











TENNESSEE STATE WILDLIFE ACTION PLAN 2015

TENNESSEE WILDLIFE RESOURCES AGENCY

Tennessee State Wildlife Action Plan 2015

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The mission of the Tennessee Wildlife Resources Agency is to preserve, conserve, protect, and enhance the fish and wildlife of the state and their habitats for the use, benefit, and enjoyment of the citizens of Tennessee and its visitors. The Agency will foster the safe use of the state's waters through a program of law enforcement, education, and access.

In keeping with this mission, the Agency recognizes its long-standing partnership with sportsmen and the significant contributions that sportsmen have made and continue to make to benefit all fish and wildlife, including non-game species. In submitting this State Wildlife Action Plan, the Agency expresses its intent that implementation of this plan be conducted in a way to achieve the Agency's mission, while sustaining and promoting hunting and fishing in Tennessee.

The Nature Conservancy is the largest nonprofit conservation organization in the world and works collaboratively with individuals & communities, governments, nonprofits and companies across the globe. The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.

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Executive Summary

Since 2001, when Congress first funded the State and Tribal Wildlife Grants Program (SWG Program), states have been required to develop comprehensive plans to guide the conservation of nongame species. The SWG Program addresses important wildlife issues that have traditionally been underfunded, and it is now the nation's core program for preventing endangered species listings. To receive funds, each state and territory is required to develop a "Comprehensive Wildlife Conservation Strategy," popularly known as a State Wildlife Action Plan or SWAP. At a minimum, SWAPs must be updated every 10 years. This report represents the first revision of Tennessee's SWAP, originally issued in 2005. This revision has 7 chapters, outlined below, organized along the lines of the "8 Required Elements" that must be addressed in all SWAPs according to Congressional mandate.

The TN-SWAP was developed based upon two key assumptions: (1) that although the focus is conservation of nongame wildlife species, many nongame conservation strategies and actions are habitat based and therefore benefit a wide range of species, including those that are common or hunted recreationally, and (2) that the TN-SWAP serves to promote common understanding of problems facing species and habitats across the state to encourage and prioritize collective action among a wide range of conservation partners.

The Introduction provides a history of the SWG program and SWAPs and describes the guidance materials used during the Plan revision, including several Association of Fish and Wildlife Agencies (AFWA) publications.

Chapter 1 provides an overview of the state and describes the Tennessee Wildlife Resources Agency's (TWRA) approach in revising the Plan. It describes the revision timeline and the planning team structure, which included TWRA staff and leadership, The Nature Conservancy, and technical consultants. It summarizes planning areas of emphasis for the 2015 revision, which include updates to the GIS database since 2005, the addition of Conservation Opportunity Areas (COAs), and the more in-depth consideration of climate change vulnerabilities. It also describes the 2015 revision processes for engaging technical and conservation partners and soliciting public comment (#7 and #8 of the 8 Required Elements).

Chapter 2 illustrates how the 2005 SWAP has guided conservation in Tennessee over the past decade. It provides multiple examples of how SWG funding has supported habitat and species population restoration, has helped leverage the conservation expenditures of other organizations, and has supported research and monitoring for a wide variety of species and the status of emerging threats such as White-nose Syndrome in bats.

Chapter 3 focuses on the identification, distribution, and abundance of species of Greatest Conservation Need (GCN) as well as the identification of priority habitats for the conservation of those species (#1 and # 2 of the required 8 Elements). Since 2005, more than 300,000 species occurrence records have been added to Tennessee's SWAP GIS database and the prioritization scoring process has been updated to include information on state and federal listing status and the age of an occurrence observation in the field. Also for the first time, plants have been included in the GCN species assessment. With 568 plant species designated as "Tier 4" GCNs, Tennessee now has identified 1,499 total GCN species. The 2015 SWAP focuses on habitat prioritization using a process that includes the 2001 Southeast Gap Analysis Project landcover mapping and a revised methodology for mapping habitats and species that increases the resolution of the data and the flexibility of analyses possible at different spatial scales.

Chapter 4 describes problems that may adversely affect species and their habitats (#3 of the required 8 Required Elements). The planning team determined that the problems identified in the 2005 SWAP are still largely representative of current problems for GCN species and habitats, including for newly designated GCN species. The focus in this chapter is on (1) providing a crosswalk of the 2005 problems to the most recent standardized threats classification from the Conservation Measures Partnership and (2) providing in-depth treatment of the major sources of stress to terrestrial, aquatic, and subterranean species and habitats in Tennessee. Two additional problems were added during this process: recreational area development and renewable energy development. Where possible, a spatial assessment was used to help identify the location of problems relative to priority GCN habitats. In 2015, climate change vulnerabilities are evaluated as a major new source of stress. The National Wildlife Federation and The Nature Conservancy prepared a separate climate change vulnerability assessment for Tennessee in support of the 2015 revision, expanding on a SWAP update report on climate change issued by TWRA in 2009.

Chapter 5 focuses on conservation strategies and actions that can address identified problems (#4 of the 8 Required Elements). The SWAP planning team determined that the 2005 strategy hierarchy, including all the General and Specific Actions, remained applicable to GCN statewide conservation efforts, and this chapter focuses on a subset of the most important actions for addressing the major problems identified in Chapter 4. As recommended by AFWA, a new strategy for prioritizing conservation activities is the identification of Conservation Opportunity Areas (COAs). The planning team considered three major attributes in designing COAs: GCN

habitat priority, the problems affecting the habitats, and on-the-ground opportunities to implement conservation actions. However, COAs are not intended to artificially constrain decisions about what strategic actions are needed and where they apply. To address climate change, the team also identified which goals and strategies of the National Fish, Wildlife, and Plants Conservation Adaptation Strategy best align with TWRA's mission and expertise. They then worked with the National Wildlife Federation to begin the process of identifying adaptation options for addressing anticipated problems highlighted in the "Climate Smart" Vulnerability Assessment.

Chapter 6 focuses on improving effectiveness monitoring in Tennessee (#5 of the 8 Required Elements). The plan outlines how metrics for SWAP-specific conservation actions have been cross-walked to the U.S. Fish and Wildlife Service's Wildlife/TRACS Reporting System hierarchy in preparation for the adoption of this system for tracking accomplishments in 2015. TRACS reporting units have also been assigned to each set of desired changes articulated for Tennessee's COAs. Another recommendation is to participate in collaborative efforts to improve monitoring capabilities at state and regional scales.

Chapter 7 addresses SWAP review procedures, coordination with both government and non-government partners, and processes for partner participation in the development and review of projects undertaken in accordance with the SWAP (# 6, 7, and 8 of the 8 Required Elements). Specifically, future SWAP reviews will be integrated with TWRA's cycles for strategic planning, operational planning, and annual planning. Partner engagement will be fostered through inclusion in SWAP-related planning cycles (such as those focusing on COAs), through expanded data-sharing, and through collaborative identification of emerging issues and lessons learned.

Highlights of appendices to this SWAP include:

- The revised 2015 list of GCN species
- A set of factsheets about each of Tennessee's 28 COAs, which include descriptions of habitats, issues, conservation and monitoring priorities, and partners as well as COA maps and detailed lists of GCN species occurrences within each COA.
- A factsheet on Climate Change and Potential Impacts to Wildlife in Tennessee
- Preliminary climate adaptation options for different sets of priority species and habitats

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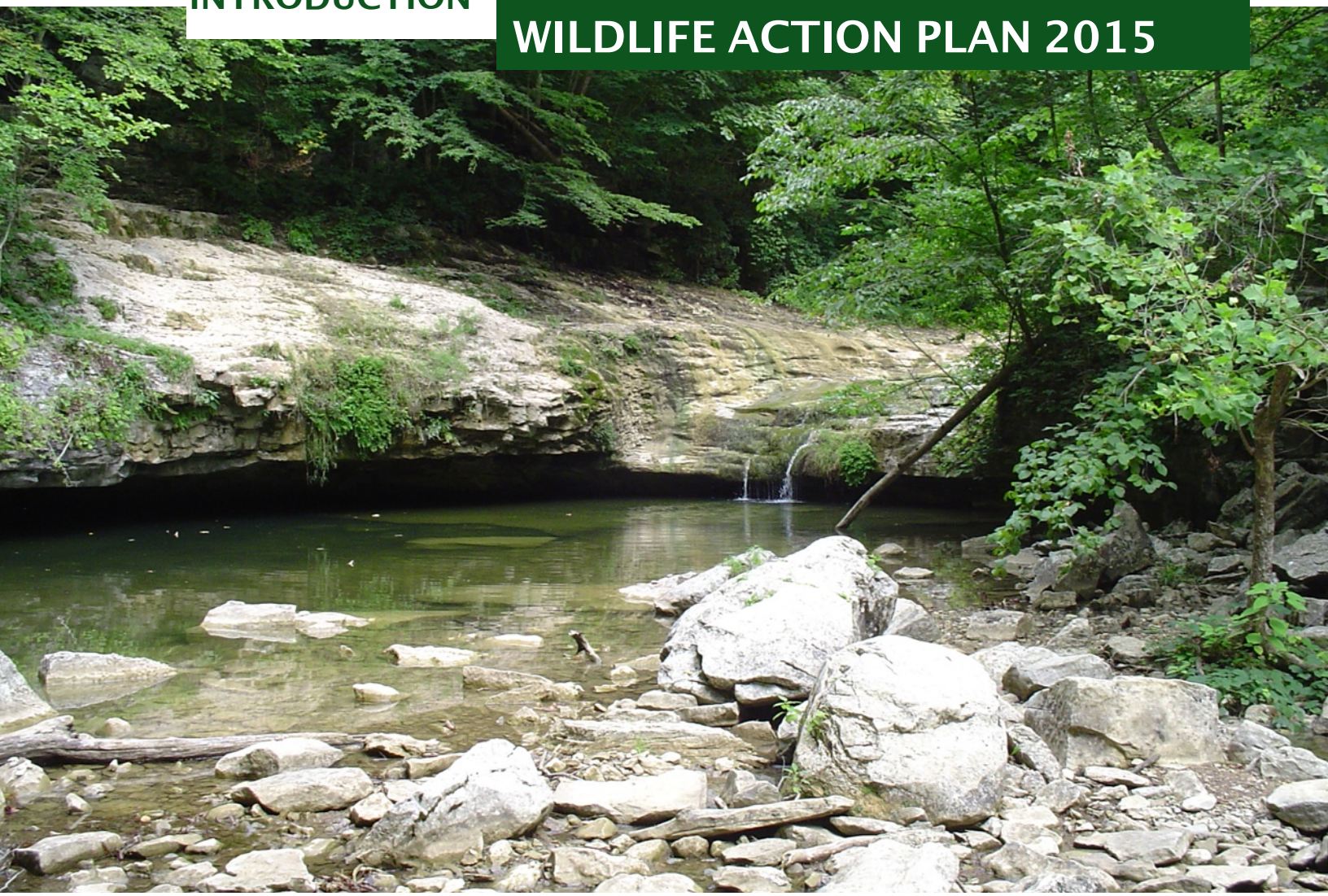
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List of Acronyms

