all feel welcome and vested, thus increasing our collective capacity for conservation. This would improve wellness by creating shared success, creating new partnerships and positive social interactions that enhance morale, and preserving natural and cultural resources. We must work to build bridges as we learn how to better transcend our silos and weave together the most helpful aspects of our individual approaches to collectively conserve plants. This includes confronting cultural differences and having conversations that address inequities. We cannot adequately conserve biodiversity without creating a diverse and representative network, because cultural diversity must also be emphasized and elevated.

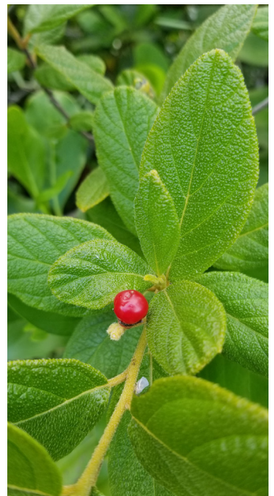
Lophophora williamsii (Dav Hir)

Trillium texanum is a RSGCN endemic to a small area overlapping 3 states, has been petitioned for federal listing, and belongs to a genus of Critical concern for wild harvest impacts by United Plant Savers (UPS)

ESA At-risk & Listed Species

With recent funding, the Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) will further support United States Fish and Wildlife Service (USFWS) Species Status Assessments (SSAs) and their National Domestic Listing Workplan (U.S. Fish and Wildlife Service 2023) addressing listed and at-risk species (petitioned, candidates, or proposed for listing) under the Endangered Species Act (ESA; Endangered Species Act 1982). Next steps supporting these efforts include conducting priority assessments and ranking updates with NatureServe that will inform ESA listing and recovery. This would be achieved by expanding the established Southeastern Plant Conservation Alliance (SE PCA) network and utilizing the RSGCN and Federal Listing Workplan to select taxa for review and collaborative planning. This could involve crosswalking to finer United States National Vegetation Classification (USNVC) levels for all species (Alliance & Community Associations) to address habitat considerations and planning.

We also suggest applying complementary approaches of international partner organizations such as International Union on the Conservation of Nature (IUCN) Red List assessments and Botanic Gardens Conservation International (BGCI) Conservation Action Plans to document threats and partners' knowledge, plan for survival, and act as roadmaps for recovery of species and their associated habitats. Where *ex situ* conservation is appropriate, U.S. Fish & Wildlife Service (USFWS) Controlled Propagation Plans (2000) could be created to guide collection of plant genetic resources for *ex situ* conservation and approved *in situ* reintroduction or augmentation. All of these products would identify future project options and lead to additional successes.



Varronia rupicola is a Caribbean species that could not be assessed or included as RSGCN but is a federally endangered plant that has never been assessed for ranking.

SE PCA partners have clearly demonstrated that intentional collaboration at the regional scale and short-term infusions of funds facilitate increased efficiencies in operations. By leveraging the resources and experience of the SE PCA network, we can support clearing a backlog of USFWS legacy work and be better positioned to meet ongoing challenges and opportunities. The SE Plants RSGCN project will increase our shared knowledge about the federally listed and at-risk species to promote recovery while contributing to conservation of the ecosystems in which they occur. It can also support preclusion of listing species that do not need focused conservation action, and conserve resources for those that do. Increased engagement with partners in Puerto Rico and the U.S. Virgin Islands, as well as Tribal Nations, will support more cohesive collaboration across the region, inform creation of detailed conservation assessments, and drive the development of an inclusive strategic approach for future work based on a model of success.

Amorpha georgiana var. georgiana is a RSGCN variety that is under review for potential federal listing but has not been assessed or ranked in over 20 years.

Echinacea laevigata only occurs in some piedmont prairies and woodlands within ancestral Creek and Cherokee homelands, is a RSGCN listed as threatened after successful collaborations resulted in it meeting criteria to be downlisted, and belongs to a genus considered to be At-Risk by UPS.

Conclusions & Next Steps

Spiraea virginiana (Alan Cressler)

The Southeastern Plant Conservation Alliance (SE PCA) has developed the nation's first Regional Species of Greatest Conservation Need (RSGCN) list for plants. This is already being used to prioritize species for ranking updates, revise State Wildlife Action Plans, and promote long-term conservation goals of imperiled plant species. Next steps have been identified to further progress towards the goals of our alliance and its partners and include sharing the digital RSGCN list and report. Funding has been allocated to print and physically distribute the report as well.

For the Southeastern Plants Regional Species of Greatest Conservation Need (SE Plants RSGCN) to be more efficiently utilized in updating State Wildlife Action Plans (SWAPs), the Southeast Climate Adaptation Science Center is supporting a postdoctoral fellow through the Oak Ridge Institute for Science and Education (ORISE) program to assess climate impacts on rare plant biodiversity using the RSGCN list. This project will compile available information about any previously conducted climate-vulnerability assessments for each species. It will also identify the ecosystems that host the greatest numbers of rare plant species on the list (biodiversity hotspots for rare plants in the Southeast). For a subset of these ecosystems, this project will also produce climate-vulnerability summaries in the form of figures and text to present and interpret climate-change projections, along with potential impacts to ecosystems. Collectively, this information will help provide information that can support efforts to conserve as many rare plants as possible, helping to preserve an important part of the natural heritage of the Southeast.

The goal of the project is to provide rapid, preliminary summaries of climate impacts information for a subset of RSGCN plants and their habitats. This information is needed by SWAP coordinators and authors of SWAP revisions to meet their objective of using the best-available science to support the evaluation and conservation of local Species of Greatest Conservation Need (SGCN). Potential climate impacts will be assessed both for species and for ecosystems using downscaled climate projections and existing ecosystem information. User-friendly climate-impact summaries will be produced. This will be especially helpful for states that are including plants for the first time. They will correspond to the LANDFIRE spatial product commonly used by land managers. Anticipating potential climate impacts to rare plants and their habitats can aid botanical research and conservation efforts and may help inform state-level planning and rare-species monitoring. This information will likewise help inform Species Status Assessments (SSAs) conducted by the U.S. Fish and Wildlife Service (FWS) for listed and at-risk plant species.

To supplement the available information and better assess climate impacts for the SE Plants RSGCN list, the Flora of the Southeastern United States (FSUS) team conducted a crosswalk of their 2022 data with the corresponding Group and Alliance levels of the 2022 United States National Vegetation Classification (USNVC) data. As of August 2023, we characterize this as a Phase One product, which can be further refined and improved. Valuable future enhancements can be added in the following areas:

1. Most taxa have been assigned to a single Group as their primary habitat. For many, they really are completely associated with a single habitat at the Group level of the USNVC hierarchy, but some other species may use one or more other groups to a lesser degree. It would be useful to add those additional Group-level habitats, while also retaining characterization of the primary habitat Group.
2. The hierarchical structure of the USNVC allows flexible use of higher and lower levels in the hierarchy for greater or less specificity. Many of the RSGCN plant taxa are geographically very narrowly distributed, as well as being narrow habitat specialists. For these narrowly endemic and ecologically specialized species, the finer hierarchical levels of the classification (Alliance and Association) would provide a more finely tuned characterization of their habitat association. This finer level would allow more detailed Species Distribution Modeling and other assessments of imperilment of these species, making for a more realistic analysis of land conservation and management needs.

This was facilitated, in part, by ongoing efforts of NatureServe Ecologists and will support mapping the top 10 ecological system Groups to aid in SWAP development. Feedback from experts will inform the addition of suggested Group associations. Any undocumented Groups will be shared with the NatureServe Ecology team and proposed for inclusion, where appropriate in order to enrich the species community information. Additionally, the FSUS team is assisting with downscaled climate projections that inform ecological Alliances, which are a finer-scale representation of ecosystems. This will provide a more solid foundation upon which state agencies and natural heritage programs can address inclusion of Conservation Opportunity Areas (COAs) in their SWAPs. Although most states mapped the distribution in their SWAPs, a region-wide standard has not been established. We hope these efforts can facilitate the development of a consistent approach for the Southeastern states to identify and include ecological systems in conservation planning. This advancement of habitat associations for plants will inform SWAP revisions, as well as the next animal RSGCN revision. These tools will promote more holistic conservation and set the stage for more inclusive and comprehensive and effective landscape conservation of priority species.

Another resource that promotes consistency across jurisdictional boundaries is the Southeast Conservation Blueprint. This product was created by the Southeast Conservation Adaptation Strategy (SECAS) to address urbanization, development, and climate change as part of cross-sector collaborations to sustain natural and cultural resources across the regional landscape (SECAS 2021). SECAS was initiated by SEAFWA States and federal agencies of the Southeast Natural Resource Leadership Workgroup (SENRLG). The Blueprint is a valuable resource for SWAPs that could likewise be used by plant conservationists to identify target species and ecological groups for conservation activities. As it is updated, the Blueprint could highlight ecological associations affiliated with SE Plant RSGCN for planning and implementation that supports identification of COAs and promotes regional and state efforts in reaching the SECAS goal of improving the health, function, and connectivity of Southeastern ecosystems by 10% before 2060 (SECAS 2018).

The urgency we face at this time is a global concern that is being similarly addressed by global organizations, such as the United Nations (UN). The new Global Framework, although still in draft form, outlines targets and 'milestones' for 'living in harmony with nature' by 2050. During their 2022 biodiversity conference proposed goals were developed, as well as their 30x30 initiative that aims to protect 30 percent of Earth's land and water by 2030 (United Nations Convention on Biological Diversity 2021). The current UN Decade on Ecosystem Restoration (United Nations 2021) aims to prevent, halt and reverse the degradation of

ecosystems worldwide to simultaneously address poverty, climate change, and current threats of mass extinction. Coordinating members and leaders of the Southeastern Plant Conservation Alliance are connected with these and other international efforts and leverage them to inform national, regional, and local partners and projects.

Our expectation is to revise the SE Plants RSGCN every 5 - 10 years. This would allow us to revise to incorporate data updates, including State or Tribal SGCNs. Although the current SE Plants RSGCN does not include Puerto Rico or the U.S. Virgin Islands, the project can be used to inform the enhancement of data availability and prioritization of species as preliminary steps toward informing updates to SGCNs for these U.S territories. Leveraging existing relationships with partners there through the SE PCA network will support effective planning for their needs and development of an RSGCN that encompasses them as part of the larger SEAFWA footprint in the future. We expect it is possible for the U.S. territories to be included in the 2nd or 3rd iteration.

Inclusion of Tribal Nations will support more cohesive collaboration across the region, inform the creation of detailed conservation assessments, and drive the development of a strategic approach for future work based on a model of success. Culturally significant plants also need focused planning, as well as engagement with additional partners to develop a stronger rapport and support more efficient assessments with a more diverse network. This applies to all historically underprivileged groups; more conscientious inclusion is needed to build trust. This would increase equity for resource access and management for Black, Indigenous, and People(s) of Colour (BIPOC). Sustainability applies here, as well as to medicinal plants that are in economic trade. Developing a strategic approach, timeline, and budget for future work of this nature in a culturally sensitive manner aimed at supporting their needs will be more informative to future revisions of the SE Plants RSGCN and support the development of a roadmap for the conservation of economic, medicinal, and culturally significant species.

The SE Plants RSGCN is a powerful tool for communicating partners' shared priorities. It will inform strategies to prevent and restore further loss of diversity in our region and serve to integrate plants with broader efforts to conserve wildlife. The RSGCN can help increase public awareness of plants' critical and essential roles in ecosystem stability, therefore advocating for the need to protect them. This speaks to the resources that would be provided with the passage of Recovering America's Wildlife Act, which would further support Tribal and State Wildlife Action Plans. Increasing available funding for plant species and habitat projects supports the animals that also depend on them. Funding programs in Native American and urban communities that include restoration of native plants will reach further to climate resilience, promote public health, and social & environmental justice.

Unless we enact change, an estimated 1,000,000 plant and animal species – because of habitat destruction, invasive species, pollinator loss, climate change, and other threats – face extinction (IPBES 2019). The Southeast can serve as a model of leadership for the nation in their ability to address needs and achieve success. Our collective ability to assess and preserve the biodiversity of plants and ecosystems underlies the sustainable and continued existence of other organisms, including humans (Knapp et al. 2021). This is achieved by uniting efforts in the region and beyond and demonstrating that plant conservation is a crucial asset in conserving the systems that support all other lifeforms, as well as our own well-being.

Echinacea purpurea (Leonid Golovin)

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Additional Resources

Botanic Gardens Conservation International (BGCI) Conservation Action Plans
https://www.bgci.org/resources/bgci-tools-and-resources/conservation-action-plans/

Guidance for Federal Departments and Agencies on Indigenous Knowledge
https://www.whitehouse.gov/wp-content/uploads/2022/12/OSTP-CEQ-IK-Guidance.pdf

International Union on the Conservation of Nature (IUCN) Red List Assessments
https://www.iucnredlist.org

Native American Fish and Wildlife Society (NAFWS)
https://www.nafws.org/about/

NatureServe
www.natureserve.org

Oak Ridge Institute for Science and Education (ORISE)
https://orise.orau.gov/

Southeast Conservation Adaptation Strategy (SE CAS) Resources
https://secassoutheast.org/resources

Southeastern Climate Adaptation Science Center (SECASC) Tribal Partners
https://secasc.ncsu.edu/home/partners/tribal-partners/

Southeastern Plant Conservation Alliance (SE PCA)
www.se-pca.org

United Nations (UN) Decade on Restoration
https://www.decadeonrestoration.org/

United South and Eastern Tribes
https://www.usetinc.org/

United States National Vegetation Classification
https://usnvc.org/

Appendix 1

Scientific Name	Original Pre-Screened LoCC	LoCC After Technical Team Discussion
Actaea racemosa	Moderate	Moderate
Agalinis auriculata	Moderate	High
Agalinis skinneriana	Moderate	High
Ageratina altissima var. roanensis	High	Moderate
Allium allegheniense	High	High
Allium oxyphilum	Very High	Very High
Amorpha schwerinii	High	High
Amphianthus pusillus	Very High	Very High
Andropogon arctatus	High	Moderate
Anemone quinquefolia var. minima	High	High
Arabis patens	High	High
Aristida mohrii	Very High	Very High
Aristida patula	High	Moderate
Arnoglossum diversifolium	Very High	Very High
Asarum rosei	Very High	Very High
Asimina obovata	High	Moderate
Asplenium heteroresiliens	Very High	Very High
Astragalus obcordatus	High	High
Astragalus tennesseensis	High	Moderate
Aureolaria patula	High	Moderate
Baptisia calycosa var. villosa	High	Moderate
Baptisia megacarpa	Very High	Very High
Baptisia simplicifolia	High	Moderate
Bejaria racemosa	High	Low
Berlandiera subacaulis	High	Low
Bigelowia nuttallii	High	Low
Borodinia serotina	Very High	High
Botrychium simplex var. simplex	Moderate	Moderate
Calamovilfa curtissii	High	Moderate
Calystegia catesbeiana	High	Moderate
Calystegia catesbeiana ssp. catesbeiana	Very High	Low
Cardamine clematitis	High	High
Carex biltmoreana	High	Moderate
Carex decomposita	High	High
Carex lucorum var. austrolucorum	High	Moderate
Carex misera	High	Moderate
Carex oxylepis var. pubescens	High	Taxon Removed from List
Carex ruthii	High	Moderate
Cayaponia quinqueloba	Moderate	Low
Chaerophyllum procumbens var. shortii	High	Moderate
Chamaecrista deeringiana	High	Moderate
Cheilanthes alabamensis	Moderate	Low
Chelone obliqua var. erwiniae	High	Moderate
Chelone obliqua var. obliqua	High	Moderate
Chrysopsis floridana	High	High
Chrysopsis godfreyi	Very High	High
Cicuta maculata var. bolanderi	Moderate	Moderate
Cirsium horridulum var. vittatum	High	Low
Collinsonia serotina	High	Manual Review Needed
Coreopsis latifolia	High	Moderate
Crataegus flava	Very High	Very High
Crataegus mendosa	High	High
Crataegus senta	Very High	Very High
Cuscuta indecora var. indecora	Moderate	Moderate
Dasistoma macrophylla	Moderate	Low
Delphinium exaltatum	High	High
Dichanthelium cryptanthum	High	Manual Review Needed
Echinacea laevigata	Very High	High
Eleocharis bifida	High	High
Eriochloa michauxii	High	Moderate
Eupatorium maritimum	Very High	Very High
Euphorbia purpurea	Moderate	Moderate
Galium arkansanum var. pubiflorum	Very High	Very High
Garberia heterophylla	High	Moderate
Gaylussacia brachycera	High	High
Gentiana austromontana	High	Moderate
Gymnocarpium appalachianum	High	Moderate
Helenium virginicum	High	Moderate
Helianthemum nashii	High	Moderate
Heteranthera missouriensis	High	Moderate
Heuchera caroliniana	High	Moderate
Heuchera parviflora var. puberula	High	Moderate
Hexastylis sorriei	Very High	Very High
Houstonia longifolia var. glabra	High	Moderate
Hymenocallis pygmaea	Very High	High
Hypericum edisonianum	Very High	High
Ilex opaca var. arenicola	High	Moderate
Juncus caesariensis	Very High	High
Krigia montana	High	Moderate
Lesquerella ovalifolia ssp. alba	High	Moderate
Liatris virgata	Manual Review Needed	Manual Review Needed
Lysimachia loomisii	High	Moderate
Macbridea caroliniana	Very High	High
Malus angustifolia var. puberula	High	Moderate
Minuartia cumberlandensis	High	High
Mirabilis exaltata	High	Moderate
Muhlenbergia glabriflоris	Moderate	Moderate
Nemastylis floridana	Very High	Very High
Nolina greenei	Very High	High
Nuphar lutea ssp. ulvacea	Very High	Very High
Oenothera riparia	Very High	High
Opuntia phaeacantha var. camanchica	High	Moderate
Packera serpenticola	Very High	Very High
Parietaria praetermissa	High	Moderate
Paronychia erecta	High	Moderate
Parthenium auriculatum	High	Moderate
Penstemon smallii	High	Moderate
Persea humilis	High	Moderate
Phaseolus polystachios var. sinuatus	High	Moderate
Phlox buckleyi	Very High	High
Physalis angustifolia	High	Moderate
Platanthera shriveri	Very High	Very High
Poa paludigena	Moderate	Moderate
Polygala lindheimeri var. parvifolia	High	Moderate
Potamogeton floridanus	Very High	Very High
Rhynchospora cephalantha var. attenuata	High	Moderate
Ripariosida hermaphrodita	Moderate	Moderate
Rubus trux	High	Moderate
Rubus whartoniae	Very High	Very High
Sagittaria graminea ssp. weatherbiana	High	Moderate
Sarracenia alabamensis	High	Taxon Removed from List
Schizachyrium maritimum	High	Moderate
Schizachyrium stoloniferum	High	Moderate
Scutellaria altamaha	Very High	High
Scutellaria arguta	Very High	Taxon Removed from List
Scutellaria incana var. 1	High	Taxon Removed from List
Selaginella tortipila	High	Moderate
Silene virginica var. robusta	Very High	High
Solidago simulans	Very High	Very High
Spiranthes ovalis var. ovalis	High	Moderate
Stachys clingmanii	Very High	Very High
Streptanthus squamiformis	Very High	High
Symphyotrichum georgianum	High	Moderate
Symphyotrichum rhiannon	Very High	Very High
Synandra hispidula	Moderate	Low
Talinum mengesii	High	Moderate
Thelypodium wrightii ssp. oklahomense	Very High	Very High
Thermopsis villosa	High	Moderate
Trillium pusillum var. virginianum	High	High
Trillium vaseyi	High	Moderate

Appendix 2

Scientific Name	RSGCN Level of Conservation Concern	G-Rank
Abies fraseri	Very High	G2
Abronia ameliae	Moderate	G3
Abronia macrocarpa	Very High	G2?
Acacia schaffneri var. bravoensis	Moderate	G5T3T4
Achnatherum curvifolium	High	G3
Acleisanthes acutifolia	High	G3
Acleisanthes crassifolia	Very High	G2
Acleisanthes parvifolia	Moderate	G3
Acleisanthes wrightii	Very High	G2
Aconitum reclinatum	Moderate	G3G4
Actaea racemosa	Moderate	G3G4
Actaea rubifolia	Moderate	G3
Adelia vaseyi	Moderate	G3
Aeschynomene pratensis var. pratensis	Moderate	G4T3
Aeschynomene virginica	Very High	G2
Aesculus parviflora	Moderate	G3
Aesculus pavia var. flavescens	Moderate	G5T3?
Agalinis aphylla	Moderate	G3G4
Agalinis auriculata	Moderate	G3
Agalinis caddoensis	Very High	GH
Agalinis calycina	Very High	G1
Agalinis decemloba	Moderate	G3G4
Agalinis densiflora	High	G3
Agalinis divaricata	Moderate	G3?
Agalinis filicaulis	Moderate	G3
Agalinis flexicaulis	Very High	G1G2
Agalinis georgiana	Very High	G1
Agalinis laxa	Moderate	G3G4
Agalinis navasotensis	Very High	G1
Agalinis skinneriana	Moderate	G3G4
Agalinis tenuifolia var. polyphylla	Moderate	G5T3
Agalinis virgata	Moderate	G3G4Q
Agastache cana	Moderate	G3
Agastache scrophulariifolia	Moderate	G4
Agave neglecta	High	G2G3
Ageratina altissima var. roanensis	Moderate	G5T3T4
Ageratina luciae-brauniae	Moderate	G3
Ageratum littorale	High	G2G3
Agrimonia incisa	Moderate	G3
Aletris bracteata	Very High	G2
Allium allegheniense	High	G3?
Allium canadense var. ecristatum	Moderate	G5T3
Allium elmendorfii	Very High	G2
Allium keeverae	Very High	G2
Allium oxyphilum	Very High	G2
Allium perdulce var. sperryi	Moderate	G4T3
Allium speculae	Very High	G2
Allolepis texana	Very High	G2
Alnus maritima ssp. georgiensis	Very High	G3T1
Alnus maritima ssp. oklahomensis	Very High	G3T2
Amaranthus floridanus	Moderate	G3
Amaranthus pumilus	Very High	G2
Ambrosia cheiranthifolia	Very High	G2
Ambrosia porcheri	Very High	G1
Amelanchier nantucketensis	High	G3Q
Amorpha georgiana var. confusa	Moderate	G3T3
Amorpha georgiana var. georgiana	Very High	G3T2
Amorpha herbacea var. crenulata	Very High	G4T1
Amorpha laevigata	Moderate	G3?
Amorpha nitens	Moderate	G3?
Amorpha ouachitensis	Moderate	G3Q
Amorpha paniculata	Moderate	G3
Amorpha roemeriana	Moderate	G3
Amorpha schwerinii	Moderate	G3G4
Amphianthus pusillus	Very High	G2
Amsonia glaberrima	High	G3Q
Amsonia hubrichtii	Moderate	G3
Amsonia ludoviciana	Moderate	G3
Amsonia tabernaemontana var. gattingeri	Moderate	G5T3Q
Amsonia tharpii	Very High	G1
Andropogon arctatus	Moderate	G3
Andropogon cabanisii	Moderate	G3G4
Andropogon cumulicola	Moderate	G3
Andropogon miamiensis	Very High	G2
Anemia wrightii	Very High	G2?
Anemone edwardsiana var. petraea	Very High	G4T1Q
Anemone quinquefolia var. minima	Moderate	G5T3
Angadenia berteroi	Moderate	G3G4
Angelica dentata	High	G2G3
Anthaenantia texana	Moderate	G3G4
Anulocaulis leiosolenus var. lasianthus	Very High	G4T2
Anulocaulis leiosolenus var. leiosolenus	Moderate	G4T3T4
Anulocaulis reflexus	Very High	G2
Apios priceana	Moderate	G3
Aquilegia canadensis var. australis	Very High	G5T1Q
Aquilegia chrysantha var. chaplinei	Very High	G4T2
Aquilegia chrysantha var. hinckleyana	Very High	G4T1
Aquilegia longissima	High	G3
Arabis georgiana	Very High	G1
Arabis patens	High	G3
Arabis pycnocarpa var. adpressipilis	Moderate	G5T4
Arenaria livermorensis	Very High	G1
Argyrochosma limitanea ssp. limitanea	Moderate	G4G5T3T4
Argythamnia aphoroides	High	G2G3
Argythamnia argyraea	Very High	G2
Aristida mohrii	Very High	G1
Aristida simpliciflora	Moderate	G3G4
Arnoglossum album	Very High	G1
Arnoglossum diversifolium	Very High	G2
Arnoglossum floridanum	Moderate	G3
Arnoglossum muehlenbergii	Moderate	G4
Arnoglossum sulcatum	Moderate	G3
Artemisia ludoviciana ssp. redolens	Moderate	G5T3T4
Asarum rosei	Very High	G1
Asclepias curtissii	Moderate	G3
Asclepias meadii	Very High	G2
Asclepias prostrata	Very High	G1G2
Asclepias uncialis	Very High	G2
Asclepias viridula	Very High	G2
Asimina manasota	Very High	G1
Asimina obovata	Moderate	G3
Asimina tetramera	Very High	G1?
Asplenium abscissum	Moderate	G3G4
Asplenium bradleyi	Moderate	G4
Asplenium heteroresiliens	Very High	G2
Asplenium myriophyllum	Moderate	G3?
Asplenium platyneuron var. bacculum-rubrum	Moderate	G5T2T4Q
Asplenium plenum	Very High	G1Q
Asplenium scolopendrium var. americanum	High	G4T3
Asplenium tutwilerae	Very High	G1
Asplenium verecundum	Very High	G1
Asplenium x biscaynianum	Very High	G1
Asplenium x curtissii	Very High	G1
Astilbe crenatiloba	Very High	GX
Astragalus albulus	Moderate	G3G4
Astragalus bibullatus	Very High	G1
Astragalus crassicarpus var. berlandieri	Moderate	G5T3
Astragalus emoryanus var. terlinguensis	Moderate	G5T3?
Astragalus gypsodes	High	G3
Astragalus lentiginosus var. higginsii	High	G5T1T3Q
Astragalus michauxii	Moderate	G3
Astragalus mollissimus var. coryi	Moderate	G5T3
Astragalus mollissimus var. marcidus	Very High	G5T2
Astragalus obcordatus	Moderate	G3G4
Astragalus praelongus var. ellisiae	Moderate	G4T3T4
Astragalus puniceus var. puniceus	High	G4T3?Q
Astragalus reflexus	Moderate	G3
Astragalus soxmaniorum	Moderate	G3
Astragalus tennesseensis	Moderate	G3
Astragalus waterfallii	Moderate	G3?
Astragalus wrightii	Moderate	G3
Astrolepis windhamii	Moderate	G3?
Astrophytum asterias	Very High	G1G2
Atriplex acanthocarpa ssp. coahuilensis	Moderate	G4T2T4
Atriplex klebergorum	Very High	G2
Atriplex wardii	Moderate	G3
Aureolaria grandiflora var. grandiflora	Very High	G4G5T1?
Aureolaria patula	Moderate	G3
Ayenia euphrasiifolia	Moderate	G3G4
Ayenia limitaris	Very High	G2
Balduina atropurpurea	Very High	G2
Baptisia arachnifera	Very High	G1G2
Baptisia australis var. aberrans	Very High	G5T2
Baptisia australis var. australis	Moderate	G5T3T4
Baptisia bracteata var. laevicaulis	Moderate	G4G5T2T4
Baptisia calycosa var. calycosa	Very High	G3T1
Baptisia calycosa var. villosa	Moderate	G3T3
Baptisia cinerea	Moderate	G3G4
Baptisia lanceolata var. tomentosa	Moderate	G4T3T4
Baptisia megacarpa	Very High	G2
Bartonia texana	High	G2G3
Basiphyllaea corallicola	High	G2G3
Batesimalva violacea	Very High	G1
Bauhinia lunarioides	High	G3
Berberis canadensis	Moderate	G3G4
Betula uber	Very High	G1Q
Bigelowia nuttallii	Moderate	G3G4
Blepharidachne bigelovii	Moderate	G3
Blephilia subnuda	Very High	G1G2
Blephilia woffordii	Very High	G1
Boechera zephyra	Very High	G1
Boerhavia mathisiana	Very High	G2
Bolboschoenus novae-angliae	Moderate	G3
Boltonia apalachicolensis	Very High	G2Q
Boltonia decurrens	High	G2G3
Boltonia montana	Very High	G1G2
Bonamia grandiflora	Moderate	G3
Bonamia ovalifolia	Very High	G1
Bonamia repens	High	G3
Borodinia perstellata	Very High	G2
Borodinia serotina	Very High	G2
Bothriochloa wrightii	High	G3?
Botrychium jenmanii	Moderate	G3G4
Botrychium lunarioides	Moderate	G4?
Botrychium simplex var. simplex	Moderate	G5T3T4