Acronyms	
AAFB	Arnold Air Force Base
AFWA	Association of Fish and Wildlife Agencies
AKN	Avian Knowledge Network
ATV	All Terrain Vehicle
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CCVI	Climate Change Vulnerability Index
CMP	Conservation Measures Partnership
COA	Conservation Opportunity Area
C-RAC	Cumberland River Aquatic Center
CRP	Conservation Reserve Program
CRT	Cumberland Region Tomorrow
DOD	U.S. Department of Defense
EPA	Environmental Protection Agency
GCN	Greatest Conservation Need
GIS	Geographic Information Systems
GSMNP	Great Smoky Mountains National Park
HR	Herbicide-resistant
HUC	Hydrologic Unit Code
HWA	Hemlock Woolly Adelgid
ILP	Interior Low Plateau
LCC	Landscape Conservation Cooperative
MAV	Mississippi Alluvial Valley
MSA	Metropolitan Statistical Area
MTSU	Middle Tennessee State University
NCWMA	North Cumberland Wildlife Management Area
NF	National Forest
NFWF	National Fish and Wildlife Foundation
NFWPCAS	National Fish, Wildlife and Plants Climate Adaptation Strategy
NGESOP	Nongame and Endangered Species Operational Plan
NHDPlus	National Hydrography Plus (a dataset)
NID	National Inventory of Dams
NLCD	National Landcover Database

NP	National Park
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRRA	National River and Recreation Area
NWF	National Wildlife Federation
NWR	National Wildlife Refuge
OHV	Off Highway Vehicle
SF	State Forest
SHA	State Historic Area
SNA	State Natural Area
SP	State Park
SWAP	State Wildlife Action Plan
SWG	State Wildlife Grant
TADS	Tennessee Aquatic Database System
TCSI	Terrestrial Climate Stress Index
TDA	Tennessee Department of Agriculture
TDEC	Tennessee Department of Environment and Conservation
TDF	Tennessee Division of Forestry
TNBWG	Tennessee Bat Working Group
TNC	The Nature Conservancy
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USACE	U.S. Army Corps of Engineers
USDA	US Department of Agriculture
USFS	USDA Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Area
WNS	White-nose Syndrome

TENNESSEE STATE WILDLIFE ACTION PLAN 2015



I-1. From 2005 to 2015: Overview of the First SWAP Revision

TENNESSEE'S FIRST COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY (now known as the State Wildlife Action Plan or SWAP) was completed in 2005. In developing the 2005 SWAP, the Tennessee Wildlife Resources Agency, in collaboration with The Nature Conservancy, invested in the development of an integrated relational database and Geographic Information Systems (GIS) tool to serve three main purposes: (1) consolidate numerous datasets on species occurrences and habitats managed by different agencies and organizations in the state; (2) link the species and habitat data to a GIS platform to facilitate conservation priority mapping statewide; and (3) promote common understanding of problems facing species and habitats across the state to encourage and prioritize collective action (TWRA 2005, pp. 28-29).

This 2015 update of the State Wildlife Action Plan is a comprehensive revision intended to build upon the original 2005 assessment methods, tools, and planning process addressing the Eight Required Elements (see I-2.2.). In the creation of this revision document, the emphasis is placed on highlighting where data and methods have been added, revised, and updated; how decisions on addressing priority problems and strategies have been made; and the rationale for decision-making throughout the process.

Key attributes of this 2015 comprehensive revision include the expansion of statewide mapping efforts to include priority problems affecting habitats, the identification of Conservation Opportunity Areas, integration of climate change vulnerability assessments, and the targeting of priority conservation actions with both government agency and non-governmental organization (NGO) partners.



Loggerhead Shrike - Derek Bakken

I-2. Precedents and Requirements for State Wildlife Action Plans and Revisions

The development of State Wildlife Action Plans or SWAPs in every state and territory in 2005 was a historic milestone. All states completed plans following a similar, recommended format for the first time, which set the stage for better collaboration and decision-making on conservation priorities.

I-2.1. Mandating Legislation and Relationship to State Wildlife Grants

Congress funded the State & Tribal Wildlife Grants Program (commonly known as the State Wildlife Grant program or SWG) beginning in 2001. The focus of this program is to address important wildlife issues that have traditionally been underfunded and to "keep common species common." The SWG program is now the nation's core program for preventing endangered species listings. To receive funds, each state and

Photo credit previous page: Walls of Jericho - Josh Campbell, TWRA



Prescribed fire on Bark Camp Barrens WMA, Johnny Martin, Wildlife Technician - Josh Campbell, TWRA

territory is required to develop a "Comprehensive Wildlife Conservation Strategy," popularly known as a State Wildlife Action Plan or SWAP.

These first-of-their-kind plans are helping state fish and wildlife agencies and their partners target and improve management for the full array of fish and wildlife under their jurisdiction.

Although the focus of the SWG program and SWAPs is conservation of nongame wildlife species, many nongame conservation strategies and actions are habitat based and therefore benefit a wide range of species, including those that are common or hunted recreationally. SWAPs are intended to serve as adaptive management plans to be updated at regular intervals, the maximum interval being a 10–year cycle. The Tennessee Wildlife Resources Agency published a 2009 SWAP update on potential climate change impacts on the state's

I-2.2. SWAPs Must Address 8 Key Elements

In its directive to states on the development of State Wildlife Action Plans, Congress identified eight required elements and directed that the strategies must identify and be focused on the "species in greatest need of conservation" as well as address the "full array of wildlife" and wildlife-related issues (TWRA 2005). The following summarizes the Eight Elements and the chapters of this revision document which address each element:

(1) Information on the distribution and abundance of species of wildlife, including low and declining populations as the state fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the state's wildlife; [Ch 3]

(2) Descriptions of extent and condition of habitats and community types essential to conservation of species identified in (1); [Ch 3]

(3) Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats; [Ch 4]

(4) Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions; [Ch 5]

(5) Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions; [Ch 6]

(6) Descriptions of procedures to review the plan at intervals not to exceed ten years; [Ch 7]

(7) Plans for coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats; [Ch 1,7]

(8) Processes for broad public participation in developing, revising, and implementing these plans, the projects that are carried out in accordance with these plans, and the designation of species in greatest need of conservation. [Ch 1, 7]

wildlife and habitats. This 2015 update plan constitutes Tennessee's first comprehensive revision of all Eight Elements from its 2005 SWAP.

I-2.3. Agency Guidance for Plan Revision and Implementation

Since the first round of State Wildlife Action Plans completed in 2005, the U.S. Fish and Wildlife Service, the Association of Fish and Wildlife Agencies, and conservation partners have developed voluntary guidance to help states revise and improve their plans. These flexible guidance documents focus on identifying best practices for meeting each of the Eight Elements and also assist states in determining their approach to addressing climate change vulnerabilities for species and their habitats:

- 2007 U.S. Fish and Wildlife Service-issued **Guidance on SWAP revisions**;
- 2009 AFWA **Voluntary Guidance for States to Incorporate Climate Change into State Wildlife Action Plans** and Other Management Plans;
- 2011 AFWA **Measuring the Effectiveness of State Wildlife Grants** report;
- 2012 Association of Fish & Wildlife Agencies (AFWA) **Best Practices for State Wildlife Action Plans**;
- 2012 National Fish, Wildlife and Plants Climate Adaptation Partnership's **national strategy**.

The 2015 revision team has utilized these guidance materials throughout the update development process. Tennessee does not contain land and water areas under Indian tribal management nor have tribal programs affecting species and habitats covered by the plan. Therefore, TWRA did not engage tribal interests in the planning effort.

I-2.4. Plan Revision Features and the 2012 Best Practice Guidance

The 2005 Tennessee State Wildlife Action Plan illustrates many of the features highlighted in AFWA's 2012 Best Practices Guidance document including the use of the NatureServe ranking methodology for assessing species conservation status; standardized habitat classifications, problem and strategy hierarchies; mapping of habitat priorities statewide; and using the input of many public and private partners in the plan's development. The 2015 update effort expands on those original approaches using the Best Practice Guidance, with a particular emphasis on the addition of plants as GCN species; updating habitat mapping to standardized units from nationwide datasets; selecting "Conservation Opportunity Areas" as strategic places to focus actions and partner engagement; alignment of program effectiveness measures to facilitate project reporting in the new U.S. Fish and Wildlife Service TRACs system; and the design of new stakeholder outreach tools including updating the Teaming With Wildlife coalition contact list, a new e-newsletter, and redesigning the Tennessee State Wildlife Action Plan website. For a list of specific Best Practices used by the 2015 revision team, please refer to Appendix A.



CHAPTER 1

OVERVIEW OF TENNESSEE AND APPROACH TO THE STATE WILDLIFE ACTION PLAN

1.1. The State of Tennessee

WHEN IT COMES TO NATURAL RICHES, Tennessee is a state of superlatives. The geography of the state varies from the wetlands and bottomland hardwoods of the Mississippi River to the sheltered valleys and 6000-foot peaks of the Appalachians, where Southern Blue Ridge forests are considered one of the most biologically diverse temperate hardwood regions in the world (Stein et al. 2000). Tennessee is one of the most diverse inland states in the country, ranked by NatureServe as second in freshwater fish species diversity, fourth in amphibian diversity, and 13th overall compared with all other states (Stein 2002).