Appendix 2

Bourreria cassinifolia	High	G3?
Bourreria radula	Very High	G2?
Bouteloua kayi	Very High	G1
Bouteloua parryi	Moderate	G3?
Brassia caudata	Moderate	G3G4
Brazoria arenaria	Moderate	G3
Brazoria enquistii	Very High	G2
Brazoria truncata var. pulcherrima	Moderate	G4T3
Brickellia baccharidea	High	G3
Brickellia cordifolia	High	G3
Brickellia dentata	Moderate	G3G4
Brickellia eupatorioides var. floridana	Very High	G5T1
Brickellia eupatorioides var. gracillima	Moderate	G5T3
Brickellia hinckleyi var. hinckleyi	Very High	G2T2
Brickellia hinckleyi var. terlinguensis	Very High	G2TH
Brickellia lemmonii var. lemmonii	Moderate	G4?T3?
Brickellia parvula	High	G3
Bromus arizonicus	Moderate	G3G4
Brongniartia minutifolia	Very High	G2
Buckleya distichophylla	High	G3
Bulbostylis warei	Moderate	G3G4
Caesalpinia brachycarpa	Very High	G2
Caesalpinia pauciflora	Moderate	G2G4
Caesalpinia phyllanthoides	Very High	G2?
Cakile lanceolata ssp. pseudoconstricta	Moderate	G5T2T4
Calamagrostis cainii	Very High	G1
Calamagrostis porteri ssp. insperata	Moderate	G4T3
Calamovilfa arcuata	High	G2G3
Calliandra biflora	Moderate	G3
Calliandra eriophylla var. chamaedrys	Very High	G5T1
Calliandra iselyi	Moderate	G3
Callirhoe bushii	Moderate	G3
Callirhoe scabriuscula	Very High	G2
Callirhoe triangulata	High	G3
Callisia micrantha	Moderate	G3
Calopogon multiflorus	High	G2G3
Calopogon oklahomensis	Very High	G2
Calopogon tuberosus var. simpsonii	Very High	G5T1T2
Calycanthus brockianus	Very High	G1?Q
Calydorea coelestina	High	G2G3
Calystegia catesbeiana ssp. Sericata	Moderate	G3T3
Campanula floridana	Moderate	G3?Q
Campanula reverchonii	Very High	G2
Campanula robinsiae	Very High	G1
Cardamine angustata var. ouachitana	Moderate	G5T3Q
Cardamine clematitis	High	G3
Cardamine longii	High	G3?
Cardamine macrocarpa var. texana	Very High	G3T2
Cardamine micranthera	Very High	G2
Cardiospermum dissectum	Moderate	G3
Carex acidicola	High	G2G3
Carex appalachica	Moderate	G4
Carex austrodeflexa	Moderate	G3G4
Carex baltzellii	Moderate	G3
Carex barrattii	Moderate	G4
Carex biltmoreana	Moderate	G3
Carex bromoides ssp. montana	Moderate	G5T3?
Carex brysonii	Very High	G1
Carex calcifugens	Moderate	G3
Carex chapmanii	Moderate	G3
Carex communis var. amplisquama	Moderate	G5T3
Carex decomposita	Moderate	G3G4
Carex edwardsiana	Moderate	G3G4
Carex fissa var. fissa	Moderate	G4?T3T4
Carex fumosimontana	Very High	G2
Carex godfreyi	Moderate	G3G4
Carex impressinervia	Very High	G2
Carex juniperorum	High	G3
Carex latebracteata	Moderate	G3
Carex lucorum var. austrolucorum	Moderate	G5T3T4
Carex lupuliformis	Moderate	G4
Carex lutea	Very High	G2
Carex manhartii	Moderate	G3G4
Carex mckittrickensis	Very High	G1
Carex misera	Moderate	G3
Carex molestiformis	Moderate	G4
Carex oxylepis var. pubescens	Moderate	G5?T3
Carex paeninsulae	High	G2G3
Carex polymorpha	High	G3
Carex radfordii	Moderate	G3
Carex reniformis	Moderate	G4?
Carex roanensis	High	G3
Carex ruthii	Moderate	G3G4
Carex schweinitzii	Moderate	G3G4
Carex shinnersii	High	G3
Carex socialis	Moderate	G4
Carex thornei	High	G2G3
Carex timida	Moderate	G2G4
Cartrema floridana	Moderate	G3
Castanea dentata	Moderate	G3
Castanea pumila var. ozarkensis	Moderate	G5T3
Castilleja ciliata	Very High	G1Q
Castilleja elongata	Very High	G2Q
Castilleja genevievana	Moderate	G3G4
Castilleja halophila	Very High	G1
Castilleja kraliana	Very High	G2
Castilleja purpurea var. lindheimeri	Moderate	G5T3
Catesbaea parviflora	High	G3?
Cayaponia quinqueloba	Moderate	G4
Ceanothus serpyllifolius	Moderate	G3?Q
Celtis lindheimeri	Moderate	G3Q
Centaurium beyrichii var. glanduliferum	High	G4G5T1T3
Centaurium blumbergianum	Very High	G1
Centrosema arenicola	Very High	G2Q
Ceratophyllum echinatum	Moderate	G4
Chaerophyllum procumbens var. shortii	Moderate	G5T3T4Q
Chaetopappa effusa	Moderate	G3G4
Chaetopappa hersheyi	High	G3
Chaetopappa imberbis	Moderate	G3
Chaetopappa parryi	High	G3
Chamaecrista deeringiana	Moderate	G2G4Q
Chamaecrista fasciculata var. macrosperma	Moderate	G5T3
Chamaecrista horizontalis	Very High	G2
Chamaecrista lineata var. keyensis	Very High	G5T2
Chamaesyce astyla	Very High	G2
Chamaesyce carunculata	Moderate	G3G4
Chamaesyce chaetocalyx var. triligulata	Very High	G5T1
Chamaesyce conferta	Moderate	G3
Chamaesyce cumulicola	Very High	G2
Chamaesyce deltoidea ssp. adhaerens	Very High	G2T1
Chamaesyce deltoidea ssp. deltoidea	Very High	G2T1
Chamaesyce deltoidea ssp. pinetorum	Very High	G2T1
Chamaesyce deltoidea ssp. serpyllum	Very High	G2T1
Chamaesyce garberi	Very High	G1
Chamaesyce geyeri var. wheeleriana	Very High	G5T2
Chamaesyce golondrina	Very High	G2
Chamaesyce jejuna	Very High	G2
Chamaesyce keyensis	Very High	G1Q
Chamaesyce perennans	Moderate	G3
Chamaesyce porteriana var. porteriana	Very High	G2T2
Chamaesyce porteriana var. scoparia	Very High	G2T2
Chamaesyce simulans	Moderate	G3
Chasmanthium nitidum	Moderate	G3G4
Cheilanthes yavapensis	Moderate	G3?
Chelone cuthbertii	Moderate	G3
Chelone lyonii	Moderate	G4
Chelone obliqua var. erwiniae	Moderate	G4T2T4Q
Chelone obliqua var. obliqua	Moderate	G4T3T4Q
Chelone obliqua var. speciosa	Moderate	G4T3
Chenopodium cycloides	Moderate	G3G4
Chenopodium foggii	High	G2G3
Chionanthus pygmaeus	High	G2G3
Chloris texensis	Very High	G2
Chrysopsis delaneyi	Moderate	G3
Chrysopsis floridana	Moderate	G3
Chrysopsis godfreyi	Moderate	G3
Chrysopsis gossypina ssp. cruiseana	Very High	G5T2
Chrysopsis highlandsensis	Very High	G2
Chrysopsis latisquamea	Moderate	G3?
Chrysopsis linearifolia ssp. dressii	Moderate	G4?T3?
Chrysothamnus spathulatus	High	G3
Cicuta maculata var. bolanderi	Moderate	G5T3T4
Cirsium hillii	High	G3
Cirsium horridulum var. vittatum	Moderate	G5T3T4
Cirsium lecontei	Moderate	G3
Cirsium turneri	Moderate	G3
Cirsium virginianum	Moderate	G3
Citharexylum spathulatum	High	G2G3Q
Cladrastis kentukea	Moderate	G4
Claytonia arkansana	Very High	G2
Cleistesiopsis bifaria	Moderate	G3G4
Cleistesiopsis oricamporum	Moderate	G3?
Clematis addisonii	Very High	G1G2
Clematis carrizoensis	Very High	G2
Clematis coactilis	Moderate	G3
Clematis fremontii var. riehlii	Moderate	G5T3Q
Clematis glaucophylla	Moderate	G4?
Clematis morefieldii	Very High	G2
Clematis socialis	Very High	G1
Clematis texensis	Moderate	G3G4
Clematis vinacea	Very High	G2
Clematis viticaulis	Very High	G1
Cleome multicaulis	High	G2G3
Cleomella longipes	Moderate	G3G4
Clinopodium ashei	Moderate	G3
Clinopodium dentatum	Moderate	G3
Clinopodium glabellum	Moderate	G3Q
Clinopodium talladeganum	Very High	G2
Clitoria fragrans	High	G2G3
Coelorachis tuberculosa	Moderate	G3
Collinsonia punctata	Moderate	G3?
Collinsonia tuberosa	Moderate	G3G4
Collinsonia verticillata	Moderate	G3G4
Colubrina cubensis var. floridana	Very High	G2G3T1
Colubrina stricta	Very High	G2
Condalia hookeri var. edwardsiana	Very High	G5T1Q

Appendix 2

Conradina brevifolia	Very High	G2Q
Conradina etonia	Very High	G1
Conradina glabra	Very High	G1
Conradina grandiflora	Moderate	G3
Conradina verticillata	Moderate	G3
Consolea corallicola	Very High	G1
Cooperia jonesii	Moderate	G3Q
Cooperia smallii	Very High	G1G2Q
Cooperia traubii	Moderate	G3
Corallorhiza bentleyi	Very High	G2
Corallorhiza odontorhiza var. pringlei	Moderate	G5T2T4
Coreopsis aristulata	Very High	G1
Coreopsis bakeri	Very High	G1
Coreopsis delphiniifolia	Moderate	G3?
Coreopsis floridana	Moderate	G3G4
Coreopsis grandiflora var. inclinata	Very High	G5T2
Coreopsis integrifolia	Very High	G1G2
Coreopsis intermedia	Moderate	G3
Coreopsis latifolia	Moderate	G3
Coreopsis nudata	Moderate	G3?
Coreopsis palustris	Moderate	G3G4Q
Coreopsis pulchra	Very High	G2
Coreopsis rosea	High	G3
Coryphantha macromeris var. runyonii	High	G5T2T3
Coryphantha nickelsiae	Very High	G2
Coryphantha ramillosa ssp. ramillosa	High	G2G3T2T3
Coryphantha scheeri var. scheeri	Moderate	G4T3
Coryphantha sulcata	Moderate	G3G4
Crataegus aemula	Very High	G2
Crataegus anamesa	Moderate	G3Q
Crataegus ashei	Very High	G2
Crataegus austromontana	Very High	GH
Crataegus brazoria	Moderate	G3Q
Crataegus dallasiana	Moderate	G3Q
Crataegus dispessa	Moderate	G3?
Crataegus fecunda	Very High	GXC
Crataegus flava	Very High	GH
Crataegus harbisonii	Very High	G1
Crataegus harveyana	Very High	G1G2
Crataegus kelloggii	Moderate	G3?
Crataegus lacrimata	Moderate	G3
Crataegus lanuginosa	Very High	GHC
Crataegus latebrosa	Very High	G1G2Q
Crataegus mendosa	Moderate	G3Q
Crataegus nananixonii	Very High	G1
Crataegus ouachitensis	Very High	G2
Crataegus pallens	Very High	G1
Crataegus pennsylvanica	Moderate	G3
Crataegus poliophylla	Moderate	G3Q
Crataegus pruinosa var. magnifolia	Very High	G5T1T2
Crataegus pulcherrima	Moderate	G2G4
Crataegus senta	Very High	G2
Crataegus stenosepala	Moderate	G3Q
Crataegus sutherlandensis	Moderate	G3Q
Crataegus texana	Moderate	G3Q
Crataegus tracyi	Moderate	G3Q
Crataegus triflora	High	G2G3
Crataegus turnerorum	Moderate	G3
Crataegus viburnifolia	Moderate	G3
Crataegus viridis var. glabriuscula	Moderate	G5T3T4
Crataegus warneri	Moderate	G3Q
Cressa nudicaulis	High	G3
Crinum strictum	Moderate	G3Q
Croomia pauciflora	Moderate	G3
Crossopetalum ilicifolium	Moderate	G3
Crotalaria avonensis	Very High	G1
Croton alabamensis var. alabamensis	Moderate	G3T3
Croton alabamensis var. texensis	Very High	G3T2
Croton coryi	Moderate	G3
Croton elliottii	High	G3
Croton glandulosus var. floridanus	Moderate	G5T3
Croton glandulosus var. simpsonii	Moderate	G5T3
Croton pottsii var. thermophilus	Very High	G5T1
Croton suaveolens	High	G3
Cryptantha crassipes	Very High	G1
Cryptantha paysonii	High	G3
Ctenium floridanum	Very High	G2
Cucurbita okeechobeensis	Very High	G1
Cuphea aspera	Very High	G2
Cuscuta attenuata	High	G1G3
Cuscuta exaltata	Moderate	G3
Cuscuta gronovii var. calyptrata	High	G5T1T3
Cuscuta harperi	High	G2G3
Cuscuta indecora var. indecora	Moderate	G5T2T4
Cynanchum blodgettii	Very High	G1G2
Cynanchum northropiae	Moderate	G3G4
Cyperus cephalanthus	High	G3?Q
Cyperus floridanus	Moderate	G3
Cyperus granitophilus	Moderate	G3G4Q
Cyperus grayoides	Moderate	G3G4
Cyperus hystricinus	Moderate	G4
Cyperus onerosus	Very High	G2
Cypripedium kentuckiense	High	G3
Cystopteris utahensis	Moderate	G3?
Dalea adenopoda	High	G2G3
Dalea austrotexana	Very High	G2
Dalea bartonii	Very High	G1
Dalea cahaba	Very High	G2
Dalea carnea var. carnea	Moderate	G5T3T4
Dalea carnea var. gracilis	Moderate	G5T3
Dalea carthagenensis var. floridana	Very High	G5T1
Dalea cylindriceps	High	G3
Dalea foliosa	High	G2G3
Dalea gattingeri	Moderate	G3G4
Dalea hallii	High	G3
Dalea pinnata var. trifoliata	Moderate	G5T3T4
Dalea reverchonii	Very High	G2
Dalea sabinalis	Very High	GH
Dasistoma macrophylla	Moderate	G4
Deeringothamnus pulchellus	Very High	G2
Deeringothamnus rugelii	Very High	G1
Delphinium alabamicum	Moderate	G3
Delphinium carolinianum ssp. calciphilum	Moderate	G5T2T4
Delphinium exaltatum	Moderate	G3
Delphinium newtonianum	Moderate	G3
Delphinium treleasei	Moderate	G3
Dendrophylax lindenii	Very High	G1
Dermatophyllum guadalupense	Very High	G2
Desmanthus reticulatus	Moderate	G3
Desmodium humifusum	Very High	G1G2Q
Desmodium lindheimeri	Moderate	G3G4
Desmodium ochroleucum	High	G2G3
Desmodium paniculatum var. epetiolatum	Very High	G5T1Q
Desmodium tweedyi	Moderate	G3
Dicerandra christmanii	Very High	G1
Dicerandra cornutissima	Very High	G2
Dicerandra densiflora	Moderate	G3?
Dicerandra frutescens	Very High	G1
Dicerandra immaculata var. immaculata	Very High	G1T1
Dicerandra immaculata var. savannarum	Very High	G1T1
Dicerandra modesta	Very High	G1
Dicerandra radfordiana	Very High	G1Q
Dicerandra thinicola	Very High	G1Q
Dichanthelium aciculare ssp. neuranthum	High	G5T3
Dichanthelium appalachiense	Very High	G1
Dichanthelium caerulescens	High	G2G3
Dichanthelium dichotomum var. breve	Moderate	G5T3
Dichanthelium ensifolium ssp. curtifolium	High	G4T3?
Dichanthelium harvillii	Very High	G1
Dichanthelium hirstii	Very High	G1
Dichanthelium malacon	Moderate	G3
Dichanthelium nudicaule	Moderate	G3Q
Diervilla rivularis	Moderate	G3
Digitaria cognata var. arenicola	High	G5T1T3
Digitaria floridana	Very High	G1
Digitaria gracillima	Very High	G1
Digitaria pauciflora	Very High	G1
Digitaria simpsonii	Very High	G2
Dionaea muscipula	Very High	G2
Dioscorea floridana	Moderate	G3G4
Diplachne maritima	Moderate	G3G4
Dirca decipiens	Very High	G1G2
Dirca palustris	Moderate	G4
Dodecatheon frenchii	Moderate	G3?
Draba aprica	Moderate	G3
Draba standleyi	High	G2G3
Drosera tracyi	Moderate	G3G4
Dryopteris celsa	Moderate	G4
Dyschoriste angusta	High	G2G3
Echeandia chandleri	High	G2G3
Echeandia reflexa	Moderate	G2G4
Echeandia texensis	Very High	G1
Echinacea atrorubens	Moderate	G3
Echinacea laevigata	High	G2G3
Echinacea paradoxa var. neglecta	Very High	G3T1
Echinacea paradoxa var. paradoxa	Moderate	G3T3
Echinacea tennesseensis	Very High	G2
Echinocereus chisoensis var. chisoensis	Very High	G2T1
Echinocereus chloranthus var. cylindricus	Moderate	G4T3T4
Echinocereus chloranthus var. neocapillus	Very High	G4T1
Echinocereus chloranthus var. russanthus	High	G4T2T3
Echinocereus coccineus var. gurneyi	Moderate	G5T3T4
Echinocereus coccineus var. paucispinus	Moderate	G5T3
Echinocereus lloydii	Very High	G2Q
Echinocereus milleri	Very High	G1
Echinocereus papillosus var. angusticeps	Very High	G3T1
Echinocereus papillosus var. papillosus	Very High	G3T2?
Echinocereus pectinatus var. wenigeri	Very High	G5T2?
Echinocereus reichenbachii var. albertii	Very High	G5T1Q
Echinocereus reichenbachii var. baileyi	Moderate	G5T3
Echinocereus reichenbachii var. fitchii	Moderate	G5T3
Echinocereus viridiflorus var. canus	Very High	G5T1
Echinocereus viridiflorus var. correllii	Very High	G5T2
Echinocereus viridiflorus var. davisii	Very High	G5T1
Echinochloa paludigena	Moderate	G3Q
Echinodorus floridanus	Very High	G1Q

Appendix 2

Echinodorus parvulus	Moderate	G3Q
Echinomastus intertextus var. dasyacanthus	High	G4T3
Echinomastus intertextus var. intertextus	Moderate	G4T3T4
Echinomastus mariposensis	High	G3
Eleocharis austrotexana	Moderate	G3
Eleocharis bifida	Moderate	G3G4
Eleocharis brachycarpa	Very High	GH
Eleocharis cylindrica	Very High	G1
Eleocharis equisetoides	Moderate	G4
Eleocharis melanocarpa	Moderate	G4
Eleocharis wolfii	Moderate	G3G5
Elliottia racemosa	Very High	G2?
Elymus churchii	Moderate	G3
Elymus diversiglumis	Moderate	G3G4Q
Elymus svensonii	High	G3
Elymus texensis	Very High	G1G2
Elytraria caroliniensis var. angustifolia	Very High	G4T2
Emorya suaveolens	High	G3
Encelia scaposa	High	G3
Ephedra antisyphilitica	Moderate	G3G4
Ephedra coryi	Moderate	G3
Ephedra torreyana var. powelliorum	Very High	G5?T2
Epidendrum floridense	Very High	G2
Epithelantha micromeris var. bokei	Moderate	G4T3
Eragrostis pectinacea var. tracyi	Very High	G5T1
Eragrostis swallenii	Moderate	G3
Ericameria nauseosa var. texensis	High	G5T2T3
Erigeron strigosus var. calcicola	Moderate	G5T3
Erigeron strigosus var. dolomiticola	Very High	G5T2?
Eriocaulon koernickianum	Very High	G2
Eriocaulon nigrobracteatum	Very High	G1
Eriocaulon parkeri	High	G3
Eriocaulon ravenelii	Moderate	G3G4
Eriocaulon texense	Moderate	G4
Eriochloa michauxii var. michauxii	Moderate	G3G4T3T4
Eriochloa michauxii var. simpsonii	Very High	G3G4TH
Eriogonum correllii	High	G2G3
Eriogonum greggii	Very High	G2
Eriogonum hemipterum var. hemipterum	Very High	G3T2
Eriogonum longifolium var. gnaphalifolium	Moderate	G4T3
Eriogonum longifolium var. harperi	Very High	G4T2
Eriogonum nealleyi	Very High	G2
Eriogonum suffruticosum	Very High	G2
Eriogonum tenellum var. ramosissimum	Moderate	G5T3
Ernodea littoralis var. angusta	Very High	G4T2Q
Eryngium aquaticum var. ravenelii	High	G4T2T3
Eryngium arenosum	High	G2G3
Eryngium cuneifolium	Very High	G1
Erythranthe chinatiensis	Very High	G1
Erythronium umbilicatum ssp. monostolum	Moderate	G5T3
Escobaria albicolumnaria	High	G2G3
Escobaria dasyacantha var. chaffeyi	Very High	G3T1
Escobaria dasyacantha var. dasyacantha	Moderate	G3T3
Escobaria dasyacantha var. duncanii	High	G3T2T3
Escobaria guadalupensis	Very High	G1
Escobaria hesteri	Very High	G2
Escobaria minima	Very High	G1
Escobaria missouriensis var. robustior	Moderate	G5T3
Escobaria sneedii var. sneedii	Very High	G2G3QT2Q
Escobaria tuberculosa var. varicolor	Moderate	G4T3?
Euonymus atropurpureus var. cheatumii	Very High	G5THQ
Eupatorium anomalum	High	G2G3
Eupatorium bigelovii	Very High	G2?
Eupatorium frustratum	Very High	G1
Eupatorium lancifolium	Moderate	G3?
Eupatorium maritimum	Very High	G2?
Eupatorium milanioides	Moderate	G3?
Eupatorium paludicola	Very High	G2
Eupatorium recurvans	Moderate	G3G4Q
Eupatorium resinosum	Moderate	G3
Euphorbia georgiana	Very High	G1?
Euphorbia innocua	Moderate	G3
Euphorbia longicruris	Moderate	G3G4
Euphorbia ouachitana	Moderate	G3
Euphorbia peplidion	Moderate	G3
Euphorbia pinetorum	Very High	G2
Euphorbia purpurea	Moderate	G3
Euphorbia rosescens	Very High	G1
Euphorbia strictior	Moderate	G3
Euphorbia telephioides	Very High	G2
Euphorbia trichotoma	High	G2G3
Eurybia avita	Moderate	G3
Eurybia chapmanii	High	G2G3
Eurybia eryngiifolia	Moderate	G3G4
Eurybia furcata	High	G3
Eurybia jonesiae	Moderate	G3?
Eurybia mirabilis	Moderate	G3
Eurybia saxicastellii	Very High	G1G2
Eurybia spinulosa	Very High	G1?
Eurytaenia hinckleyi	Moderate	G3
Eustachys floridana	Very High	G2?
Eustachys neglecta	Moderate	G3
Evolvulus grisebachii	High	G2G3