Tennessee's large expanses of limestone geology contribute to the development of thousands of cave systems, which are known to rank second in the U.S. for their number of obligate subterranean species (Niemiller and Zigler 2013). With 86 native crayfish found everywhere from caves and swamps to streams and lakes, it may top the list for crayfish diversity as well (Williams et al. 2014). Seven of the eight most ecologically rich rivers in the country are found in Tennessee (TWRA 2005), including the Duck River, recognized as **one of the most biodiverse waterways in the U.S.** (National Geographic 2010). Tennessee also has a rich floristic heritage: with 2,395 species, the state ranks 17th for its plant diversity (Stein and Gravuer 2008). The state's wide range of physiographic provinces and geology, temperate climate, and the fact that this region escaped the last glacial advance all contribute to the state's current species and habitat diversity. Six major terrestrial ecoregions are commonly recognized in Tennessee, from west to east (adapted from Bailey 1994; Keys et al. 1995):

Photo credit: Overlook Smoky Mountains - Ed Selby; Tennessee silhouette - Gograph.com

- Mississippi Alluvial Plain
- Upper Gulf Coastal Plain
- Interior Low Plateau
- Cumberland Plateau and Mountains
- Ridge and Valley
- Southern Blue Ridge

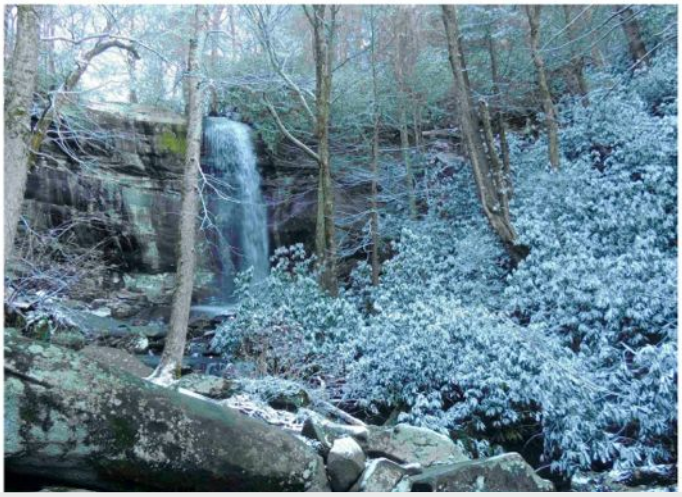
Tennessee also shares five major aquatic regions with neighboring states, defined by portions of five major river drainages:

- Mississippi River
- Tennessee River
- Cumberland River
- Barren River
- Conasauga River

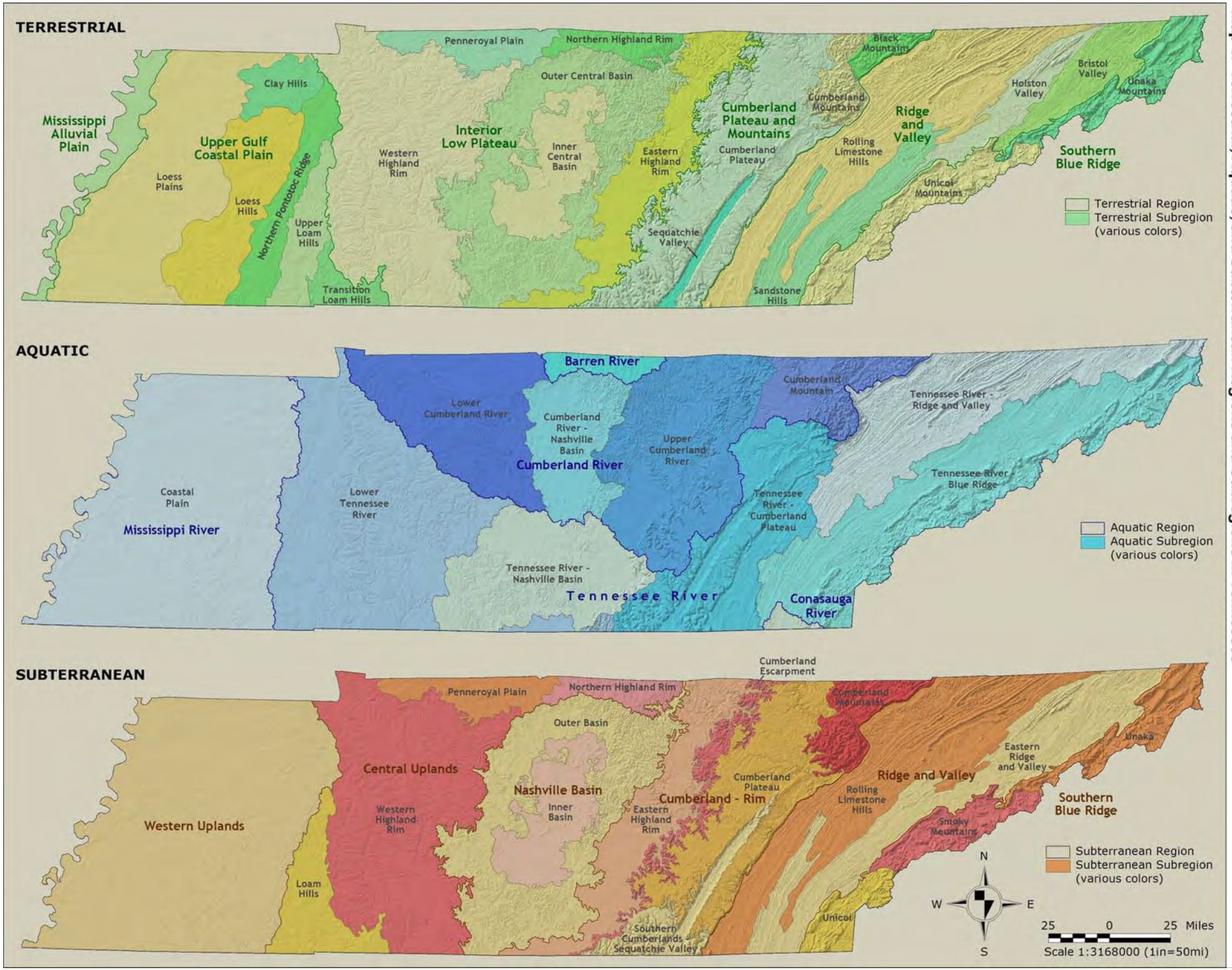
The subterranean landscapes of the state are also classified into regions and subregions in a fashion similar to terrestrial ecoregions, with more detail given to subsurface geological distinctions (TWRA 2005).

The State Wildlife Action Plan uses the classification of Tennessee's terrestrial, aquatic, and subterranean regions as the background for understanding the distribution of species of Greatest Conservation Need (GCN) and their habitats (Map 1). Chapter 1 of the 2005 TN-SWAP provides extensive detail of the dominant geology, vegetation, flora and fauna of each of these regions statewide (TWRA 2005).






Clockwise from upper left: Natchez Trace - Leigh Ann Fowler; Walls of Jericho amphitheater - Josh Campbell, TWRA; Sunset Rock on Lookout Mountain - Ron Jones; Rainbow Falls, Great Smoky Mountains National Park - Gregg Elliott, K Gregg Consulting



Map 1. Terrestrial, Aquatic, and Subterranean Regions and Subregions in Tennessee

1.2. Approach to the 2015 Plan Revision

1.2.1. Alignment with TWRA Strategic and Operational Planning

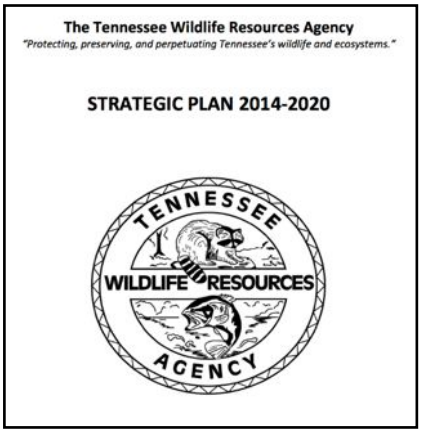
In 2005, Tennessee's planning team developed the first SWAP document in alignment with the guidance available from the U.S. Fish and Wildlife Service (USFWS) at the time. The next step after completing the SWAP was to develop a 2006-2012 Operational Plan (TWRA 2006) to align agency nongame species and habitat conservation activities with the Tennessee Wildlife Resource Agency's overall strategic planning approach. Many of the projects outlined in the 2006-2012 Operations Plan have been completed, and some are described in Chapter 2.

Tennessee's 2005 SWAP has guided wildlife conservation and the expenditure of State Wildlife Grants since 2005.

Highlights of Tennessee's first SWAP

- Identified 664 species of "Greatest Conservation Need" (GCN), representing birds, mammals, reptiles, amphibians, fish, mussels, crayfish, snails, and other invertebrates. These species inhabit all regions of Tennessee, including terrestrial, aquatic and subterranean habitats.
- Elevated knowledge of the state's biodiversity to an unprecedented level.
- Provided a solid scientific foundation for the state's future land conservation initiatives.
- Provided detailed information for federal agencies and Tennessee state agencies (e.g., Dept. of Transportation, Dept. of Environment and Conservation, etc.) to utilize in their own planning and operational activities.
- Provided detailed information for Tennessee counties and local communities to develop growth plans that consider the needs of Tennessee's fish and wildlife resources.

In 2014, TWRA completed its **2014-2020 Strategic Plan**, which provides an over-arching vision, broad-based goals, and strategies for achieving those goals in four main areas of operation: wildlife management, outdoor recreation, law enforcement, and information/education (TWRA 2014). To a significant degree, the operations of all four of these programs are essential to successfully managing Tennessee's GCN species. The planning approach of the 2005 SWAP, particularly the approach to using standardized habitat classification and species data, influenced the development of TWRA's 2014 Strategic Plan: for the first time, a habitat-based approach to defining priority management outcomes was used as the focus of the agency's Wildlife Resource Program.



For this reason, the 2015 SWAP Revision aligns with

TWRA's 2014-2020 Strategic Plan in the following ways:

- the plans use the same classification scheme for defining habitats;
- the plans focus on habitat conservation priorities to facilitate species management; and
- the plans are oriented toward achieving similar high-level outcomes.

The 2015 SWAP revision team worked intentionally with other divisions of TWRA to foster collaboration and identify shared conservation priorities using common understandings of habitats and problems affecting species and habitats statewide.