Eysenhardtia spinosa	Very High	G2
Fendlera rigida	High	G3
Festuca ligulata	Very High	G1
Festuca versuta	Moderate	G3
Fimbristylis brevivaginata	Very High	G2
Fimbristylis perpusilla	Very High	G2
Flaveria floridana	Moderate	G3
Flyriella parryi	Moderate	G3
Forestiera godfreyi	Very High	G2
Forestiera segregata var. pinetorum	Very High	G4T2
Fothergilla gardenii	Moderate	G3G4
Fothergilla major	Moderate	G3
Fothergilla milleri	Very High	G2
Fothergilla parvifolia	Very High	G2
Frankenia johnstonii	Moderate	G3
Franklinia alatamaha	Very High	GXC
Fraxinus papillosa	High	G2G3Q
Fryxellia pygmaea	Very High	G1
Fuirena longa	Moderate	G3G4
Gaillardia aestivalis var. winkleri	Very High	G5T2
Gaillardia multiceps var. microcephala	Very High	G3?T1
Galactia floridana	Moderate	G3G4
Galactia pinetorum	Very High	G2Q
Galactia smallii	Very High	G1Q
Galactia watsoniana	Very High	G1
Galeandra bicarinata	Very High	G1
Galium arkansanum var. pubiflorum	Very High	G5T2
Galium correllii	Very High	G2
Galium fendleri	Moderate	G3G4
Galium obtusum ssp. australe	High	G5T1T3
Galium wrightii	Moderate	G3G4
Gaura boquillensis	High	G3
Gaura macrocarpa	Moderate	G3?
Gaura triangulata	Moderate	G3G4
Gaura villosa ssp. parksii	Moderate	G5T3
Gaylussacia brachycera	Moderate	G3
Gaylussacia orocola	Very High	G1
Genistidium dumosum	Very High	G1
Gentiana alba	Moderate	G4
Gentiana austromontana	Moderate	G3
Gentiana autumnalis	Moderate	G3
Gentiana pennelliana	Moderate	G3
Gentiana saponaria var. latidens	Very High	G5T1T2
Geocarpon minimum	Very High	G2
Geranium lentum	Moderate	G3G4
Geranium wisligeni	Moderate	G3G4
Geum geniculatum	Very High	G2
Geum radiatum	Very High	G2
Gilia insignis	High	G3
Gilia ludens	Moderate	G3
Glandularia maritima	Moderate	G3
Glandularia tampensis	Very High	G2
Glossopetalon texense	Very High	G1
Glyceria nubigena	High	G2G3
Govenia floridana	Very High	GX
Gratiola graniticola	Moderate	G3
Gratiola quartermaniae	Moderate	G3
Greenwoodiella deserticola	Very High	G1
Grindelia oolepis	Very High	G2
Guaiacum sanctum	High	G2G3
Gymnocarpium appalachianum	Moderate	G3
Gymnopogon chapmanianus	Moderate	G3
Hackelia besseyi	High	G2G3
Halophila johnsonii	Very High	G2Q
Hamamelis ovalis	High	G2G3
Harperocallis flava	Very High	G2
Harrisia aboriginum	Very High	G1
Harrisia fragrans	Very High	G1
Harrisia simpsonii	Very High	G2
Hartwrightia floridana	Very High	G2
Hasteola robertiorum	Very High	G1
Hedeoma apiculata	High	G3
Hedeoma costata var. costata	Moderate	G5T3?
Hedeoma mollis	Moderate	G3G4
Hedeoma pilosa	Very High	GH
Hedyotis angulata	Moderate	G3G4
Hedyotis butterwickiae	Very High	G1
Hedyotis nigricans var. austrotexana	Very High	G5T2?
Hedyotis nigricans var. floridana	Very High	G5T2
Hedyotis nigricans var. papillacea	Moderate	G5T3
Hedyotis pooleana	Very High	G1Q
Helenium brevifolium	Moderate	G4
Helenium virginicum	Moderate	G3
Helianthemum arenicola	Moderate	G3
Helianthemum nashii	Moderate	G3G4
Helianthus carnosus	Very High	G1G2
Helianthus debilis ssp. debilis	Moderate	G5T2T4
Helianthus debilis ssp. tardiflorus	Moderate	G5T3
Helianthus debilis ssp. vestitus	Very High	G5T2
Helianthus eggertii	Moderate	G3
Helianthus floridanus	Moderate	G3G4
Helianthus glaucophyllus	Moderate	G3G4
Helianthus longifolius	Moderate	G3

Appendix 2

Helianthus neglectus	Very High	G2Q
Helianthus paradoxus	Very High	G2
Helianthus praecox ssp. hirtus	Very High	G4T2Q
Helianthus praecox ssp. praecox	Very High	G4T2
Helianthus schweinitzii	Moderate	G3
Helianthus smithii	Very High	G2Q
Helianthus verticillatus	Very High	G1
Helonias bullata	High	G3
Hesperaloe parviflora	Moderate	G3
Heteranthera mexicana	High	G2G3
Heteranthera missouriensis	Moderate	G3G4
Heteranthera pauciflora	High	G3
Heuchera alba	Very High	G2Q
Heuchera americana var. hispida	Moderate	G5T3?
Heuchera caroliniana	Moderate	G3
Heuchera parviflora var. puberula	Moderate	G4T3T4
Heuchera parviflora var. saurensis	Very High	G4T1
Heuchera villosa var. arkansana	Moderate	G5T3Q
Hexalectris nitida	Moderate	G3
Hexalectris revoluta var. revoluta	Very High	G2T1T2
Hexalectris spicata var. arizonica	Moderate	G5T2T4
Hexalectris warnockii	High	G2G3
Hexastylis contracta	Moderate	G3
Hexastylis finzelii	Very High	G1
Hexastylis lewisii	Moderate	G3
Hexastylis naniflora	Moderate	G3
Hexastylis rhombiformis	Moderate	G3
Hexastylis rollinsiae	Very High	GHC
Hexastylis shuttleworthii var. harperi	High	G4T3
Hexastylis sorriei	Very High	G1G2
Hexastylis speciosa	Very High	G2
Hibiscus dasycalyx	Very High	G1
Hieracium carneum	Moderate	G3G4
Hieracium scabrum var. intonsum	Moderate	G5T2T4
Hoffmannseggia drummondii	Moderate	G3
Hoffmannseggia tenella	Very High	G1
Hottonia inflata	Moderate	G4
Houstonia correllii	Very High	G1
Houstonia croftiae	Moderate	G3
Houstonia longifolia var. glabra	Moderate	G5T3Q
Houstonia ouachitana	Moderate	G3
Houstonia parviflora	Moderate	G3
Houstonia purpurea var. montana	Very High	G5T2
Hudsonia montana	Very High	G1
Huperzia porophila	Moderate	G4
Hydrastis canadensis	Moderate	G3G4
Hydrophyllum brownei	Very High	G2
Hymenocallis choctawensis	Moderate	G3G4
Hymenocallis coronaria	High	G3?
Hymenocallis duvalensis	Moderate	G3
Hymenocallis gholsonii	Very High	G1
Hymenocallis godfreyi	Very High	G1
Hymenocallis henryae var. glaucifolia	Very High	G2T2
Hymenocallis henryae var. henryae	High	G2T2T3
Hymenocallis palmeri	Moderate	G3?
Hymenocallis punta-gordensis	Very High	G1Q
Hymenocallis pygmaea	Very High	G2Q
Hymenocallis rotata	High	G2G3Q
Hymenopappus biennis	Moderate	G3G4
Hymenopappus carrizoanus	Very High	G2
Hymenophyllum tayloriae	Very High	G2
Hymenoxys perpygmaea	Very High	G1
Hymenoxys texana	Very High	G2
Hymenoxys vaseyi	Very High	G2
Hypericum adpressum	Moderate	G3
Hypericum buckleii	Moderate	G3
Hypericum chapmanii	Moderate	G3
Hypericum cumulicola	Very High	G2
Hypericum edisonianum	High	G2G3
Hypericum erythraeae	Very High	G2
Hypericum exile	High	G2G3
Hypericum graveolens	Moderate	G3
Hypericum harperi	Moderate	G3G4
Hypericum lissophloeus	Very High	G2
Hypericum mitchellianum	Moderate	G3
Hypericum radfordiorum	Very High	G2
Hypoxis sessilis	Moderate	G3
Ilex collina	High	G3
Ilex cuthbertii	Very High	G1
Ilex krugiana	Moderate	G3?
Ilex opaca var. arenicola	Moderate	G5T3T4
Iliamna corei	Very High	G1
Iliamna remota	Very High	G1Q
Illicium parviflorum	Very High	G2
Imperata brevifolia	High	G3
Indigofera miniata var. florida	Moderate	G5T3Q
Indigofera miniata var. texana	Moderate	G5T3Q
Ipomoea costellata var. edwardsensis	Very High	G4T2
Ipomoea macrorhiza	Moderate	G3
Ipomoea microdactyla	Very High	G2
Ipomoea shumardiana	High	G2G3
Ipomoea tenuiloba var. lemmonii	Moderate	G4T3?
Ipomoea tenuissima	High	G3

Ipomopsis havardii	Moderate	G3
Ipomopsis wrightii	High	G2G3
Iris brevicaulis	Moderate	G4
Iris giganticaerulea	Moderate	G3
Iris tridentata	Moderate	G3G4
Isoetes boomii	Very High	G1
Isoetes flaccida var. alata	High	G3T1T3Q
Isoetes flaccida var. chapmanii	High	G3T1T3Q
Isoetes flaccida var. flaccida	High	G3T1T3Q
Isoetes georgiana	High	G2G3
Isoetes graniticola	Very High	G2
Isoetes hyemalis	High	G2G3
Isoetes junciformis	Very High	G1
Isoetes lithophila	Very High	G1
Isoetes louisianensis	High	G2G3
Isoetes melanospora	Very High	G1
Isoetes microvela	Very High	G1
Isoetes mississippiensis	Very High	G1
Isoetes tegetiformans	Very High	G1
Isoetes tennesseensis	Very High	G1
Isoetes virginica	Very High	G1
Isotria medeoloides	High	G2G3
Jacquemontia curtisii	Very High	G2
Jacquemontia reclinata	Very High	G1
Jamesianthus alabamensis	Moderate	G3
Juglans cinerea	Moderate	G3
Juncus caesariensis	High	G2G3
Juncus fascinatus	High	G2G3
Juncus georgianus	Moderate	G3
Juncus longii	Moderate	G3Q
Juncus paludosus	Moderate	G3G4
Juncus trifidus ssp. carolinianus	Moderate	G5T3?Q
Justicia angusta	Moderate	G3Q
Justicia cooleyi	Very High	G2Q
Justicia crassifolia	Moderate	G3
Justicia runyonii	Very High	G2
Justicia warnockii	Moderate	G3
Justicia wrightii	Very High	G2
Kallstroemia perennans	Very High	G1
Kalmia cuneata	Moderate	G3
Kosteletzkya smilacifolia	High	G1G3Q
Krigia montana	Moderate	G3
Krigia wrightii	Moderate	G3G4
Lachnocaulon digynum	Moderate	G3G4
Lachnocaulon engleri	Moderate	G3
Lachnocaulon minus	Moderate	G3G4
Lactuca hirsuta var. albiflora	High	G5T2T3
Laennecia turnerorum	Very High	G1
Lantana depressa var. depressa	Very High	G2T1
Lantana depressa var. floridana	Very High	G2T1
Lantana depressa var. sanibelensis	Very High	G2T1
Leavenworthia alabamica var. alabamica	Very High	G2T2Q
Leavenworthia alabamica var. brachystyla	Very High	G2T1T2Q
Leavenworthia aurea	Very High	G2
Leavenworthia crassa var. crassa	Very High	G2T1Q
Leavenworthia crassa var. elongata	Very High	G2T1Q
Leavenworthia exigua var. exigua	Moderate	G4T3
Leavenworthia exigua var. laciniata	Very High	G4T1T2
Leavenworthia exigua var. lutea	Very High	G4T1
Leavenworthia texana	Very High	G1
Lechea cernua	Moderate	G3
Lechea divaricata	Very High	G2
Lechea lakelae	Very High	GX
Lechea maritima var. virginica	Moderate	G5T3Q
Lechea mensalis	Very High	G1
Leitneria floridana	Moderate	G3
Leitneria pilosa ssp. ozarkana	High	G2G3T2T3
Leitneria pilosa ssp. pilosa	Very High	G2G3T2
Lenophyllum texanum	Moderate	G3
Lepanthopsis melanantha	Moderate	G3G4
Lepidium alyssoides var. angustifolium	High	G5T2T3
Lepidium lasiocarpum var. rotundum	Moderate	G5T3Q
Lepidospartum burgessii	Very High	G2
Leptochloa viscida	Moderate	G3G4
Leptogramma burksiorum	Very High	G1
Lesquerella angustifolia	High	G3
Lesquerella densipila	Moderate	G3
Lesquerella filiformis	Moderate	G3
Lesquerella globosa	Very High	G2
Lesquerella lyrata	Very High	G1
Lesquerella mcvaughiana	Moderate	G3
Lesquerella ovalifolia ssp. alba	Moderate	G5?T3?
Lesquerella pallida	Very High	G1
Lesquerella perforata	Very High	G1
Lesquerella stonensis	Very High	G1
Lesquerella thamnophila	Very High	G1G2
Lesquerella valida	High	G3
Leucosyris blepharophylla	Very High	G1
Leucosyris mattturneri	Very High	G1
Liatris aestivalis	Moderate	G3
Liatris aspera var. salutans	Moderate	G4G5T2T4
Liatris bracteata	High	G2G3
Liatris cokeri	Moderate	G3