1.2.2. Revision Team Structure and Planning Objectives

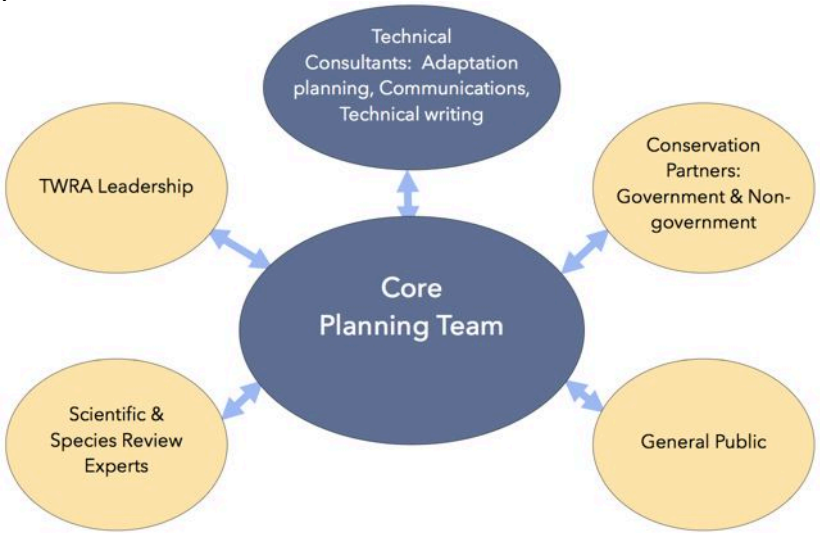
TWRA and The Nature Conservancy have made continuous investments in species monitoring data development and the SWAP relational database/GIS tool since the publication of the first SWAP in 2005. Chapter 2 of this report highlights many examples of on-the-ground conservation implementation as well as improvements to conservation data and planning methods. TWRA also completed an **internal revision of the 2005 SWAP** examining potential climate vulnerabilities of species and habitats statewide in 2009.

For the 2015 Comprehensive Review process, TWRA and TNC designed a team planning process (see Figure 1) focused on the following objectives:

1. Take advantage of core competencies within TWRA staff and meet capacity gaps with additional technical advisors (e.g., climate adaptation planning, communications, and technical writing);
2. Effectively engage all TWRA divisions and leadership at appropriate junctures in the planning process;
3. Achieve broad review of updated species list by technical experts;
4. Effectively engage government and non-government conservation partners to identify priorities for collaboration;
5. Develop the foundation for improved public communications, access and engagement with the State Wildlife Action Plan.

The core planning team designed a project approach to ensure comprehensive review of all Eight Elements from the 2005

Figure 1. **Conceptual diagram of the relationship between the core planning team, advisors, partners, and the general public.**



SWAP using the 2012 AFWA Best Practice Guidance recommendations wherever feasible. The overarching objectives of the 2015 revision process were to expand from the solid data assimilation and methodological approaches developed by the team in 2005, re-engage a diverse set of technical reviewers and collaborators, and apply the concept of Conservation Opportunity Areas as an additional strategic framework to inspire on-the-ground conservation delivery with a variety of partners.



Clockwise: Wood Thrush - Cynthia Routledge; Green Salamander - Josh Campbell, TWRA; Redline Darter - Todd Stailey, Tennessee Aquarium; Mud Snake - Rob Colvin, TWRA

1.2.3. Revision Process Timeline and Activities

The time schedule on the following page provides a summary of the major activities executed during the July 2013 through September 2015 comprehensive review period. Chapters 3 through 7 of this report provide detailed information regarding specific approaches, results, and outcomes of the revision process.

1.2.4. Summary of 2015 Planning Areas of Emphasis

The architecture of the 2005 SWAP database was designed to facilitate the incorporation of new and revised data over time. Since its initial development, various components of the database have been updated, revised, and expanded to support new planning and conservation mapping needs. One significant data development project led by Tennessee Department of Environment and Conservation Division of Natural Areas staff allowed for the addition of plant species to the SWAP database, along with their habitat preferences assigned to the same ecological systems as terrestrial animal GCN species.

Database improvements during the 2015 revision process also include the addition of thousands of species observation records, new standardized mapping units for terrestrial and aquatic priorities, updated landuse/landcover information, and the capacity to integrate spatial data on priority problems to understand the extent of potential impact to species and habitats across the state. The result is a comprehensive relational database management system and GIS platform for plant and animal species of greatest conservation need, their habitats, and the problems affecting them both.

SWAP Revision Time Schedule of Major Activities

July 1 – September 2013: Project Launch

- Notification to the Service of the formal revision process, including completed project management chart
- Core planning team defined. Species experts, Conservation Partners, and TWRA leadership groups identified and contacted
- Draft approach to public outreach completed
- Methods for assessing climate vulnerability reviewed

October 1 – December 2013: Species and Habitat Reviews

- Species and technical experts convened to review species of Greatest Conservation Need (GCN) list
- Core planning team assigns habitat preferences for GCN species added to list
- SWAP relational database updated with most currently available species observation data for all 2015 GCN species

January - March 2014: Problems and Action Reviews

- Core team review of 2005 hierarchy for problems affecting GCN species; selection of problems for 2015 mapping and focal strategies
- Core team review of 2005 priority actions to improve GCN species' habitat and status
- NatureServe Climate Change Vulnerability Index tool utilized to assess species vulnerability for a subset of GCNs across all faunal groups
- National Wildlife Federation engaged to assist with vulnerability summaries and ClimateSmart adaptation planning
- Communications program for general public and non-governmental organization partners developed

April – June 2014: Completion of Problem and Action Assessments, Draft Habitat Priority Maps

- Completion of selected GCN species Climate Change Vulnerability Index assessments
- Updated maps of habitat priorities statewide completed
- Core team begins consideration of Conservation Opportunity Area (COA) development and priority actions within COAs

July – September 2014: Development of Draft COAs and TWRA Leadership Engagement

- Draft Conservation Opportunity Areas assigned by core planning team
- Determination of high-level desired outcomes for COAs and assignment of draft primary conservation actions
- TWRA Leadership workshop held to gather feedback on process, COAs, and partnership recommendations

October - December 2014: ClimateSmart Team Workshop and Draft Revision Document Review

- Presentation to the **Organization of Fish and Wildlife Information Managers** on SWAP GIS habitat priorities
- NWF workshop on key climate vulnerabilities/determination of climate-smart strategy development approach
- Core team review of initial update document draft to approve format and primary content

January - July 2015: Conservation Partners Engagement and Strategy Alignment

- Refinement of draft COAs by core team
- Alignment of primary conservation actions with Wildlife TRACs framework
- ClimateSmart vulnerability report and strategy recommendations completed
- Incorporation of climate-smart strategy considerations into COA framework and conservation action selection
- Government agency and non-government organization partner workshops/comments incorporated into COAs
- SWAP presentation made before **Tennessee Geographic Information Council**

August 2015: Public Review of Draft Plan

- 2015 Update document available for TWRA Leadership comment
- 2015 Update document draft posted on website for public comment and publicized
- Public comments and additional Conservation Partners feedback collected

August – September 2015: Revision and Submission

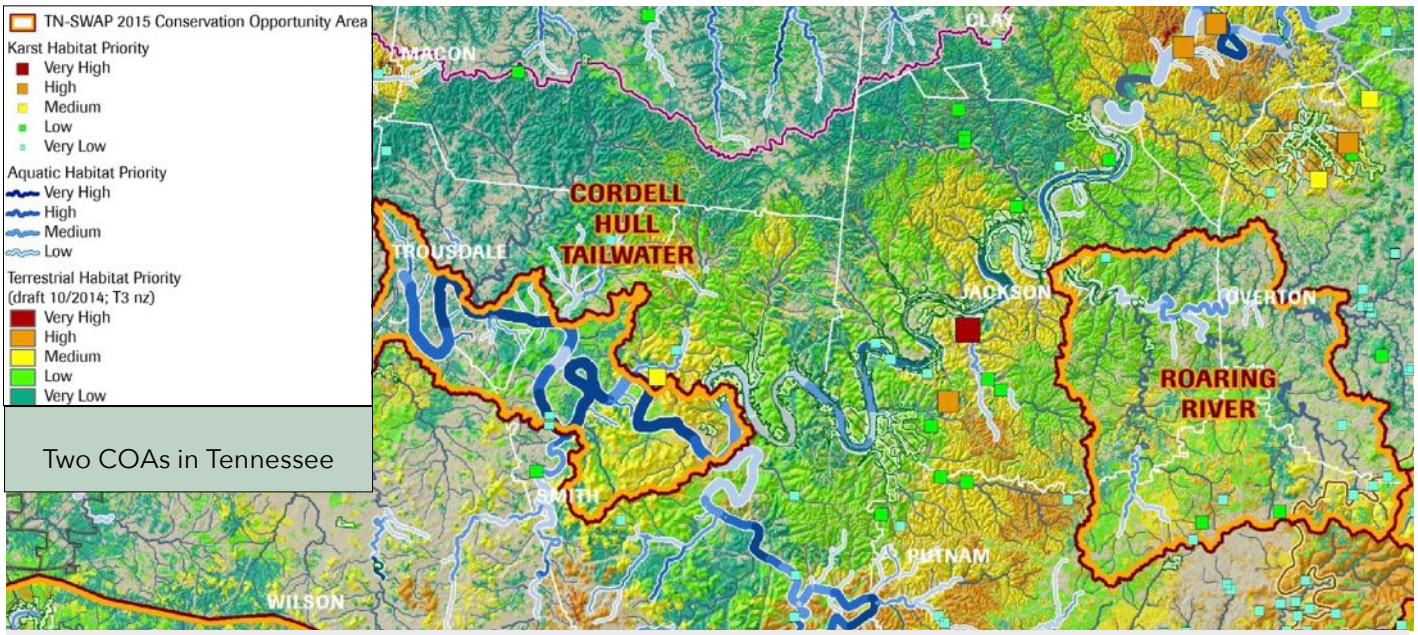
- Response to public comments and completion of final 2015 Update report
- Submission of update report to USFWS for review prior to October 1

Conservation Opportunity Areas

One of the best practices for revising SWAPs is designation of Conservation Opportunity Areas, or COAs. Conservation Opportunity Areas are areas with the greatest opportunity for conserving, preserving, or restoring habitat critical to GCN species, and they will facilitate outreach and coordination with partners, extending the reach and effectiveness of state resource agencies.