Appendix 2

Liatris cymosa	Very High	G2
Liatris elegans var. flabellata	High	G5T1T3Q
Liatris garberi	Moderate	G3
Liatris gholsonii	Very High	G1
Liatris glandulosa	High	G3
Liatris helleri	Very High	G2Q
Liatris microcephala	Moderate	G3G4
Liatris ohlingerae	Very High	G2
Liatris oligocephala	Very High	G1
Liatris patens	Moderate	G3G4
Liatris provincialis	Very High	G2
Liatris savannensis	Moderate	G3G4
Liatris squarrosa var. compacta	Moderate	G5T3
Liatris tenuis	Moderate	G3
Liatris turgida	Moderate	G3
Lilaeopsis carolinensis	Moderate	G3G5
Lilium grayi	Very High	G1G2
Lilium iridollae	Moderate	G3
Lilium pyrophilum	Very High	G2
Limnobium spongia	Moderate	G4
Limonium carolinianum var. angustatum	Very High	G5T1T2Q
Lindera melissifolia	High	G3
Lindera subcoriacea	Moderate	G3
Linum allredii	Very High	G1?
Linum arenicola	Very High	G1G2
Linum carteri var. carteri	Very High	G2T1
Linum carteri var. smallii	Very High	G2T2
Linum floridanum var. chrysocarpum	Moderate	G5T3?
Linum lundellii	Moderate	G3
Linum macrocarpum	Very High	G2
Linum sulcatum var. harperi	Very High	G5T2
Linum westii	Very High	G1G2
Listera australis	Moderate	G4
Lithospermum confine	Moderate	G2G4
Lithospermum decipiens	Very High	G2
Litsea aestivalis	Moderate	G3?
Lobelia apalachicolensis	Moderate	G3
Lobelia batsonii	Moderate	G3
Lobelia boykinii	High	G2G3
Lobelia homophylla	Moderate	G3?
Lomariopsis kunzeana	Moderate	G2G4
Lophophora williamsii	High	G3
Lotus unifoliolatus var. helleri	Moderate	G5T3
Ludwigia brevipes	Very High	G2
Ludwigia curtissii	Moderate	G3G4
Ludwigia lanceolata	Moderate	G3
Ludwigia ravenii	Very High	G1G2
Ludwigia spathulata	Very High	G2
Lupinus westianus var. aridorum	Very High	G3T1
Lupinus westianus var. westianus	Moderate	G3T3
Lycium carolinianum var. carolinianum	Moderate	G4T3?
Lycium carolinianum var. quadrifidum	Moderate	G4T2T4
Lycium puberulum var. berberioides	Moderate	G4T3
Lycium texanum	Very High	G2
Lycopus cokeri	Moderate	G3
Lysimachia asperulifolia	Moderate	G3
Lysimachia fraseri	Moderate	G3
Lysimachia graminea	Very High	G1Q
Lysimachia lewisii	Very High	G2
Lysimachia loomisii	Moderate	G3?
Lythrum curtissii	Very High	G2
Lythrum flagellare	Moderate	G3
Lythrum ovalifolium	Moderate	G3G4
Macbridea alba	Very High	G2
Macbridea caroliniana	High	G2G3
Macranthera flammea	Moderate	G3
Macrosiphonia brachysiphon	Moderate	G3G4
Magnolia acuminata var. subcordata	Moderate	G5T3Q
Magnolia ashei	Moderate	G3
Mahonia swaseyi	Moderate	G3
Malacothrix stebbinsii	High	G3?
Malaxis bayardii	Very High	G1G2
Malaxis wendtii	Very High	G1G2
Malus angustifolia var. puberula	Moderate	G5T2T4
Mammillaria heyderi var. meiacantha	Moderate	G4T3T4
Mammillaria prolifera var. texana	Moderate	G4T3?
Mammillaria wrightii var. wrightii	High	G4T3
Manfreda longiflora	Very High	G2
Manfreda sileri	Moderate	G3
Manfreda virginica ssp. lata	Very High	G5T2Q
Manihot walkerae	Very High	G2
Marshallia grandiflora	Very High	GX
Marshallia legrandii	Very High	G1
Marshallia mohrii	Moderate	G3
Marshallia pulchra	High	G3
Marshallia ramosa	High	G2G3
Marshallia trinervia	Moderate	G3
Matelea alabamensis	Very High	G2
Matelea atrostellata	Very High	G1?
Matelea baldwyniana	Moderate	G3
Matelea brevicoronata	Moderate	G3
Matelea edwardsensis	Moderate	G3
Matelea flavidula	Moderate	G3?
Matelea floridana	Very High	G2
Matelea hirtelliflora	Moderate	G3?
Matelea pubiflora	Moderate	G3G4
Matelea radiata	Very High	G1
Matelea sagittifolia	Moderate	G3
Matelea texensis	Very High	G1
Melanthera ligulata	High	G1G3
Melanthera parvifolia	Very High	G2Q
Mespilus canescens	Very High	G1Q
Micranthemum glomeratum	Moderate	G3?
Micranthemum micranthemoides	Very High	GH
Micranthes careyana	Moderate	G3
Micranthes caroliniana	Moderate	G3
Micranthes petiolaris var. shealyi	Very High	G4G5T1
Mimosa quadrivalvis var. nelsonii	High	G5T1T3
Minuartia cumberlandensis	High	G3
Minuartia godfreyi	Very High	G1
Mirabilis exaltata	Moderate	G3G4Q
Monarda austroappalachiana	Very High	G1
Monarda brevis	Very High	G1G2
Monarda luteola	Very High	G2
Monarda maritima	Very High	G2Q
Monarda punctata var. arlansana	Moderate	G5T3
Monarda viridissima	Moderate	G3
Monotropsis odorata	Moderate	G3
Monotropsis reynoldsiae	Very High	G2
Mortonia sempervirens	Moderate	G3
Muhlenbergia glabriflioris	Moderate	G4?
Muhlenbergia torreyana	High	G3
Muhlenbergia villiflora var. villosa	High	G5T3
Myriophyllum laxum	Moderate	G3
Najas filifolia	High	G3
Narthecium americanum	Very High	G2
Narthecium montanum	Very High	GX
Nemastylis floridana	Very High	G2
Nemastylis nuttallii	Moderate	G3
Nemophila sayersensis	Very High	G2
Nesaea longipes	High	G2G3
Neviusia alabamensis	High	G3
Nissolia platycalyx	High	G3
Nolina arenicola	Very High	G2Q
Nolina atopocarpa	Moderate	G3
Nolina brittoniana	Moderate	G3
Nolina greenei	High	G2G3
Nothoscordum texanum	High	G3?
Nuphar lutea ssp. orbiculata	Moderate	G5T3
Nuphar lutea ssp. sagittifolia	Very High	G5T2
Nuphar lutea ssp. ulvacea	High	G5T2T3
Nymphaea mexicana	Moderate	G3G4
Nyssa ursina	Moderate	G3
Oenothera argillicola	Moderate	G3G4
Oenothera cordata	Moderate	G3
Oenothera coryi	Moderate	G3
Oenothera curtissii	Moderate	G2G4
Oenothera fruticosa var. unguiculata	High	G5T2T3
Oenothera macrocarpa ssp. incana	Moderate	G5T3?
Oenothera macrocarpa ssp. oklahomensis	Moderate	G5T3?
Oenothera pilosella ssp. sessilis	Very High	G5T2
Oenothera riparia	High	G2G3
Okenia hypogaea	High	G3?
Onosmodium helleri	Moderate	G3
Onosmodium molle ssp. bejariense	Moderate	G4G5T3
Onosmodium molle ssp. molle	Moderate	G4G5T3
Opuntia aggeria	Moderate	G3G4
Opuntia arenaria	Very High	G2
Opuntia aureispina	Very High	G1
Opuntia chisosensis	Moderate	G2G4
Opuntia densispina	Very High	G1Q
Opuntia engelmannii var. flexospina	Very High	G5T1Q
Opuntia imbricata var. argentea	Very High	G5T1
Opuntia kunzei	Moderate	G3G4
Opuntia macrocentra var. macrocentra	Moderate	G3G4T3T4
Opuntia parishii	Moderate	G3G4
Opuntia phaeacantha var. camanchica	Moderate	G5T3T4
Opuntia spinosibacca	High	G3Q
Opuntia triacantha	Moderate	G2G4
Opuntia valida	Moderate	G3
Orbexilum lupinellum	Moderate	G3G4
Orbexilum macrophyllum	Very High	GX
Orbexilum stipulatum	Very High	GX
Orbexilum virgatum	Very High	G1
Osmorhiza mexicana ssp. bipatriata	Very High	G5T1
Ostrya chisosensis	Very High	G2
Oxalis alpina	Moderate	G3G4
Oxalis macrantha	Moderate	G2G4
Oxypolis canbyi	Very High	G2
Oxypolis greenmanii	Moderate	G3
Oxypolis ternata	Moderate	G3
Packera crawfordii	Very High	G2
Packera hartiana	Moderate	G3G4
Packera millefolia	High	G3
Packera serpenticola	Very High	G1
Packera texensis	Very High	G2

Appendix 2

Palafoxia hookeriana var. hookeriana	Moderate	G4T3T4
Palafoxia integrifolia	Moderate	G3G4
Panax quinquefolius	Moderate	G3G4
Panicum abscissum	Moderate	G3
Panicum lithophilum	High	G2G3Q
Parietaria praetermissa	Moderate	G3G4
Parnassia asarifolia	Moderate	G4
Parnassia caroliniana	High	G3
Parnassia grandifolia	Moderate	G3
Paronychia americana ssp. americana	Moderate	G3G4T3T4
Paronychia chartacea ssp. chartacea	Moderate	G3T3
Paronychia chartacea ssp. minima	Very High	G3T1
Paronychia congesta	Very High	G1
Paronychia erecta var. corymbosa	Moderate	G3G4T2T4
Paronychia herniarioides	Moderate	G2G4
Paronychia jonesii	Moderate	G3G4
Paronychia lundelliorum	Very High	G1Q
Paronychia maccartii	Very High	GH
Paronychia patula	Moderate	G3G4
Paronychia rugelii var. interior	Very High	G2?T2?Q
Paronychia rugelii var. rugelii	Very High	G2?T2?
Paronychia virginica var. virginica	Very High	G4T1Q
Paronychia wilkinsonii	High	G2G3
Parthenium auriculatum	Moderate	G3G4
Parthenium integrifolium var. mabryanum	Moderate	G5T3
Paspalum dissectum	Moderate	G4?
Paspalum laxum	Moderate	G3G4
Passiflora pallens	Moderate	G3G4
Paxistima canbyi	Very High	G2?
Pectis linearifolia	Moderate	G3G4
Pediomelum cyphocalyx	Moderate	G3G4
Pediomelum digitatum var. parvifolium	Moderate	G5T3
Pediomelum humile	Very High	G1
Pediomelum pentaphyllum	Very High	G1G2
Pediomelum piedmontanum	Very High	G1
Pediomelum reverchonii	Moderate	G3
Pellaea glabella ssp. missouriensis	Very High	G5T1T2
Pellaea ternifolia ssp. arizonica	Moderate	G5T2T4
Peltandra sagittifolia	Moderate	G3G4
Peniocereus greggii var. greggii	High	G3G4T3
Penstemon alamosensis	High	G3
Penstemon ambiguus var. laevissimus	Moderate	G4G5T2T4
Penstemon cardinalis ssp. regalis	High	G3T2T3
Penstemon dissectus	Very High	G2
Penstemon guadalupensis	Moderate	G3
Penstemon kralii	Very High	G2
Penstemon oklahomensis	Moderate	G3
Penstemon ramosus	Moderate	G3G4Q
Penstemon smallii	Moderate	G3
Penstemon triflorus ssp. integrifolius	Very High	G3T2
Penstemon triflorus ssp. triflorus	Moderate	G3T3
Penstemon wrightii	Moderate	G3G4
Perideridia americana	Moderate	G4
Perityle aglossa	Moderate	G3G4
Perityle angustifolia	Moderate	G3G4
Perityle bisetosa var. appressa	Very High	G2T2
Perityle bisetosa var. bisetosa	Very High	G2T2
Perityle bisetosa var. scalaris	Very High	G2T1
Perityle cinerea	Very High	G2
Perityle dissecta	Very High	G2
Perityle fosteri	Very High	G1
Perityle huecoensis	Very High	G1
Perityle lindheimeri var. halimifolia	Moderate	G4T3Q
Perityle lindheimeri var. lindheimeri	Moderate	G4T3T4
Perityle rupestris var. albiflora	Moderate	G4T3
Perityle rupestris var. rupestris	Moderate	G4T3
Perityle vitreomontana	Very High	G1
Perityle warnockii	Very High	G1
Persea humilis	Moderate	G3
Phacelia covillei	Moderate	G3
Phacelia dubia var. georgiana	Moderate	G5T3
Phacelia dubia var. interior	Moderate	G5T3T4
Phacelia dubia var. rionensis	Moderate	G5T3
Phacelia maculata	Moderate	G3G4
Phacelia pallida	Very High	G2
Phacelia petiolata	Very High	G2
Phaseolus polystachios var. sinuatus	Moderate	G5T3?
Phaseolus texensis	Very High	G2
Phemeranthus calcaricus	Moderate	G3
Phemeranthus mengesii	Moderate	G3
Phemeranthus piedmontanus	Very High	G1
Phemeranthus rugospermus	Moderate	G3G4
Philadelphus crinitus	Very High	G2Q
Philadelphus floridus	Very High	G1Q
Philadelphus sharpianus	High	G1G3Q
Philadelphus texensis var. ernestii	Moderate	G3T3
Philadelphus texensis var. texensis	Very High	G3T2
Phlox bifida ssp. stellaria	Moderate	G5?T3
Phlox buckleyi	High	G2G3
Phlox drummondii ssp. johnstonii	Moderate	G5T3
Phlox floridana	Moderate	G3
Phlox longipilosa	Very High	G1
Phlox nivalis ssp. texensis	Very High	G4T2

Phlox oklahomensis	Moderate	G3
Phlox pilosa ssp. deamii	Moderate	G5T3T4
Phlox pulchra	Very High	G1
Phoebanthus grandiflorus	Moderate	G3G4
Phoebanthus tenuifolius	Moderate	G3
Phoradendron hawksworthii	Moderate	G3
Phyla stoechadifolia	Moderate	G3G4
Phyllanthopsis arida	Very High	G2Q
Phyllanthus abnormis var. riograndensis	Moderate	G5T3
Phyllanthus ericoides	Very High	G2
Phyllanthus liebmannianus ssp. platylepis	Very High	G4T2
Phyllanthus pentaphyllus var. floridanus	Very High	G4T2
Physalis angustifolia	Moderate	G3G4
Physalis arenicola	Moderate	G3?
Physalis carpenteri	Moderate	G3
Physalis lanceolata	Moderate	G3
Physalis macrosperma	Moderate	G3G4
Physalis missouriensis	Very High	G2
Physostegia correllii	Very High	G2
Physostegia godfreyi	Moderate	G3
Physostegia longisepala	High	G2G3
Pilea pumila var. deamii	Moderate	G5T2T4
Piloblephis rigida	Moderate	G3G4
Pilosocereus robinii var. deeringii	Very High	G1T1Q
Pilosocereus robinii var. robinii	Very High	G1T1Q
Pinaropappus parvus	Moderate	G3
Pinguicula ionantha	Very High	G2
Pinguicula planifolia	Moderate	G3?
Pinguicula primuliflora	Moderate	G3G4
Pinguicula pumila	Moderate	G4
Pinus arizonica var. stormiae	High	G4T3
Pisonia rotundata	High	G1G3
Pityopsis flexuosa	Moderate	G3
Pityopsis oligantha	Very High	G2?
Pityopsis ruthii	Very High	G1
Plantago cordata	Moderate	G4
Plantago sparsiflora	Moderate	G3
Platanthera blephariglottis var. conspicua	Moderate	G5T4
Platanthera chapmanii	Very High	G2
Platanthera flava var. flava	Moderate	G4?T4?Q
Platanthera flava var. herbiola	Moderate	G4?T4Q
Platanthera integra	Moderate	G3G4
Platanthera integrilabia	High	G2G3
Platanthera leucophaea	High	G2G3
Platanthera nivea	Moderate	G3G4
Platanthera praeclara	High	G3
Platanthera shriveri	Very High	G1
Pluchea longifolia	Moderate	G3G4
Poa paludigena	Moderate	G3G4
Poa strictiramea	High	G3
Polanisia dodecandra ssp. riograndensis	Moderate	G5T3
Polanisia erosa ssp. breviglandulosa	Moderate	G5T3T4
Polemonium pauciflorum ssp. hinckleyi	Very High	G3G5T2Q
Polemonium reptans var. villosum	Moderate	G5T3T4
Polemonium vanbruntiae	Moderate	G3G4
Polygala boykinii var. sparsifolia	Very High	G4T2Q
Polygala hookeri	Moderate	G3
Polygala leptostachys	Moderate	G3G4
Polygala lewtonii	Very High	G2
Polygala lindheimeri var. parvifolia	Moderate	G4T3T4
Polygala maravillasensis	Very High	G2
Polygala palmeri	High	G3
Polygala rimulicola var. rimulicola	High	G3T3
Polygala setacea	Moderate	G3G4
Polygala smallii	Very High	G1
Polygonella basiramia	Moderate	G3
Polygonella macrophylla	Moderate	G3
Polygonella myriophylla	Moderate	G3
Polygonella parksii	Very High	G2
Polygonum glaucum	Moderate	G3
Polygonum hirsutum	Moderate	G3G4
Polymnia cossatotensis	Very High	G1
Polymnia johnbeckii	Very High	G1
Polymnia laevigata	Moderate	G3
Ponthieva brittoniae	Moderate	G2G4
Portulaca biloba	Very High	G1G2
Portulaca minuta	Very High	G2
Portulaca smallii	Moderate	G3
Portulaca umbraticola ssp. coronata	Very High	G5T2
Potamogeton clystocarpus	Very High	G1
Potamogeton floridanus	Very High	G1
Potamogeton hillii	High	G3
Potamogeton tennesseensis	High	G2G3
Prenanthes aspera	Moderate	G4?
Prenanthes barbata	Moderate	G3
Prenanthes carrii	Very High	G2
Prenanthes roanensis	Moderate	G3
Proboscidea sabulosa	High	G3
Proboscidea spicata	Very High	GH
Prosthechea cochleata var. triandra	Very High	G4G5T2
Prunus geniculata	Moderate	G3
Prunus havardii	Moderate	G3
Prunus minutiflora	Moderate	G3G4