Agricultural runoff - Lynn Betts, USDA NRCS

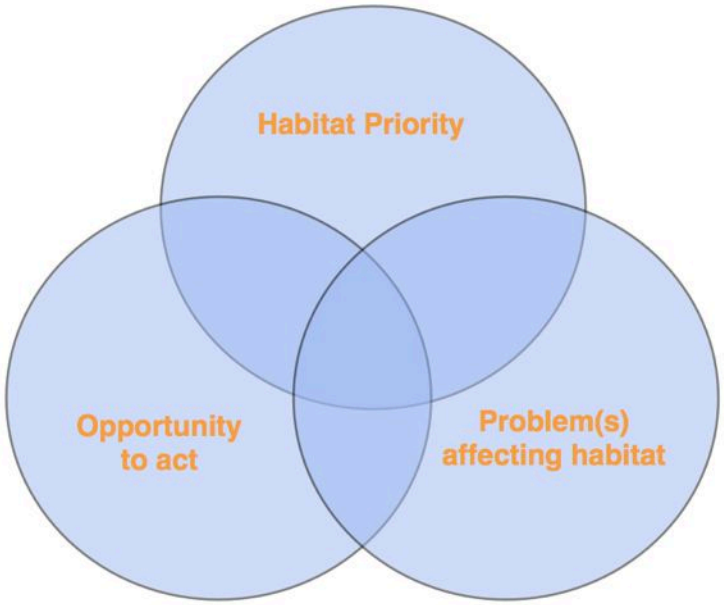


Two COAs in Tennessee

Example of a Conservation Opportunity Area

The identification of Conservation Opportunity Areas does not create nor presume to create new jurisdictional boundaries, regulatory authorities, or land use restrictions. COAs are intended to provide a framework for guiding voluntary and partnership-focused conservation action to address priority problems and achieve improved outcomes for species and habitats. Figure 2 depicts the general approach for the selection of Conservation Opportunity Areas. Chapter 5 gives more detail on the identification of COAs during the 2015 revision process.

Figure 2. Conceptual design of Conservation Opportunity Area selection



Climate Change

Nationwide there is growing recognition that without attending to the future impacts of climate change, it will become increasingly difficult to achieve the goals of protecting priority habitats and preventing wildlife and plant species from declining to the point of endangerment (National Fish, Wildlife, and Plants Climate Adaptation Partnership 2012). In particular, relying on historical conditions for factors such as average annual and seasonal temperatures, timing of streamflows, vegetation distribution, and species ranges will no longer be sufficient as a benchmark or goal for conservation decisions.

To meet this challenge and to follow the guidelines laid out by the Association of Fish & Wildlife Agencies in its report *Voluntary Guidance for States to Incorporate Climate Change into State Wildlife Action Plans,* TWRA contracted with the National Wildlife Federation - a leader in **Climate Smart conservation planning** - to prepare both a vulnerability assessment



Reelfoot Lake cypress swamp, dry during 2010 drought - Gregg Elliott, K. Gregg Consulting

summary for the state and guide the core planning team on selection of appropriate adaptation strategies.

The *Climate Change Vulnerability Assessment for Tennessee Wildlife and Habitats* (see Glick et al. 2015) provides an overview of current and projected climate change across the southeastern United States, including Tennessee, and summarizes recent efforts to assess the vulnerability of the state's wildlife species and habitats. The vulnerability assessment focuses on three main areas: species vulnerability, potential vegetation change, and landscape feature resiliency. Resources used to complete the assessment included NatureServe's Climate Change Vulnerability Index for species (Young et al. 2011), the Terrestrial Climate Stress Index for vegetation developed by the U.S. Forest Service (Joyce and Flather, personal communication, 2015), and The Nature Conservancy's resilient sites for terrestrial conservation in the Southeast U.S. (Anderson et al. 2014).

Measuring Progress

Wildlife TRACS is the tracking and reporting system for conservation and related actions funded by the U.S. Fish and Wildlife Service (USFWS) Wildlife and Sport Fish Restoration (WSFR) Program. Beginning in 2015, all State Wildlife Grant-funded projects must also be tracked and reported through this system. In developing the 2015 SWAP, TWRA decided to align the major conservation actions in the plan with the format of TRACS conservation reporting measures as an overarching classification method for tracking and reporting on effectiveness measures for conservation projects. This will improve the agency's results accounting, project monitoring, grant reporting, and ultimately the assessment of success in

Wildlife TRACS Project Action Levels with Indicators 8/20/14

Project Level	Action Level 1	Action Level 2	Action Level 3	Level 2 and Level 3 Output Measures	Description/Examples/Notes
Project Catagories	**Category**	**Strategy**	**Activity**	**Units**	
Administration and/or Conservation / Management and/or Recreation	Coordination and Administration			Number	Coordination and administration necessary for effective agency operations and program/project management
		Coordination and Administration	Agency administrative support	Number	Administration necessary for effective agency operations (e.g., acquisition of goods and services, human resources tasks)
			Program/project administrative support	Number	Administration necessary for effective program/project management (e.g., staff support and training, monitoring progress of grant proposal and reporting processes)
		Incentives	Incentives	Number	Development and delivery of economic incentives to private landowners to influence responsible stewardship of land/water and specific species
	Direct Management of Natural Resources				
		Create new habitat or natural processes		Acres	Creation of new habitat or natural processes for the benefit of fish and wildlife and recreational users
			Habitat conversion	Acres	Conversion of one type of habitat into another (e.g., creating bottomland forest from agricultural land, wetland creation) Note: Forest and wetland would be the appropriate broad habitat types to code for these two examples
			Public fishing lake construction	Acres	Construction of new public fishing lakes
			Waterfowl impoundment creation	Acres	Creation of shallow water impoundments for the primary benefit of waterfowl
				Structures	Removal of barriers to maintain aquatic species populations and restore ecological functions in streams (e.g., dam or dike removal, notching of dams)

Examples of TRACS Conservation Reporting Measures

implementing State Wildlife Action Plan conservation strategies.

1.2.5. Conservation Partners Engagement

The Tennessee State Wildlife Action Plan is not intended solely for the Tennessee Wildlife Resources Agency, but rather for all stakeholders – large and small – within Tennessee who care about wildlife or make decisions affecting the state's land and water resources, including TWRA. As such, the agency recognizes the importance of partner and public involvement in the plan development process. Following best practices for state conservation programs (AFWA 2012), TWRA reached out to the biological research community to aid in reviewing and updating the GCN species list. Workshops were held and presentations made for conservation partners from other programs within TWRA itself, key state and federal agencies, academic and research institutes, nonprofit organizations, and interested citizen stakeholders.

1.2.6. Public Outreach and Communications: process, website, press release, e-newsletter

Early in the project planning phase, the core team recognized the need for improving the overall approach to engaging conservation partners and the general public. A communications expert was hired specifically to manage outreach. Techniques involved the overhaul of Tennessee's Teaming With Wildlife distribution list, development of quarterly electronic newsletter updates to partners, coordinated press releases sent out to statewide media, and the redesign of the Tennessee State Wildlife Action Plan website (**www.tnswap.com**). The SWAP webpage provided the capacity to receive, collect, and archive comments on the draft SWAP from any and all interested citizens during the official public review period. Comments were sorted according to category or topic, then considered and answered by the appropriate experts on the SWAP team. Appendix B provides an explanation of what actions, if any, were taken in response to comments raised during the review period.



Example of a quarterly e-newsletter sent to SWAP stakeholders.



CHAPTER 2

TENNESSEE STATE ACCOMPLISHMENTS UNDER THE 2005 SWAP

2.1. How the 2005 SWAP Guided Conservation Efforts

OVER THE PAST DECADE, the State Wildlife Action Plan has guided many agencies and organizations in conducting habitat and nongame species conservation throughout Tennessee. The State Wildlife Grant program (SWG) in particular has also influenced conservation investments across Tennessee. These grants were created by Congress to help keep species off of Threatened and Endangered (T&E) Species Lists, but to do so, they must be applied strategically; that is the role of the State Wildlife Action Plan. The 2005 SWAP identified 37 potential sources of stress affecting species of Greatest Conservation Need (GCN) and their habitats. Incompatible land use and development was identified as the primary problem facing the widest variety of species and habitats statewide (TWRA 2005). Alteration of streams and river habitats, degraded water quality, poor land management practices, natural fire suppression, and invasive exotic species were other priority problems linked to species and habitat declines in the 2005 SWAP.

To meet these challenges, SWG funding has supported habitat restoration, dam removal, and species reintroductions aimed at increasing populations of key GCN species. SWG funds have also helped to leverage the conservation expenditures of other organizations. Research and monitoring of a wide variety of species has resulted in vastly improved understanding of the distribution and needs of Tennessee's GCN species, which in turn results in improved management and conservation planning.

Photo credit: Early successional habitat, Bridgestone WMA, White Co. - Greg Wathen, TWRA

Research projects are also tracking the status of emerging threats such as White-nose Syndrome – a disease that is ravaging bat populations across the eastern U.S. – and the chytrid fungus and ranavirus, both of which threaten the state's diverse amphibians. Finally,

A major goal of State Wildlife Action Plans is to "keep common species common."

the extensive spatial data upon which the SWAP is built, combined with strategic granting of SWG dollars, have informed local community planning aimed at promoting ecotourism and protecting local heritage and natural areas.

2.1.1. Restoring and Managing Habitat to Benefit Wildlife

The 2005 SWAP identified "Priority Terrestrial Restoration Portfolios" for the six ecoregions of Tennessee. Recommendations generally focused on bottomland hardwood forest restoration in western Tennessee, and dry oak forest and woodland restoration in eastern Tennessee. The SWAP also consistently recognized that the restoration of natural grassland systems would increase overall value to GCN species, since very few examples of natural grasslands remain (TWRA 2005, pp. 127, 131, 142). A recommended strategy was to address areas degraded by altered fire regimes through the application of prescribed fire management.

Bringing back oak savannah

At Catoosa Wildlife Management Area (WMA), a project to restore oak savannah and open woodland habitats has been ongoing since 1999. Canopy reduction plays a crucial role in the restoration process. To date, more than 3,100 acres of mixed pine forest has been cleared or thinned. Prescribed fire is applied regularly in the understory to promote native grasses such as big bluestem and wildflowers such as rattlesnake master and blazing star – species that thrive in more open conditions. The new growth provides abundant food in the form of seeds, sprouts, and legumes for birds, deer, and many other species. Native grasses benefit Bobwhite Quail, a GCN species whose populations have been in decline for decades, and the scrub-shrub habitat attracts songbirds such as Hooded Warblers, Common Yellowthroat, Yellow-breasted Chat, Eastern Towhee, Field Sparrow, and Red-headed Woodpeckers. This project has received support from at least 14 different agencies, organizations, and funders,





Top: Catoosa WMA 1 month post-burn in spring; Bottom: Catoosa 2.5 years post-burn - Clarence Coffey

while also hosting a wide variety of researchers helping to catalog the response of wildlife and plants to the restoration (Woody 2011).

Aquatic restoration through small dam removal

The 2005 SWAP highlighted existing impoundments and dam construction as a priority source of stress affecting aquatic habitats throughout much of Tennessee. Since 2005, State Wildlife Grant (SWG) funds and other partnership efforts have focused on piloting small dam removals to improve stream habitat, water quality, and recreational opportunities.

Multiple government agencies and the nonprofit Harpeth River Watershed Association removed a **lowhead dam on the Harpeth River** near Franklin, TN in 2012 – the state's first – eliminating a recreational hazard while improving and increasing habitat for a wide diversity of native fish and mussels.

On September 19, 2014, the Tennessee Wildlife Resources Agency (TWRA) took down remnants of the **Brown's Mill dam** on the East Fork of the Stones River. This project resulted in 25 miles of improved free-flowing stream, providing habitat for scores of aquatic species, including three GCN species.



Removing Brown's Mill Dam, inset: dam before removal - Pandy English, TWRA

Benefits to species of greatest conservation need identified in the SWAP provide a rationale for large projects such as these. In addition to a SWG, the Brown's Mill dam removal was supported by funding from the **Tennessee Healthy Watershed Initiative**.

2.1.2. Controlling Destructive Invasive Species

Wild Hogs

Wild Pigs, also called Wild Hogs, wreak havoc in natural habitats and rural communities through habitat destruction – which occurs when they dig up the ground rooting for food – and directly through predation of native species. It is likely that Wild Hogs pose a significant threat to Tennessee's native amphibians and reptiles, many of which are GCN species (Jolley et al. 2010), as well as native plant communities, including some GCN plant species. TWRA conducts an ongoing statewide Wild Hog eradication program, using trapping equipment that was originally purchased with SWG funding. Tennessee is a leader among state



Trapped Wild Hogs - Scott Dykes, TWRA

agencies in developing its hog trapping methodology.

TWRA has taken a rare stance by closing Wild Hog hunting in favor of other methods of control, a decision made to reduce the likelihood of the spread of Wild Hog populations for recreational purposes.

2.1.3. Improving Decisions through Data Collection and Analysis

Two Strategic Plans issued subsequent to the 2005 SWAP identified the lack of information on (1) the status of nongame species populations, (2) their ecological limiting factors, and (3) needed management as priority issues. Since implementation of the 2005 State Wildlife Action Plan began, TWRA Wildlife Diversity staff have conducted surveys on 41 Wildlife Management Areas (WMAs), 1 refuge, 6 wetlands, and 6 state natural areas/state parks, as well as other key areas across the state.

These surveys have determined the presence, absence, and habitat preferences of GCN species and have produced over 68,000 observations of herpetofauna and mammals (both volant and non-volant), including 2,735 captures of GCN species. TWRA maintains all survey data, and these data have significantly increased occurrence records in the 2015 SWAP GIS relational database. Data collected through these and partner survey efforts are incorporated into management plans developed for WMAs and help to inform the development of habitat management or restoration projects to directly benefit GCN species. Additional monitoring projects have incorporated the ability to track species' response to management activities, such as the Golden-winged Warbler's response to habitat restoration at Hampton Creek Cove (see Golden-winged Warbler Case Study, Ch. 5).

New bat maternity colonies discovered

Bats are now widely recognized for their role in insect control, yet many species are declining or already rare. Tennessee has 16 insectivorous bat species, of which 9 are GCN species. TWRA initiated a migration study of the federally **endangered Indiana Bat** in 2009, which continues annually with the support of SWG and other federal funds. The project has resulted in the discovery of six previously unknown Indiana Bat maternity colonies in Tennessee and improved knowledge of cave habitat use by other bat species. Four of the colonies are in Wilson County, one in McNairy County, and another spans Benton and Henry counties.



Indiana Bats - Dustin Thames, TWRA

Maternity colonies were also discovered in other states, including a colony discovered in 2013 on Holly Springs National Forest in Mississippi, which represents the first Indiana Bat maternity colony ever discovered in that state. Understanding the range, roosting, and maternity needs of all GCN bat species is important for informing bat conservation, targeting habitat management, understanding the effects of weather on bat migration and stopover habitat needs, and tracking the progress and impacts of White-nose Syndrome.

Tracking the effects of a deadly disease

White-nose Syndrome (WNS), a devastating disease of bats caused by the *Pseudogymnoascus destructans* fungus, was first identified in Tennessee in 2010 and has begun to negatively impact many cave-hibernating bat species. The ecosystem role of bats in controlling insect pests is extremely valuable to society; therefore, TWRA will continue to partner with universities and NGOs to better understand and mitigate impacts of WNS in Tennessee. Since 2010, and as a result of WNS, TWRA has worked to improve bat monitoring protocols, which include use of acoustic call surveys in key areas and increased thermal imaging of Gray Bat maternity sites to better understand the impacts of WNS on bat populations. Acoustic data collection efforts have been expanded from summer months to winter months to determine bat activity levels during the coldest portions of the year – a key to understanding potential impacts of WNS.



Hibernating Gray Bats at Bellamy Cave - Josh Campbell, TWRA

2.1.4. Protecting Lands and Waters in Perpetuity

Priority bat caves in Tennessee

Priorities identified in the SWAP consistently guide land acquisition to protect sites critical to GCN species across Tennessee, in some cases with SWG funding leveraging additional sources of support. For example, since 2005 TWRA has purchased property surrounding two of the three largest bat caves in Tennessee: Bellamy Cave in Montgomery County (34 acres in 2007, and 5 acres added in 2013 with a State Wildlife Grant) and Pearson Cave in Hawkins County (102

acres in 2009, and 46 acres added in 2013 with SWG funding).

Bellamy Cave is a top priority Gray Bat hibernaculum (overwintering site) whose population increased dramatically following protection through gating, from 91,000 in 2002 to over 381,000 in 2014. This increase occurred despite the discovery of WNS at the cave in 2012.

Pearson's Cave is an important Gray Bat hibernation and summer roosting site. The Gray Bat Recovery Plan identifies the acquisition of Pearson Cave as essential to prevent extinction of Gray Bats. Winter surveys at Pearson Cave have shown just how wintering populations may vary and move between caves. Surveys have indicated population sizes of over 365,000 (2002), over 147,000 (2013), and over 331,000 (2014). Populations have remained stable despite the discovery of WNS in 2012.



Cerulean Warbler - Ed Schneider





Golden-winged Warbler - Greg Levaty, USDA; Bog Turtle with tracking transmitter, showing characteristic yellow neck marking - Scott Dykes, TWRA

Specialized habitats for GCN species

Other acquisitions of land include 49 acres adjoining a conservation easement in Roane County (purchased with SWG funds in 2013), which provides critical habitat for Cerulean Warbler, Swainson's Warbler, Southeastern Shrew, Meadow Jumping Mouse, Woodland Jumping Mouse, Northern Pine Snake, and Tennessee Dace. Six acres purchased in Johnson County (with 2012 SWG funding, leveraging state wetland acquisition funds), expanded a southern cranberry bog preserve managed by The Nature Conservancy. This rare habitat type benefits several GCN species, including Golden-winged Warbler and Peregrine Falcon, Meadow Jumping Mouse, Southern Bog Lemming, and Bog Turtle. All of these

acquisitions address threats to the species posed by development, incompatible forestry, and placement of new utility infrastructure.

2.1.5. Data-driven Planning

The 2005 SWAP recognized sprawl as the single greatest threat to Tennessee's remaining natural landscapes. To address this threat, it provided maps and data that could be used to identify critical watersheds for protection.

Improved agency planning and coordination

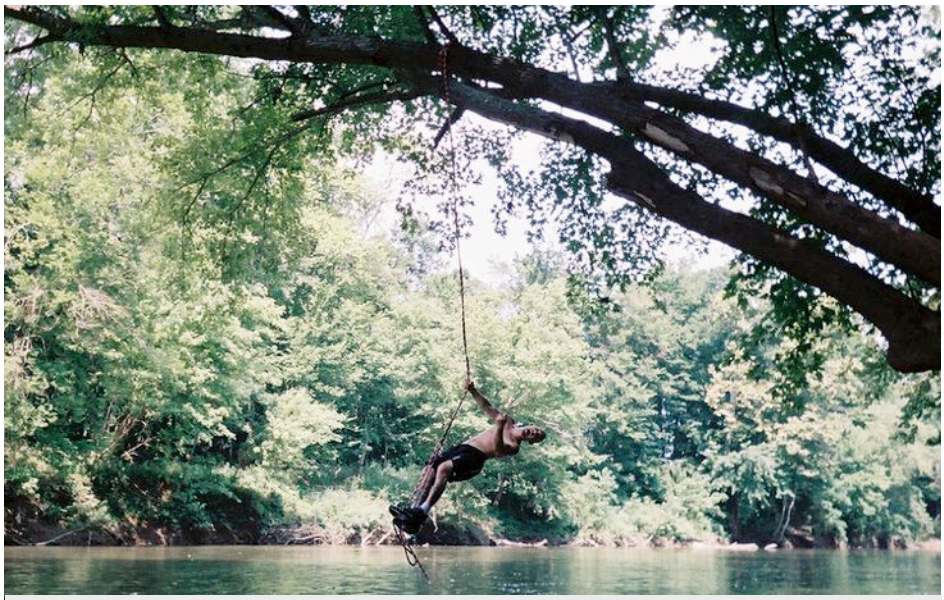
Beyond TWRA, organizations and agencies that protect or manage land in perpetuity, such as land trusts, Tennessee Department of Environment and Conservation, U.S. Fish and Wildlife Service, National Park Service, and the USDA Forest Service use the SWAP to identify and justify the protection of critical wildlife tracts. By working with TNC and TWRA GIS staff, species and their associated habitats can be identified for potential protection. Other agencies such as the USDA Natural Resources Conservation Service and Tennessee Division of Forestry can use the current and future Plans to identify watersheds and specific sites where improved land management will benefit GCN species and their habitats.