Appendix 2

Prunus murrayana	Very High	G2
Prunus serotina var. eximia	Moderate	G5T2T4
Prunus texana	Moderate	G3G4
Pseudoclappia arenaria	Moderate	G3
Pseudoclappia watsonii	Very High	G1
Pseudognaphalium arizonicum	Moderate	G3G4
Pseudognaphalium austrotexanum	Moderate	G3
Pseudognaphalium helleri ssp. helleri	Moderate	G4G5T3T4
Pseudognaphalium helleri ssp. micradenium	Moderate	G4G5T3?
Psidium longipes	Moderate	G3G4
Psilactis heterocarpa	High	G2G3
Ptelea trifoliata var. persicifolia	Moderate	G5T2T4
Pteroglossaspis ecristata	High	G2G3
Ptilimnium ahlesii	Very High	G1
Ptilimnium costatum	Moderate	G4
Ptilimnium nodosum	Very High	G2
Puccinellia parishii	High	G2G3
Pycnanthemum beadlei	High	G2G3
Pycnanthemum clinopodioides	Very High	G1G2
Pycnanthemum curvipes	High	G3
Pycnanthemum floridanum	Moderate	G3
Pycnanthemum torrei	Very High	G2
Pyxidanthera brevifolia	High	G3
Quercus acerifolia	Very High	G1
Quercus arkansana	Moderate	G3
Quercus boyntonii	Very High	G1
Quercus carmenensis	Very High	G2?
Quercus depressipes	High	G3
Quercus georgiana	Moderate	G3
Quercus graciliformis	Very High	G1
Quercus hinckleyi	Very High	G2
Quercus oglethorpensis	Moderate	G3
Quercus robusta	Very High	G1Q
Quercus tardifolia	Very High	G1
Rayjacksonia aurea	Very High	G1
Reimarochloa oligostachya	Moderate	G3G4
Reynosia septentrionalis	Moderate	G3G4
Rhexia aristosa	Moderate	G3G4
Rhexia parviflora	High	G2G3
Rhexia salicifolia	Moderate	G3
Rhododendron austrinum	Moderate	G3
Rhododendron chapmanii	Very High	G1
Rhododendron colemanii	Moderate	G3
Rhododendron eastmanii	High	G3
Rhododendron flammeum	Moderate	G3
Rhododendron prunifolium	Moderate	G3
Rhododendron smokianum	High	G2G3
Rhododendron vaseyi	Moderate	G3
Rhododon angulatus	Very High	G1Q
Rhododon ciliatus	Moderate	G3
Rhus michauxii	High	G2G3
Rhynchosia michauxii	Moderate	G3?
Rhynchosia swartzii	High	G3
Rhynchospora cephalantha var. attenuata	Moderate	G5T3?
Rhynchospora crinipes	Moderate	G3
Rhynchospora culixa	Very High	G1Q
Rhynchospora decurrens	Moderate	G3G4
Rhynchospora fernaldii	Moderate	G3G4
Rhynchospora floridensis	High	G3
Rhynchospora galeana	Moderate	G3?
Rhynchospora globularis var. pinetorum	Moderate	G5T3T4
Rhynchospora harperi	Moderate	G4?
Rhynchospora harveyi	Moderate	G4
Rhynchospora indianolensis	Moderate	G3Q
Rhynchospora leptocarpa	Moderate	G3
Rhynchospora macra	Moderate	G3G4
Rhynchospora megaplumosa	Very High	G2
Rhynchospora pallida	Moderate	G3
Rhynchospora pineticola	Moderate	G3?Q
Rhynchospora pleiantha	High	G2G3
Rhynchospora punctata	Very High	G1?
Rhynchospora saxicola	Moderate	G3Q
Rhynchospora scirpoides	Moderate	G4
Rhynchospora solitaria	Very High	G1
Rhynchospora stenophylla	Moderate	G4
Rhynchospora stiletto	Very High	G2
Rhynchospora sulcata	Moderate	G2G4Q
Rhynchospora thornei	High	G3
Ribes curvatum	Moderate	G4
Ribes echinellum	Very High	G1
Ripariosida hermaphrodita	Moderate	G3
Robinia hispida var. fertilis	Very High	G4T1T2
Robinia hispida var. kelseyi	Very High	G4T1
Robinia hispida var. rosea	Moderate	G4T3?
Robinia viscosa var. hartwegii	Very High	G3T2
Robinia viscosa var. viscosa	Moderate	G3T3
Rorippa aquatica	Moderate	G4?
Rorippa floridana	Moderate	G3G4
Rorippa ramosa	Very High	G2
Rosa stellata var. erlansoniae	Very High	G4T1
Roystonea elata	High	G2G3
Rubus boyntonii	Moderate	G3?Q
Rubus clarus	Very High	G2?Q
Rubus concameratus	Very High	GHQ
Rubus curtipes	Very High	G2?Q
Rubus defectionis	Very High	G1?Q
Rubus densissimus	Very High	G1
Rubus flavinanus	High	G3?Q
Rubus fryei	Very High	GHQ
Rubus grimesii	Moderate	G3G4Q
Rubus hancinianus	Very High	G2
Rubus harmonicus	Very High	G2?Q
Rubus huttonii	Very High	GHQ
Rubus hypolasius	Very High	G1?Q
Rubus impar	Very High	G1G2
Rubus inferior	Very High	G2?Q
Rubus iniens	Very High	G2?Q
Rubus kelloggii	Very High	G1?Q
Rubus largus	Very High	G2?
Rubus mirus	Moderate	G3?
Rubus nefrens	Very High	G1Q
Rubus nessianus	Moderate	G3Q
Rubus originalis	High	G3?
Rubus ostryifolius	Moderate	G3?Q
Rubus pascuus	Moderate	G2G4
Rubus prestonensis	High	G3
Rubus probativus	Moderate	G3?
Rubus racemiger	Very High	G2?Q
Rubus rosarius	Moderate	G3?
Rubus sewardianus	Very High	G2?Q
Rubus trux	Moderate	G3G4
Rubus velox	Very High	G2?Q
Rubus vigilis	Moderate	G3?Q
Rubus whartoniae	Very High	G2Q
Rudbeckia auriculata	Very High	G2
Rudbeckia graminifolia	Moderate	G3
Rudbeckia heliopsidis	Very High	G2
Rudbeckia laciniata var. humilis	Moderate	G5T3?
Rudbeckia nitida	Moderate	G3
Rudbeckia scabrifolia	Moderate	G3G4
Rudbeckia triloba var. pinnatiloba	Moderate	G5T3
Rudbeckia triloba var. rupestris	Moderate	G5T3?
Ruellia caroliniensis var. succulenta	Very High	G5T1T2
Ruellia humilis var. depauperata	Moderate	G5T3T4Q
Ruellia noctiflora	High	G3?
Ruellia pedunculata ssp. pinetorum	Moderate	G5T3T4
Ruellia purshiana	Moderate	G3
Rugelia nudicaulis	Moderate	G3
Sabatia arkansana	Very High	G1
Sabatia brevifolia	Moderate	G3G4
Sabatia capitata	Very High	G2
Sabatia grandiflora	Moderate	G3G4
Sabatia kennedyana	Moderate	G3G4
Sachsia polycephala	Very High	G2
Sageretia minutiflora	Moderate	G3G4
Sagittaria ambigua	Very High	G2?
Sagittaria chapmanii	Moderate	G3?
Sagittaria fasciculata	Very High	G2
Sagittaria isoetiformis	Moderate	G3
Sagittaria macrocarpa	Very High	G2
Sagittaria secundifolia	Very High	G1
Sagittaria weatherbiana	Moderate	G3G4
Salix floridana	High	G2G3
Salvia arizonica	Moderate	G3G4
Salvia penstemonoides	Very High	G1
Salvia summa	High	G3
Sapium caribaeum	Moderate	G3?
Sarracenia alabamensis ssp. alabamensis	Very High	G3T1T2
Sarracenia alabamensis ssp. wherryi	Moderate	G3T3
Sarracenia jonesii	Very High	G2
Sarracenia leucophylla	Moderate	G3
Sarracenia minor var. okefenokeensis	High	G4T2T3
Sarracenia oreophila	Very High	G2
Sarracenia purpurea var. montana	Very High	G5T1T2
Sarracenia rosea	Moderate	G3
Sarracenia rubra ssp. gulfensis	High	G3G4T2T3
Sarracenia rubra ssp. rubra	Moderate	G3G4T3T4
Sarracenia rubra ssp. viatorum	High	G3G4T2T3Q
Schisandra glabra	Moderate	G3
Schizachyrium maritimum	Moderate	G3G4Q
Schizachyrium niveum	Very High	G1G2
Schizachyrium sericatum	Very High	G1Q
Schizachyrium spadiceum	High	G3?
Schizachyrium stoloniferum var. stoloniferum	Moderate	G3G4QT2T4
Schoenocaulon dubium	Moderate	G3?
Schoenolirion albiflorum	Moderate	G3
Schoenolirion wrightii	Moderate	G3
Schoenoplectiella hallii	High	G3
Schoenoplectus deltarum	Moderate	G3G4
Schoenoplectus etuberculatus	Moderate	G3G4
Schwalbea americana	Very High	G2
Scirpus ancistrochaetus	High	G3
Scirpus divaricatus	Moderate	G4
Scirpus flaccidifolius	Very High	G2
Scleria bellii	High	G2G3
Sclerocactus brevihamatus ssp. brevihamatus	Moderate	G4T3

Appendix 2

Sclerocactus brevihamatus ssp. tobuschii	Moderate	G4T3
Scutellaria alabamensis	Very High	G2
Scutellaria altamaha	High	G2G3
Scutellaria arenicola	Moderate	G3G4
Scutellaria bushii	Moderate	G3
Scutellaria floridana	Very High	G2
Scutellaria glabriuscula	Very High	G2
Scutellaria havanensis	Moderate	G3G4
Scutellaria laevis	Very High	G1
Scutellaria mellichampii	Moderate	G3
Scutellaria ocmulgee	Very High	G2
Scutellaria parvula var. missouriensis	Moderate	G4T4
Scutellaria pseudoserrata	Moderate	G3
Scutellaria saxatilis	Moderate	G3G4
Scutellaria thieretii	Very High	G2Q
Sedum havardii	Very High	G2
Sedum nevii	Moderate	G3
Sedum pusillum	Moderate	G3
Sedum robertsianum	Very High	G1Q
Selaginella armata	Moderate	G3G4
Selaginella eatonii	High	G2G3
Selaginella ludoviciana	Moderate	G3G4
Selaginella tortipila	Moderate	G3
Selaginella viridissima	Very High	G2
Selenia grandis	Moderate	G3
Selenia jonesii	Moderate	G3
Selinocarpus maloneanus	Very High	G1
Senecio quaylei	Very High	G1Q
Senecio warnockii	Moderate	G3Q
Senna orcuttii	Very High	G2
Senna ripleyana	Very High	G1
Sesuvium trianthemoides	Very High	GH
Seymeria texana	Moderate	G3
Shortia brevistyla	Very High	G2
Shortia galacifolia	High	G2G3
Sibara grisea	High	G3
Sicyos glaber	High	G3
Sida inflexa	Very High	G1Q
Sidalcea neomexicana ssp. thurberi	Moderate	G4T3T4
Sideroxylon alachuense	Very High	G1
Sideroxylon macrocarpum	Moderate	G3Q
Sideroxylon reclinatum ssp. austrofloridense	Moderate	G4G5T3
Sideroxylon reclinatum ssp. rufotomentosum	Moderate	G4G5T3
Sideroxylon tenax	Moderate	G3?
Sideroxylon thornei	High	G3
Silene caroliniana ssp. wherryi	Moderate	G5T2T4Q
Silene ovata	Moderate	G3
Silene plankii	Very High	G2
Silene polypetala	Very High	G2
Silene regia	Moderate	G3
Silene subciliata	Moderate	G3
Silene virginica var. robusta	High	G5T2T3
Silphium brachiatum	Moderate	G3
Silphium compositum var. venosum	Moderate	G5T3T4
Silphium glutinosum	Very High	G2
Silphium mohrii	Moderate	G3?Q
Silphium perfoliatum var. connatum	Moderate	G5T3T4
Silphium perplexum	Very High	G1
Silphium pinnatifidum	Moderate	G3Q
Silphium reverchonii	High	G1G3Q
Silphium simpsonii	Moderate	G3?Q
Silphium terebinthinaceum var. luciae-brauniae	Moderate	G4G5T3?Q
Silphium wasiotense	High	G3
Siphonoglossa longiflora	Moderate	G2G4
Sisyrinchium calciphilum	Very High	G1G2
Sisyrinchium capillare	Moderate	G3
Sisyrinchium dichotomum	Very High	G2
Sisyrinchium xerophyllum	Moderate	G3
Smilax leptanthera	Very High	GHQ
Smilax renifolia	Moderate	G3
Solanum carolinense var. hirsutum	Very High	G5T1
Solanum davisense	High	G3
Solanum leptosepalum	Very High	G1G2
Solidago albopilosa	Very High	G2
Solidago arenicola	High	G2G3
Solidago arguta var. neurolepis	High	G5T1T3Q
Solidago auriculata	Moderate	G4
Solidago austrocaroliniana	Very High	GH
Solidago brachyphylla	Moderate	G3G4
Solidago correllii	Moderate	G3
Solidago faucibus	Moderate	G2G4
Solidago gattingeri	Moderate	G3?Q
Solidago georgiana	Very High	G1?
Solidago glomerata	Moderate	G3
Solidago kralii	High	G2G3
Solidago lancifolia	Very High	G2
Solidago leavenworthii	Moderate	G3G4
Solidago mollis var. angustata	Moderate	G5T3
Solidago ouachitensis	Moderate	G3
Solidago plumosa	Very High	G1
Solidago porteri	Very High	G1
Solidago pulchra	Moderate	G3
Solidago radula var. laeta	Moderate	G5?T2T4Q
Solidago radula var. stenolepis	High	G5?T1T3
Solidago shortii	Very High	G1
Solidago simplex var. racemosa	Moderate	G5T3?
Solidago simulans	Very High	G2
Solidago spithamaea	Very High	G2
Solidago verna	Moderate	G3
Solidago villosicarpa	Very High	G1
Sorghastrum apalachicolense	Moderate	G3G4Q
Spermacoce terminalis	Moderate	G2G4
Sphenopholis filiformis	Moderate	G4
Spigelia alabamensis	Very High	G2
Spigelia gentianoides	Very High	G2
Spigelia loganioides	Very High	G2
Spigelia texana	Moderate	G3
Spiraea virginiana	Very High	G2?
Spiranthes bightensis	Very High	G1
Spiranthes brevilabris	Very High	G1G2
Spiranthes confusa	Moderate	G2G4
Spiranthes eatonii	Moderate	G3Q
Spiranthes floridana	Very High	G1
Spiranthes igniorchis	Very High	G1?
Spiranthes lanceolata var. paludicola	Very High	G4T1
Spiranthes longilabris	Moderate	G3
Spiranthes lucida	Moderate	G4
Spiranthes magnicamporum	Moderate	G3G4
Spiranthes ovalis var. ovalis	Moderate	G5T3T4
Spiranthes parksii	Moderate	G3
Sporobolus curtissii	Moderate	G3
Sporobolus floridanus	Moderate	G3
Sporobolus pinetorum	Moderate	G3
Sporobolus teretifolius	Very High	G2
Sporobolus tharpii	Moderate	G3
Stachydeoma graveolens	High	G2G3
Stachys alabamica	Very High	G1
Stachys appalachiana	Very High	G1G2
Stachys caroliniana	Very High	G1
Stachys clingmanii	Very High	G2
Stachys eplingii	Very High	G1G2
Stachys glandulosissima	Very High	G1
Stachys hyssopifolia var. lythroides	Very High	G5T1Q
Stachys iltisii	Moderate	G3
Stachys matthewsii	Very High	G1G2
Stachys nelsonii	Very High	G1
Stanleya pinnata var. texana	Very High	G5T1
Stellaria fontinalis	Moderate	G3
Stenandrium dulce var. floridanum	Very High	G3G5T1T2Q
Stenanthium diffusum	Very High	G1
Stenanthium gramineum var. robustum	High	G4G5T3
Stenanthium leimanthoides	Very High	G2
Stenanthium tennesseense	Very High	G2
Stenanthium texanum	Moderate	G3
Stewartia malacodendron	Moderate	G4
Stillingia sylvatica ssp. tenuis	Very High	G5T2Q
Stipulicida setacea var. lacerata	Moderate	G4G5T3T4
Streptanthus bracteatus	Very High	G1
Streptanthus carinatus ssp. carinatus	Moderate	G4T3T4
Streptanthus cutleri	Very High	G2
Streptanthus maculatus ssp. maculatus	High	G3T2T3Q
Streptanthus maculatus ssp. obtusifolius	Moderate	G3T3Q
Streptanthus platycarpus	Moderate	G3
Streptanthus sparsiflorus	Very High	G2Q
Streptanthus squamiformis	High	G2G3
Stuckenia striata	Moderate	G3G4Q
Stylisma abdita	Moderate	G3
Stylisma aquatica	Moderate	G4
Stylisma pickeringii var. pickeringii	Moderate	G4T3
Stylosanthes calcicola	Moderate	G3G4
Styrax platanifolius ssp. platanifolius	Moderate	G3T3
Styrax platanifolius ssp. stellatus	Moderate	G3T3
Styrax platanifolius ssp. texanus	Very High	G3T1
Styrax platanifolius ssp. youngiae	Very High	G3T1
Suaeda duripes	Very High	GHQ
Swietenia mahagoni	Moderate	G3G4
Symphoricarpos guadalupensis	Very High	GHQ
Symphyotrichum bracei	Moderate	G3G4
Symphyotrichum concolor var. devestitum	Very High	G5T2
Symphyotrichum depauperatum	Very High	G2
Symphyotrichum drummondii var. texanum	Moderate	G5T3T4
Symphyotrichum estesii	Very High	G1
Symphyotrichum fontinale	Moderate	G2G4
Symphyotrichum georgianum	Moderate	G3
Symphyotrichum plumosum	Very High	G2
Symphyotrichum pratense	Moderate	G4?
Symphyotrichum puniceum var. scabricaule	Very High	G5T2
Symphyotrichum rhiannon	Very High	G1
Synandra hispidula	Moderate	G4
Taenidia montana	Moderate	G3
Tauschia texana	Moderate	G3
Taxus floridana	Very High	G2
Tectaria coriandrifolia	Moderate	G2G4
Tephrosia angustissima var. angustissima	Very High	G1TX
Tephrosia angustissima var. corallicola	Very High	G1T1
Tephrosia angustissima var. curtissii	Very High	G1T1