Community plans: protecting habitat and growing sustainably

Community planning is another arena that has benefited by incorporating data from Tennessee's SWAP. TWRA has supported local planning initiatives in several regions across the state:

✦With SWG funding, Cumberland Region Tomorrow (CRT) used the SWAP GIS database to create **"GIS Greenprint Tools"** for the Middle Tennessee Region; it has been used in the comprehensive planning process for four counties and two cities. The tools highlight critical lands for conservation to assist in strategic open space conservation and transportation planning in the 10-county CRT region (Elliott 2010).

✦The Tennessee Wildlife Federation developed a rural county planning document, also with SWG support, to better understand issues surrounding conservation planning in rural counties of the Southern Cumberlands (Elliott 2010).



Harpeth River at Pegram, TN in Cheatham County - Jason Nelms

✦Rural and scenic Cheatham County, located adjacent to the growing metropolis of Nashville, created a Sustainable Tourism Plan by assessing its natural and cultural resources to highlight, among other values, its ecotourism potential (Tennessee Regions' Roundtable Network 2013).

2.1.6. Saving Species through Reintroductions

Species reintroductions occur both as a means of preventing listing under the Endangered Species Act and to bring back populations of rare species where they have declined or disappeared. Stocking programs in Tennessee are part of a long-term program designed to restore reproducing populations of native species to Tennessee waters.

Alligator Snapping Turtle

With weights often in excess of 50 pounds, the Alligator Snapping Turtle is credited as being the **largest freshwater turtle in North America**. In contrast to Common Snapping Turtles, Alligator Snapping Turtles are listed in Tennessee as In Need of Management and are illegal to take. The restoration program for this largely aquatic species involves the release of live Alligator Snapping turtles, both adults and juveniles, focusing on the major river systems in west Tennessee that drain directly into the Mississippi River (the Hatchie, Obion, Forked Deer, and Wolf).



Alligator Snapping Turtle - James St. John

Alligator Gar

Alligator Gar are large apex predators that have been **extirpated from parts of their range** throughout the lower Mississippi River and tributaries, as well as rivers flowing into the northern Gulf of Mexico. In Tennessee, they are listed as species In Need of Management. With a reputation that has been rehabilitated from "trash fish" to "sport fish," they are also increasingly popular among sportsmen. Thus, the goal of Tennessee's Alligator Gar management plan is to restore populations by stocking Alligator Gar within their historic range in west Tennessee in cooperation with the U.S. Fish and Wildlife Service and to establish a sport fishery when population abundance and structure allows (Todd 2005). From 2006 through 2015, TWRA stocked 51,238 alligator gar fingerlings in various rivers and oxbows in west Tennessee, primarily the Hatchie River – a program that continues today. Gar were hatched at Private John Allen National Fish Hatchery (NFH), then reared at Humboldt and Springfield State Fish Hatcheries, the TWRA Cumberland River Aquatics Center (C-RAC), Warm Springs NFH, Natchitoches NFH, and Mammoth Spring NFH.

Freshwater mussels

Tennessee has tremendously rich aquatic fauna, particularly when it comes to

freshwater mussels. Except for Alabama, the lakes, streams and rivers of **Tennessee once harbored the most diverse and abundant assemblage** of mussels known: 130 of 300 mussels species recorded in the country are or were known to occur here. However, mussels make up **almost half of the state's federally listed threatened and endangered species.** The current level of imperilment of Tennessee's mussel fauna adds greater importance to conservation efforts for species not yet designated in federal listings.

Mussels are important biological water filters for rivers, are used in research, and provide food for other wildlife. Their **shells are sought commercially** for nuclei used in the cultured pearl industry. The Tennessee Freshwater Mollusk Strategic Plan (Medlock et al. 2013) calls for the propagation and reintroduction of important mussel species into priority streams; this program has been augmented through SWG-funded equipment and facilities. An outstanding example is the C-RAC, a unique facility built with the partial support of SWG grants, the full dedication of TWRA staff, and partnerships with Tennessee Valley Authority (TVA) and the U.S. Army Corps of Engineers. The C-RAC focuses on propagation and reintroduction of aquatic species into the Cumberland River.

There are 11 rare mussel species housed at C-RAC, including the Tier 3 GCN species Pink Mucket, Orangefoot Pimpleback, Fanshell and Birdwing Pearly Mussel, along with 41 additional species that are not federally listed. Since the late 1990s, this facility has raised 18,000 endangered Pink Muckets from glochidia (the larval stage of mussels) as well as another 8,000 from 60 days old. It is also one of the few places in North America where a warm water discharge (from a nearby power plant) is used to help grow GCN species; the warm water provides an extended growing season, allowing greater growth of species prior to release time.





Left: Oyster Mussel traps fish host to deposit tiny young in fish gills to aid dispersal, Clinch River - Dave Herasimtschuk, Freshwaters Illustrated; Right: Wavy-rayed Lampmussel uses its lure to bring fish close, Clinch River - Jeffry Basinger, Freshwaters Illustrated





CHAPTER 3

SPECIES OF GREATEST CONSERVATION NEED AND PRIORITY HABITATS

3.1. Species Occurrence Records and the GCN Species List Review

A FUNDAMENTAL COMPONENT of developing conservation priorities is documenting current distributions of species and their habitats across the state, in particular, the designation of species of Greatest Conservation Need or "GCN species."

3.1.1. Updates to Species Occurrence Data in the SWAP Relational Database

During the creation of the first SWAP in 2005, the GIS relational database was designed to allow for continuous updates to species occurrence data gathered from a wide variety of data sources (TWRA 2005, p. 45). The Nature Conservancy has worked alongside the Tennessee Wildlife Resources Agency (TWRA) and other partners, including the Tennessee Department of Environment and Conservation (TDEC) Division of Natural Areas and the Tennessee Valley Authority (TVA) Heritage Program, to continually add to the datasets on known species distributions across the state.

Consistent data collection and assimilation work during the last decade has increased the number of species occurrence records available for use in the SWAP revision effort. Table 1 compares the differences in occurrence records available for planning in 2005 and 2015. In 2005, the database included approximately 25,000 aquatic, terrestrial and subterranean animal records, which has now been expanded to over 316,000 records. The records include an increase in the number of observations from cave

Photo credits: Conasauga Blue Burrower - Carl Williams, TWRA; Golden Eagle - Tony Hisgett; Gray Tree Frog - Dave Huth

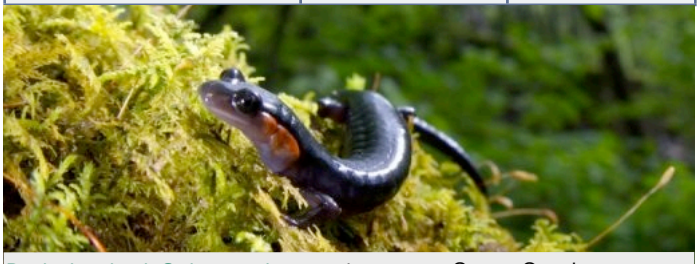
systems, with data from 300 more caves in 2015. An occurrence dataset of approximately 131,000 records for fish species known to be reproductive hosts for freshwater mussels was consolidated and added. Datasets of observational records for bird species have been improved, and the database now includes over 140,000 bird occurrences.

The increase in occurrence data for planning purposes in 2015 is attributable to three major opportunities: (1) better access to information housed in different data management systems, particularly **eBird** and TWRA's Aquatic Database System (TADS); (2) increase in occurrence records compiled in TDEC Division of Natural Areas and TVA Natural Heritage databases; and (3) increased levels of GCN species survey efforts and documentation conducted by TWRA and conservation partners. Table 2 provides a summary of the occurrence records now available for planning related to TWRA's improvements to data management and focused survey efforts, including over 2,700 records collected in the field by the nongame inventory program.

Finally, between 2005 and 2015, The Nature Conservancy worked with TDEC Natural Heritage program staff to add 568 plant species to the overall dataset. The addition of almost 10,000 plant species records increased the overall occurrence dataset available from 316,000 to approximately 326,000 records (Table 1). This collaborative effort allows for plant occurrence records to be utilized in a variety of ways including plant species-specific conservation planning, improved habitat distribution mapping of rare plant community types, and more comprehensive mapping of habitat priorities for plant and animal species combined. The availability of this data also provided the 2015 SWAP team with the option of identifying plants as GCNs if desired.

Table 1. **Comparison of species occurrence records available for planning in 2005 and in the 2015 revision process**

GCN group	2005	2015
Aquatic	5,268	149,224
Subterranean	961	7,000
Terrestrial	19,396	160,166
Plants	Not included	9,779
Total	**25,625**	**326,169**



Red-cheeked Salamander, endemic to Great Smoky Mountains National Park - Jeffrey Basinger, Freshwaters Illustrated

Table 2. **Summary of 2015 occurrence record availability from TWRA data management efforts and field surveys**

GCN group	Number of Occurrences (2015)
Aquatic	2,117
Subterranean	68
Terrestrial	16,566
Total	**18,751**



Large-leaved Grass-of-parnassus - "Eleanor"

3.1.2. Updates to the Species of Greatest Conservation Need List

The first major phase of the 2015 update focused on the review of the species of greatest conservation need (GCN) list. This process involved examining the 2005 GCN definition criteria; ensuring all species taxonomic names, conservation ranks, and legal designations are current; reviewing the full 2005 GCN species list by faunal group; and engagement with taxonomic field experts to ascertain that 2015 GCN selections align with current understandings of population status and the GCN definition criteria.

The core planning team determined that the overall GCN definition and selection rationale from 2005 was appropriate for the 2015 revision (TWRA 2005, p. 34). The three main elements include the species' global and state conservation status rankings, state and federal legal status designation, and additional rankings based on general population or habitat condition trends. Box 1 summarizes the definitions of global and state conservation ranks and Box 2 outlines the rationale for the selection of an individual species as a GCN in Tennessee.