Appendix 2

Tephrosia mohrii	Moderate	G3
Tephrosia rugelii	Moderate	G3G4
Terminalia molinetii	Moderate	G3G4
Tetraneuris turneri	Moderate	G3
Teucrium cubense var. densum	Moderate	G4G5T3T4
Thalia dealbata	Moderate	G4
Thalictrum arkansanum	Very High	G2Q
Thalictrum cooleyi	Very High	G1
Thalictrum debile	High	G2G3
Thalictrum macrostylum	Moderate	G3G4
Thalictrum texanum	Very High	G2Q
Thaspium pinnatifidum	High	G2G3
Thelesperma burridgeanum	Moderate	G3
Thelesperma curvicarpum	Moderate	G3
Thelocactus bicolor var. flavidispinus	Very High	G4T2
Thelypodiopsis shinnersii	High	G2G3
Thelypodium tenue	Very High	G1Q
Thelypodium texanum	Moderate	G3
Thelypodium wrightii ssp. oklahomense	Very High	G4G5T2?
Thelypteris ovata var. ovata	Moderate	G3G5T3T4
Thermopsis fraxinifolia	Moderate	G3?
Thermopsis mollis	Moderate	G3G4
Thermopsis villosa	Moderate	G3?
Thurovia triflora	High	G2G3
Thymophylla tephroleuca	Very High	G2
Tidestromia carnosa	High	G3
Tillandsia baileyi	High	G2G3
Tolumnia bahamensis	High	G3
Torreya taxifolia	Very High	G1
Tradescantia buckleyi	Moderate	G3
Tradescantia ernestiana	Moderate	G3G4Q
Tradescantia leiandra var. glandulosa	Very High	G4T1?Q
Tradescantia ozarkana	Moderate	G3
Tradescantia pedicellata	Very High	G2Q
Tragia nigricans	Moderate	G3
Tragia saxicola	Very High	G2
Trautvetteria fonticalcarea	Very High	G2?
Triadenum tubulosum	Moderate	G4?
Trichocoronis rivularis	High	G2G3
Trichocoronis wrightii var. wrightii	High	G4T3
Trichomanes boschianum	Moderate	G4
Trichomanes petersii	Moderate	G4
Trichomanes punctatum ssp. floridanum	Very High	G4G5T1
Trichostema nesophilum	Very High	G2
Trichostema suffrutescens	Very High	G1G2
Tridens buckleyanus	Moderate	G3G4
Tridens carolinianus	Moderate	G3G4
Tridens flavus var. chapmanii	Moderate	G5T3
Trifolium calcaricum	Very High	G1
Trifolium kentuckiense	Very High	G1
Trifolium mucronatum ssp. lacerum	Moderate	G3G5T3
Trifolium reflexum	Moderate	G3G4
Trifolium stoloniferum	Moderate	G3
Trifolium virginicum	Moderate	G3
Trillium decipiens	Moderate	G3G4
Trillium delicatum	Very High	G1
Trillium discolor	Moderate	G3
Trillium foetidissimum	Moderate	G3
Trillium georgianum	Very High	G1
Trillium gracile	High	G2G3
Trillium lancifolium	Moderate	G3
Trillium oostingii	Very High	G1
Trillium persistens	Very High	G1
Trillium pusillum var. monticulum	Very High	G4T2
Trillium pusillum var. ozarkanum	Moderate	G4T3
Trillium pusillum var. pusillum	High	G4T3
Trillium pusillum var. virginianum	High	G4T3
Trillium reliquum	Moderate	G3
Trillium simile	Moderate	G3
Trillium tennesseense	Very High	G1
Trillium texanum	Moderate	G3
Trillium vaseyi	Moderate	G3
Trillium viride	Moderate	G3G4
Triphora craigheadii	Very High	G1
Triphora trianthophora var. texensis	Very High	G4?T1Q
Triphora yucatanensis	Very High	G1
Tripsacum floridanum	Very High	G2
Tsuga caroliniana	High	G2G3
Utricularia olivacea	Moderate	G4
Utricularia resupinata	Moderate	G4
Uvularia floridana	Moderate	G3
Uvularia puberula var. nitida	Moderate	G5T3
Vaccinium crassifolium ssp. sempervirens	Very High	G4G5T1
Valeriana texana	Very High	G2
Valerianella florifera	Moderate	G3
Valerianella nuttallii	High	G3
Valerianella ozarkana	Moderate	G3
Valerianella palmeri	Moderate	G3
Valerianella stenocarpa	Moderate	G3
Valerianella texana	Very High	G2
Vanilla dilloniana	Moderate	G3G4
Vanilla mexicana	Moderate	G2G4
Vaseyochloa multinervosa	Moderate	G3
Verbena cloverae	Moderate	G3
Verbena plicata var. degeneri	Moderate	G5T3Q
Verbesina chapmanii	Moderate	G3
Verbesina heterophylla	Very High	G2
Verbesina walteri	Moderate	G4
Vernonia angustifolia ssp. scaberrima	Moderate	G5T2T4
Vernonia lettermannii	Moderate	G3
Vernonia pulchella	Moderate	G3
Veronicastrum virginicum	Moderate	G4
Viburnum bracteatum	Moderate	G3
Vicia floridana	Moderate	G3G4
Vicia ocalensis	Very High	G2
Viola calcicola	Moderate	G3
Viola guadalupensis	Very High	G1
Viola tripartita var. glaberrima	Moderate	G5T3?
Viola tripartita var. tripartita	Moderate	G5T3
Vitis rupestris	Moderate	G3
Waldsteinia lobata	Moderate	G3
Warea amplexifolia	Very High	G1
Warea carteri	Very High	G1
Warea cuneifolia	Moderate	G3
Warea sessilifolia	Moderate	G2G4
Willkommia texana var. texana	Moderate	G3G4T3
Wissadula parvifolia	Very High	G1
Woodsia appalachiana	Moderate	G4
Woodsia obtusa ssp. occidentalis	Moderate	G5T3T4
Woodsia phillipsii	Moderate	G2G4
Xanthisma blephariphyllum	Moderate	G3G4
Xanthisma viscidum	High	G3
Xerophyllum asphodeloides	Moderate	G4
Xylorhiza wrightii	Moderate	G3
Xyris chapmanii	Moderate	G3
Xyris correlliorum	Very High	G1
Xyris drummondii	Moderate	G3G4
Xyris isoetifolia	Very High	G2
Xyris longisepala	High	G2G3
Xyris louisianica	High	G2G3
Xyris panacea	Very High	G1
Xyris scabrifolia	Moderate	G3
Xyris serotina	Moderate	G3G4
Xyris spathifolia	Very High	G1
Xyris tennesseensis	Very High	G2
Yeatesia platystegia	Moderate	G3G4
Yucca cernua	Very High	G1
Yucca necopina	Very High	G1G2
Yucca pallida	Moderate	G3G4
Yucca reverchonii	Moderate	G3
Yucca tenuistyla	Moderate	G3
Yucca thompsoniana	Moderate	G3G4
Zamia integrifolia	Moderate	G3G4Q
Zanthoxylum coriaceum	High	G3
Zanthoxylum flavum	High	G3
Zanthoxylum parvum	Very High	G2
Zephyranthes refugiensis	High	G2G3
Zephyranthes simpsonii	High	G2G3
Zigadenus leimanthoides	Moderate	G4Q
Zizania texana	Very High	G1
Ziziphus celata	Very High	G1

Appendix 3

Partner Institution Summaries

Southeastern Plant Conservation Alliance

A cross-cutting partnership of public and private conservation professionals working in the Southeastern United States, the SE PCA is revolutionary - it brings together regional plant experts from different states, agencies and institutions. It provides a forum where they share information on the conservation status and needs of imperiled plants throughout the region, without being limited by state or agency boundaries. The SE PCA seeks to bridge gaps between local and national efforts by fostering regional cooperation and promoting a diversity of partners. It is tailored to multiple interests to provide training opportunities, fill information gaps, identify needs, prioritize efforts, and work collaboratively to conserve imperiled plants.

Atlanta Botanical Garden Southeastern Center for Conservation

The Atlanta Botanical Garden has more than 30 years of experience in the conservation and recovery of rare and threatened plant species through research, propagation, collaborative restoration and habitat management. Through its Southeastern Center for Conservation & Research, the Atlanta Botanical Garden advances the science of conservation through research, collaborations, and native species recovery programs that include conservation collections at the garden and applied conservation activities that support preservation of species in their native habitats. Conservation programs, training, and capacity building derived from the activities of the Southeastern Center for Conservation support the Garden's commitment to serving the needs of the community and making the connection between people and plants. Through conservation of imperiled species and natural communities across the Southeastern U.S., Caribbean, and Ecuador, the center protects the natural heritage of one of North America's most biodiverse regions.

NatureServe

For nearly 50 years, NatureServe has been the authoritative source for biodiversity data throughout the Americas. To protect threatened biodiversity, NatureServe works with nearly 100 organizations and over 1,000 conservation scientists to collect, analyze, and deliver standardized biodiversity information, providing comprehensive spatial data to meet both regulatory and conservation needs. NatureServe and its network partners develop and manage data for over 100,000 species and ecosystems, answering fundamental questions about what exists, where it is found, and how it is doing.

NatureServe Network

More than 60 NatureServe Network Programs collect and analyze data about the plants, animals, and ecological communities of the Western Hemisphere. In the Southeastern United States, member programs consist of Natural Heritage Programs or Nongame and Rare Species Programs. These are housed in government or academic institutions. They are the leading source of information on the precise locations and conditions of at-risk species and threatened ecosystems in their jurisdictions. NatureServe collects, curates, and distributes that information for use at regional, national, and international scales. Staff throughout the Network are experts in their fields, and include some of the most knowledgeable field biologists and conservation planners in their regions.

Southeast Association of Fish & Wildlife Agencies Wildlife Diversity Committee

The Wildlife Diversity Committee is responsible for advising the SEAFWA Directors and making recommendations on issues and matters regarding nongame and endangered species, both terrestrial and aquatic, which may affect the ability of member states to fulfill their fish and wildlife management responsibilities. This Committee is the primary committee to work with other wildlife diversity and nongame and endangered species entities and programs, such as Partners-In-Flight.

Terwilliger Consulting, Inc.

Terwilliger Consulting, Inc. brings its breadth of expertise and extensive conservation network to inform and engage stakeholders together and accomplish challenging natural resource projects. TCI uses the natural energy of the issue and the group to forge new and positive, powerful processes and outcomes. TCI's experience spans a diverse array of conservation plan and program development and implementation. Most notably it has supported the 2005, 2015 and now 2025 State Wildlife Action Plans produced by the 13 Northeast states (and Washington D.C.), the 13 Midwest States, the 15 Southeast states, and several western states to advance local, state, regional, and national priority species of greatest conservation need and their habitats amidst the most daunting threats they face to determine and implement conservation actions inclusively and effectively.

Flora of the Southeastern of the United States

The Flora of the Southeastern United States (FSUS) is a database of flora compiled and updated by Alan Weakley, director of the UNC Herbarium, since 1992. The geographic extent of the FSUS covers the entire flora of 17 states with portions of eight other states and includes descriptions and keys for almost 11,000 vascular plant taxa in the most recent 2022 update. Since its first digital inception and availability as an open-source document, thousands of both domestic and international users have downloaded the Flora, across private, state, and federal agencies and among a variety of naturalists and nature enthusiasts. It has been cited in its various drafts by hundreds of publications and still serves as the most inclusive, updated floristic resource for the entire southeastern United States.

Southeast Climate Adaptation Science Center

The Southeast Climate Adaptation Science Center is part of a network of nine Climate Adaptation Science Centers managed by the U.S. Geological Survey National Climate Adaptation Science Center. Our mission is to deliver science to help fish, wildlife, water, land, and people adapt to a changing climate. North Carolina State University is the host institution for the Southeast Climate Adaptation Science Center, providing organizational leadership to implement the CASC mission through capacity building, project management,

communications, partnership development, and connections with scientific capabilities in the region. The mission is implemented through collaborative partnerships among USGS, natural and cultural resource management organizations, and academic institutions.

Planning Team Member Bios

Emily Coffey, Ph.D.
Dr. Emily E. D. Coffey is VP of Conservation and Research at the Atlanta Botanical Garden. Coffey joined the Garden in 2017 to lead the Conservation and Research Department where she leads and collaborates with a team of conservation scientists and horticulturists to expand the activities in conservation research, propagating and growing rare plants, and developing regional and international conservation initiatives for plants and ecosystems. She received a B.S. (Hons) in Biology from University of Missouri – St. Louis, a M.S. with Distinction in Biodiversity, Conservation, and Management from University of Oxford – UK, and Ph.D. in long-term ecology and conservation biology from the University of Oxford –UK at The Biodiversity Institute. She conducted her Post-Doctoral work at University of Oxford in The Biodiversity Institute. Before joining ABG, she was a faculty member of Biology at the University of North Carolina Asheville. Dr. Coffey has broad botanical knowledge and experience with ex situ and in situ conservation, restoration ecology, community ecology, and biogeography. She is familiar with ecological processes and flora of many geographical settings including Appalachian Mountain Fens/Bogs, Caribbean islands, Missouri sandstone glades, Canary Island laurel forests, and Galápagos Islands. In the latter, she examined ecological baseline conditions for the humid highlands of Santa Cruz Island in order to distinguish temporal vegetation transitions, identify potential drivers of the transitions, and evaluate their importance for conservation and management practices. Findings from her research have been published in numerous journals including Science, Ecology, and Journal of Biogeography. Research conducted at UNCA included identifying historical fire regime patterns across the Appalachian Mountain bog/fen habitats aimed at providing land managers a framework for restoring fire as an ecological process. Additional, current appointments include Research Professor at the University of North Carolina - Asheville and Adjunct Assistant Professor at Georgia Technical Institute, Atlanta.

Carrie Radcliffe, M.Sc.
Carrie Radcliffe earned her B.S. and M.S. at the University of Georgia studying conservation horticulture and plant biology while conducting research on the floral morphology, reproductive biology, and micropropagation of Georgia Plume (*Elliottia racemosa*). She has been with the Conservation & Research Department of Atlanta Botanical Garden since 2012, managing collaborative habitat restoration projects and a database of *ex situ* and *in situ* and safeguarding activities on behalf of the Garden's Southeastern Center for Conservation and the Georgia Plant Conservation Alliance. Carrie serves as the Mountain Bog Safeguarding Coordinator for GPCA and the Chair for Southern Appalachian Bog Learning Network. She coordinated the 2016 & 2020 Southeastern Partners in Plant Conservation conferences, is Coordinator for the Southeastern Plant Conservation Alliance, and was named Conservation Partnerships Manager in 2022. In this capacity she continues developing partnerships that support rare and culturally significant plants while promoting the network for stewardship of habitats and species in the Southeast. Carrie lives in the Southern Blue Ridge mountains, serves as a leader and environmental educator for local Scout groups, is an avid outdoorswoman, and is passionate about inspiring the next generation of conservation leaders & scientists.

Sarah Norris, M.Sc.
Sarah received her B.S. in Animal Science from Berry College and her M.S. in Environmental Science from Florida Gulf Coast University where she published research on the effects of mercury on neonatal and juvenile blacktip sharks (*Carcharhinus limbatus*). With a background in community ecology, environmental science, and conservation, Sarah uses her experience facilitating conservation activities to serve as the Conservation Partnerships Assistant for Atlanta Botanical Garden and the Southeastern Plant Conservation Alliance (SE PCA). This role leverages her experience with academic and research program coordination to support the SE PCA and the development of the first Regional Species of Greatest Conservation Need list for imperiled plants. Sarah also supports other grant funded and general activities of the SE PCA, as well as the SE Center for Conservation at ABG.

Amanda Eberly, M.Sc.
Amanda Eberly is a Research Botanist with NatureServe, where she is responsible for regular reviews of the conservation status of North American plants and is fluent with the NatureServe ranking methodology and IUCN Red Listing. She develops and delivers training on NatureServe methodology and works on data development, including taxonomic updates. She has a M.S. degree in Plant Science from Delaware State University where she studied the taxonomy of beak sedges (Rhynchospora, Cyperaceae). She began her botanical career as an intern and later a seasonal ecologist with Pennsylvania Natural Heritage Program. Amanda was a coauthor on Mistaken Identity?, a guide to distinguishing invasive and native plant species. Amanda has extensive experience with the flora of the Mid-Atlantic and Southeastern United States. In the off hours, she enjoys studying the local flora of her hometown in Frederick County, Maryland.

Wes Knapp, M.Sc.
Wesley Knapp is the Chief Botanist at NatureServe, a leading biodiversity conservation non-profit in the United States. NatureServe leverages the power of science, data, and technology to guide biodiversity conservation and stewardship. Wes has over 20 years of experience working in the NatureServe Network as a Botanist and Ecologist with both the Maryland and North Carolina Natural Heritage Programs. He has extensive field experience across much of the United States with additional fieldwork experience in Australia, Canada, and Central America. His research includes the first examination of the extinct plants of the United States and Canada, new plant species discoveries, and treatments of plant groups in various Floras and Manuals. He has also published two books including, Vascular Plants of Maryland, USA: A Comprehensive Account of the State's Botanical Diversity which is freely available through the Smithsonian Scholarly Press. His research interests include identifying and preventing plant extinction events, describing undescribed plant species, systematics, ecology, and taxonomy. He has a B.S. from Catawba College, a M.S. from Delaware State University, and is currently a Ph.D. student at the University of North Carolina at Chapel Hill in Alan Weakley's lab. His work has been featured in New York Times, the Washington Post, and the PBS NewsHour.

Jon Ambrose, Ph.D.
As Chief of the Wildlife Conservation Section of Georgia DNR, Jon's primary duties include statewide coordination of research and resource management projects, budget and personnel management, and implementation of the State Wildlife Action Plan. He also oversees environmental education and outreach, conservation planning, land protection, and development of funding sources for nongame wildlife conservation. Jon coordinated the development of Georgia's State Wildlife Action Plan in 2005 as well as its 2015 revision. He currently serves on the AFWA Climate Change Adaptation and Threatened and Endangered Species Policy committees as well as the SEAFWA Wildlife Diversity Committee. He also serves on the Leadership Team for the Southeastern Plant Conservation Alliance and as Georgia DNR point of contact for the Southeast Conservation Adaptation Strategy (SECAS) and the Piedmont-South Atlantic Coast Cooperative Ecosystem Studies Unit. Jon participated as an advisor and subject matter expert for a previous SEAFWA RSGCN project focused on high priority animals. He has a B.A. in Biology and M.S. in Ecology from the University of Tennessee and a Ph.D. in Ecology from the University of Georgia.

Karen Terwilliger, M.Sc.
Karen Terwilliger is a fish and wildlife diversity consultant, a natural resource planner and facilitator. Karen founded Terwilliger Consulting Inc. 25 years ago where she works with both public and private sectors in most states and regions to advance biodiversity conservation through inclusive planning and engagement. Previously she coordinated Virginia's Wildlife Diversity program and served as a Virginia Department of Wildlife Resources Board member. She has worked with several federal agencies, including the US Fish and Wildlife Service, US Forest Service, and the US Geological Survey, as well as several non-governmental organizations including The Nature Conservancy, the National Wildlife Federation and land trusts. Her national work includes threatened and endangered species recovery teams, The Wildlife Society committees, and her international work includes NATO and other programs for a healthy, sustainable world. Karen holds a B.S. and M.S. in Wildlife Biology.

Tracy Rice, M.Sc.
Tracy is an ecologist and conservation planner with expertise in State Wildlife Action Plans, natural resource management, endangered and threatened species management, and coastal policy. She has worked with TCI for 20 years, including projects to develop and manage fish and wildlife Regional Species of Greatest Conservation Need in the Northeast, Southeast, and Midwest regions and to develop conservation and management plans for several National Wildlife Refuges, National Parks and Seashores, and military installations. Tracy previously worked for the US Fish and Wildlife Service and holds a B.A. from Wittenberg University and a M.S.in Coastal Geology from Duke University.

Alan Weakley, Ph.D.
Alan Weakley is a plant taxonomist, community ecologist, and conservationist specializing in the Southeastern United States. He holds a B.A. from UNC-Chapel Hill and a Ph.D. from Duke University. He has worked as botanist and ecologist for the N.C. Natural Heritage Program, and as regional and chief ecologist for The Nature Conservancy and NatureServe. He has worked cooperatively with most federal and state land-managing agencies in the southeastern U.S. He is currently Director of the UNC Herbarium, a department of the N.C. Botanical Garden, and teaches as adjunct faculty at UNC-Chapel Hill and at the Highlands Biological Station. Alan is author of the Flora of the Southeastern United States and its app version, FloraQuest, and co-author of the Flora of Virginia and the Flora of Virginia App, which have received awards including the Thomas Jefferson Award for Conservation. He is also co-author of Wildflowers of the Atlantic Southeast. He has also released an app, FloraQuest, which he co-developed for the Southeastern United States flora. He has authored over 100 journal articles and book chapters, and is in high demand as a speaker on plant taxonomy, community classification and mapping, biogeography, and biodiversity conservation. He is active with the Flora of North America project and the United States National Vegetation Classification, serves as an advisor to the N.C. Natural Heritage Program and N.C. Plant Conservation Program, and is a co-founder of the Carolina Vegetation Survey.

Scott Ward, M.Sc.
Scott Ward is a research botanist at NCBG working for the Flora of the Southeastern United States team and its associated PDF publications, as well as web and phone applications. Scott is originally from western New York, where he worked on a variety of community ecology projects, including vegetation sampling for the Great Lakes Coastal Wetland Monitoring Program as part of the Great Lakes Restoration Initiative. In addition to this research, Scott also assisted in multiple community sampling projects, many incorporating the interplay between invasive and native plant community interactions. Namely, his thesis focused on community and disturbance metrics across Celastrus scandens and C. orbiculatus populations, as well as other non-native liana invasions. He obtained both his B.S. and M.S. from SUNY Brockport, in part drawing from liana research stated above to complete the latter degree. He now works as a Research Botanist at N.C. Botanical Garden and UNC-CH Herbarium, and also teaches specialized botanical courses at the garden and beyond.

Jennifer Cartwright, Ph.D.
Dr. Jennifer Cartwright is an ecologist with a background in GIS and hydrology and a focus on supporting effective natural-resource management. Her research has concerned climate-change impacts on a variety of terrestrial, wetland, and freshwater ecosystems across North America. Jen has overseen studies of forest drought impacts on local-to-regional scales, modeling of wetland ecohydrology leveraging remote sensing and field observations, identification of refugia from climate change, and assessments of climate impacts to at-risk ecosystems and species. She has been affiliated with the USGS Lower Mississippi-Gulf Water Science Center since 2009 and received her Ph.D. in Biology from Tennessee State University in 2014.

Alex Loomis, Ph.D.
Dr. Alex Loomis is a conservation ecologist focused on work at the interface of science and resource management to support effective conservation. Alex has a background in quantitative population ecology and GIS. His previous experience has largely been focused on his home ecosystems in Hawaii. He received his PhD in Biology from Duke University in 2022, performing research focused on Hawaiian plants and ecosystems, using demographic modeling to assess the impacts of climate and biotic threats on native rare plant populations. Alex also has extensive experience working with and for plant conservation agencies in Hawaii. He also serves as a member of the IUCN Hawaiian Islands Plants Specialist group and Conservation Planning Specialist group, and as a trustee and the secretary for the Friends of the Honolulu Botanical Gardens.

Appendix 4

RSGCN Planning Team Participants

Name	Organization
Alan Weakley	University of North Carolina
Amanda Treher	NatureServe
Carrie Radcliffe	Southeastern Plant Conservation Alliance/Atlanta Botanical Garden
Emily Coffey	Atlanta Botanical Garden
Jon Ambrose	Georgia Department of Natural Resources
Karen Terwilliger	Terwilliger Consulting, Inc.
Misty Nelson	NatureServe
Sarah Norris	Southeastern Plant Conservation Alliance/Atlanta Botanical Garden
Tracy Monegan Rice	Terwilliger Consulting, Inc.
Wesley Knapp	NatureServe

RSGCN Technical Team Participants

Name	State	Organization
Amy Jenkins	Florida	Florida Natural Areas Inventory
Brenda Wichmann	North Carolina	North Carolina Natural Heritage Program
Bruce Hoagland	Oklahoma	Oklahoma Natural Heritage Inventory
Chris Doffitt	Louisiana	Louisiana Department of Wildlife and Fisheries
Heather Sullivan	Mississippi	Mississippi Natural Heritage Program
Jason Singhurst	Texas	Texas Parks and Wildlife Department
Joanne Baggs	Southeast	US Forest Service
John Burkhart	West Virginia	West Virginia Natural Heritage Program
John Townsend	Virginia	Virginia Natural Heritage Program
Keith Bradley	South Carolina	South Carolina Department of Natural Resources
Lauren Trotta	Florida	The Institute for Regional Conservation
Lisa Kruse	Georgia	Georgia Department of Natural Resources
Malissa Briggler	Missouri	Missouri Department of Conservation
Susan Fruchey	North Carolina	US Forest Service - Pisgah National Forest
Todd Crabtree	Tennessee	Tennessee Natural Heritage Program

RSGCN Survey Team Participants

Name	State	Organization
Al Schotz	Alabama	Alabama Natural Heritage Program
Amy Jenkins	Florida	Florida Natural Areas Inventory
Anna Strong	Texas	Texas Parks and Wildlife Department
Brenda Wichmann	North Carolina	North Carolina Natural Heritage Program
Brian Streets	West Virginia	West Virginia Natural Heritage Program
Bruce Hoagland	Oklahoma	Oklahoma Natural Heritage Inventory
Caitlin Elam	Tennessee	Tennessee Division of Natural Areas
Carlee Steppe	Georgia	Georgia Department of Natural Resources
Chris Doffitt	Louisiana	Louisiana Department of Wildlife and Fisheries
David Lincicome	Tennessee	Tennessee Natural Heritage Program
Devin Rodgers	Kentucky	Kentucky Energy and Environment Cabinet
Elizabeth Raikes	Kentucky	US Forest Service - Land Between the Lakes
Gary Kauffman	North Carolina	US Forest Service - NC National Forest
Gemma Milly	Georgia	Georgia Department of Natural Resources
Hanna Rosner-Katz	Florida	Florida Natural Areas Inventory
Heather Sullivan	Mississippi	Mississippi Natural Heritage Program
Jim Vanderhorst	West Virginia	West Virginia Natural Heritage Program
John Burkhart	West Virginia	West Virginia Natural Heritage Program
Keith Bradley	South Carolina	South Carolina Department of Natural Resources
Lesley Starke	North Carolina	North Carolina Plant Conservation Program
Lisa Kruse	Georgia	Georgia Department of Natural Resources
Malissa Briggler	Missouri	Missouri Department of Conservation
Mark Howery	Oklahoma	Oklahoma Department of Wildlife Conservation
Mark Pistrang	Tennessee	US Forest Service - Cherokee National Forest
Mincy Moffett	Georgia	US Fish & Wildlife Service - Georgia Field Office
Samantha Tessel	South Carolina	South Carolina Department of Natural Resources
Scott Wiggers	Mississippi	US Fish & Wildlife Service - MS Field Office
Stephanie Koontz	Georgia	Georgia DNR Wildlife Resources Division
Tara Littlefield	Kentucky	Office of Kentucky Nature Preserves
Todd Crabtree	Tennessee	Tennessee Natural Heritage Program

RSGCN Ranking Workshop Participants

Al Schotz	Alabama Natural Heritage Program
Amanda Eberly	NatureServe
Amy Jenkins	Florida Natural Areas Inventory
Brenda Wichmann	North Carolina Natural Heritage Program
Bruce Hoagland	Oklahoma Natural Heritage Inventory
Carlee Steppe	Georgia Department of Natural Resources
Carrie Radcliffe	Southeastern Plant Conservation Alliance
Diana Soteropoulos	Arkansas Natural Heritage Commission Herbarium
Emily Coffey	Atlanta Botanical Garden
Gemma Milly	Georgia Department of Natural Resources
Jon Ambrose	Georgia Department of Natural Resources
Jonathan Gore	Atlanta Botanical Garden
Keith Bradley	South Carolina Department of Natural Resources
Lisa Kruse	Georgia Department of Natural Resources
Maria Vogel	Atlanta Botanical Garden
Samantha Tessel	South Carolina Department of Natural Resources
Sarah Norris	Southeastern Plant Conservation Alliance
Stephanie Koontz	GA DNR Wildlife Resources Division
Wesley Knapp	NatureServe
Alan Weakley	University of North Carolina
Chris Doffitt	LA Dept of Wildlife and Fisheries
Hanna Rosner-Katz	Florida Natural Areas Inventory
Jason Singhurst	Texas Parks and Wildlife Department
John Burkhart	West Virginia Natural Heritage Program
John F. Townsend (Johnny)	Virginia DCR - Division of Natural Heritage
Malissa Briggler	Missouri Department of Conservation
Theo Witsell	Arkansas Natural Heritage Commission
Todd Crabtree	Tennessee Natural Heritage Program

On the cover: An at-risk plant from each of the SEAFWA Region states included in the RSGCN list. All individual images credited. Image collage created by Sarah Norris.

Alabama - Georgia rockcress (*Arabis georgiana;* open access, no photograper given)
Arkansas - Rose gentian (*Sabatia arkansana*; Eric Hunt)
Florida - American chaffseed (*Schwalbea americana*; Flickr: dogtooth77)
Georgia - Georgia aster (*Symphyotrichum georgianum*; Michelle Elmore)
Kentucky - Canby's mountain-lover (*Paxistima canbyi*; Michael Kesl)
Louisiana - False dragonhead (*Physostegia virginiana*; open access, no photographer given)
Mississippi - Apalachicola doll's daisy (*Boltonia apalachicolensis*; Plant Delights Nursery, Inc.)
Missouri - Oklahoma grass-pink (*Calopogon oklahomensis*; Central Louisiana Orchid Society)
North Carolina - Gray's lily (*Lilium grayi*; Flickr: BlueRidgeKitties)
Oklahoma - Longleaf phlox (*Phlox longifolia*; Thayne Tuason)
South Carolina - Bunched arrowhead (*Sagittaria fasciculata*; Flickr: Gary Peeples/U.S Fish and Wildlife Service)
Tennessee - Spreading avens (*Geum radiatum*; Flickr: BlueRidgeKitties)
Texas - Chapman's fringed orchid (*Platanthera chapmanii*; Matt Berger)
Virginia - Shriver's frilly orchid (*Platanthera shriveri*; Flickr: NC Orchid)
West Virginia - Bentley's coralroot (*Corallorhiza bentleyi*; Flickr: NC Orchid)