Box 1. TDEC Natural Heritage Program global and state ranking system for species

Global Ranks:

G1 = critically imperiled globally; 5 or fewer occurrences worldwide imperiled globally

G2 = imperiled globally; 6 to 20 occurrences worldwide

G3 = very rare or restricted throughout range; 21 to 100 occurrences worldwide

G4 = apparently secure globally though locally rare sometimes; 100 to 1000 occurrences worldwide

G5 = demonstrably secure globally; over 1000 occurrences worldwide

G? = uncertain global rank

GH = historic global occurrence; possibly extinct

GNR = not ranked currently at global level

G#Q = questionable taxonomy

G#G# = mixed rank due to uncertainty

G#T# = rank of a subspecies or variety

State Ranks:

S1 = critically imperiled in state; 5 or fewer occurrences statewide

S2 = imperiled within state; 6 to 20 occurrences statewide

S3 = rare and uncommon in state; 21 to 100 occurrences statewide

S4 = apparently secure globally though locally rare sometimes; 100 to 1000 occurrences statewide

S5 = demonstrably widespread and secure in the state

S? = uncertain state rank

SH = historical occurrence in state

SNR = not ranked currently at state level

SP = potentially occurs in state

SR = reported to occur in state

SX = believed extirpated from state

S#S# = mixed rank due to uncertainty

(Note: additional global and state ranks are listed in this document, for more complete definitions please refer to the TN Division of Natural Areas' website at: **https://www.tn.gov/environment/section/natural-areas***)*

Beginning in October 2013 the planning team consulted taxonomic and field experts in mammals, birds, reptiles, amphibians, fish, mollusks, crustaceans, insects, and plants to finalize the updated 2015 GCN list. In November 2013, a species expert workshop was held to educate these experts about the 2015 update process and gather their feedback on GCN definition criteria, taxonomic accuracy, and choice of species for GCN designation. The planning team continued the consultation process through January 2014 to discuss the process with experts unable to attend the workshop and finalize choices.

Between 2005 and 2015, over 300,000 species occurrences were added to Tennessee's SWAP database, improving designation of GCN species and their priority habitats.

Box 2. Summary of rationales for selection and non-selection of GCN species

Rationale Categories for Selection as GCN Species

1. Globally rare, imperiled, or endangered species (G1-G3 NatureServe rank) or federal status category of LE (Listed Endangered), E/SA (Endangered by Similarity of Appearance), LT (Listed Threatened), T/SA (Threatened by Similarity of Appearance, PE (Proposed Endangered), PT (Proposed Threatened), or C (Candidate species); or state status category of E (Endangered), T (Threatened), or D (Deemed In Need of Management).
2. Special concern species due to declining trends, or otherwise vulnerable due to endemic, limited, disjunct, or peripheral status in region.
3. Special consideration wide-ranging species due to:
   a. **Partners in Flight** (PIF) score of 22 or higher
   b. National Shorebird Prioritization Score of 4 or higher
   c. National Wind Coordinating Collaborative category of 'High'
   d. Being a "keystone" species within a biodiversity "hotspot" or part of a globally significant aggregation of species
   e. Species is strongly dependent upon ecological processes often interrupted across the landscape.

Rationale Categories for Non-selection as GCN Species

1. Species occurs in the state but is not significantly imperiled, endangered, declining, or of special management concern.
2. Species range and/or habitat does not sufficiently occur in state to warrant target status.
3. Species is of uncertain taxonomic status.
4. Species is believed to be extinct range-wide.
5. Actively managed game species with sufficient number of viable populations in state.
6. Species is of historic significance but cannot currently be restored in the state.
7. Species distribution in habitats in state is either unknown or too uncertain to warrant target status.



Green Anole, example of a common, non-GCN species - Hunter Desportes

Plants as GCN species



Participants in the SWAP Species Experts Workshop held November 2013 to assist in updating the Species of Greatest Conservation Need List - Chris Simpson, TWRA

In consultation with scientific experts, the core planning team made the determination to grant 568 plant species GCN status in 2015. Plant species were not assigned GCN status during the 2005 planning effort. The decision to assign plants GCN status is consistent with the AFWA 2012 Best Practices Guidance, the recommendations of a NatureServe review of the role of plants in State Wildlife Action Plans (Stein and Gravuer 2008), as well as **the choice of 16 other states** which either selected plants as GCNs in 2005 or have added them since that time. States have chosen to add plants for a variety of reasons including a desire to help prevent federal listings of a greater spectrum of species, to collaborate with additional partners whose focus is on plant conservation, to garner additional funding for overall conservation efforts, and to help ensure that their SWAP is as comprehensive a conservation blueprint as possible for their states. (AFWA 2012).


GCN plant species clockwise from top left: Purple Milkweed - Katja Schulz; American Chestnut - Nicholas A. Tonelli; Clinton's Lily - Superior National Forest; Pink Lady's-slipper - Liz West

In addition, wild flora share many of the same management issues as wild fauna. Many of the same factors causing broad declines in the nation's wild animals – habitat destruction

or alteration, spread of invasive alien species, emergence of lethal diseases, and increasingly, shifts in climate – all are taking a toll on the nation's plant life. Because many rare plants are highly localized, growing only in very specific soils or micro-climates, they are particularly susceptible to local habitat disturbances and direct damage to individuals and populations.

Of Tennessee's 2,395 plant species, 6.3% are at risk, making Tennessee the 19th-ranked state for plant species at risk. Without focused conservation attention to the growing plight of plant species, Tennessee could lose significant portions of its wild heritage and the ecological resilience that comes with that diversity (Stein and Gravuer 2008).

Tier Status

The Congressional mandate to states regarding the creation of State Wildlife Action Plans is to invest in conservation activities that assist in the prevention of future federal listings (e.g. Federally Endangered or Federally Threatened). Different state agencies also maintain separate jurisdictional authorities over species and habitat management. For these reasons, the 2005 SWAP designated "tiers" to track the legal status and jurisdictional authorities associated with all GCN species (TWRA 2005, p. 43). The 2015 core planning team decided to maintain the original tier designation system and add a fourth tier for plants. Box 3 summarizes the definitions of each tier designation.

Including the tier status in the SWAP relational database/ GIS system allows planners to efficiently determine which species may be appropriate for different types of

Box 3. Summary of tier designations for GCN species

Tier 1: Species defined as wildlife under Tennessee Code Annotated 70-8-101, (i.e., amphibians, birds, fish, mammals, reptiles, crustaceans & mollusks), excluding federally listed and game species

Tier 2: All other fauna not defined as wildlife under Tennessee law (i.e., insects and other invertebrates)

Tier 3: Federally listed or game species which have alternative conservation funding

Tier 4: Plant species of Greatest Conservation Need



Examples of Tier 1-4 species, clockwise from top left: Tier 1: Mud Salamander - Chris Simpson, TWRA; Tier 2: Diana Fritillary - Pondhawk; Tier 3: Pallid Sturgeon (with children) - Scott Mensing, U.S. Army Corps of Engineers; Tier 4: Canada Anemone (*Anemone canadensis*) - Superior National Forest

conservation project funding and which species are covered by various regulatory and management jurisdictions. TWRA does not have legal responsibility for rare plant species conservation, but wishes to track and incorporate the management needs of plants whenever feasible in ongoing conservation activities, particularly with respect to habitat protection and restoration for a broad suite of species.

The 2005 SWAP identified 664 aquatic, terrestrial, and subterranean GCN species in Tennessee. With the addition of plants as Tier 4 GCNs and the changes made to selections in other species groups, the number of GCNs for Tennessee in 2015 is now 1,499. Table 3 summarizes the changes made to the GCN list between 2005 and 2015. Appendix C provides the full updated list of 2015 GCN species including information on their state and global conservation ranking status, state and federal legal status, and tier designation.

Table 3. Comparison of GCN species designations between 2005 and 2015

	Number of GCN Species	
	2005	2015
Aquatic	246	276
Subterranean	185	411
Terrestrial	233	244
Plants	0	568
Total	664	1,499



GCN species clockwise from upper left: Aquatic: Chickamauga Crayfish - Carl Williams; Subterranean: Virginia Big-eared Bat - USFWS; Terrestrial: Red Squirrel - Giles Gonthier; Plant: Wood Lily - Jay Sturner

3.2. A Strategic Focus on Habitat Conservation

Habitat Prioritization Process Summary

In summary, the 2015 process for prioritizing habitats according to their importance for GCN species included the following steps:

1. **Terrestrial Habitat Mapping:** Utilize the most recent Southeast Gap Analysis Project's (SEGAP) landcover mapping (2001), which includes NatureServe's ecological system classification framework, to map habitat types for GCN species.
2. **Updates to mapping units:** Revise both terrestrial and aquatic mapping units to provide units of analysis that are more consistent statewide as well as smaller and more refined, allowing for even aggregation and disaggregation of data outputs when determining priorities, performing subsequent analyses on problems affecting habitats, and goal setting.
3. **Modeling and prioritizing habitat used by species:** As in 2005, this process combines 3 steps to develop overall habitat priority designations: identifying habitats preferred by each species, rating GCN species priority, and modeling actual habitat occupancy on the basis of species data records.
    - Assign habitat preferences for all terrestrial GCN species to NatureServe ecological systems (adding newly designated GCN species including GCN plants) on the basis of expert opinion. All terrestrial GCN plant and animal species now have habitat preference ratings for every natural ecological system in the GIS database.
    - Develop scores rating the priority of GCN species using data indicating how recently species were recorded in each location, combined with species rarity designations. Scores are designed to capture the species' rarity, likely persistence at or near a specific location, and the quality of the population when that information is available.
    - Use individual species occurrence observations as the beginning point for mapping habitat occupancy, then combine this with information that recognizes inherent differences in species' dispersal (movement) abilities to calculate a species habitat "footprint."
4. **Generating priority habitat maps**: Finally, combine the GCN prioritization scores with the species distribution footprints using the appropriate, updated mapping units and for terrestrial species, their habitat preference scores. Calculate ranks of low, medium, high, and very high priority habitats separately for each major type (terrestrial, aquatic, and subterranean) in each region of the state because some regions have higher concentrations of imperiled species. Compared to a single scoring standard, this method more fully captures all habitat priorities statewide.

The following discussion gives a high level overview of the major improvements to spatial datasets and habitat prioritization scoring methodologies employed during the 2015 update. These changes, combined with the significant addition of species records to the database, have improved the resolution of the data and

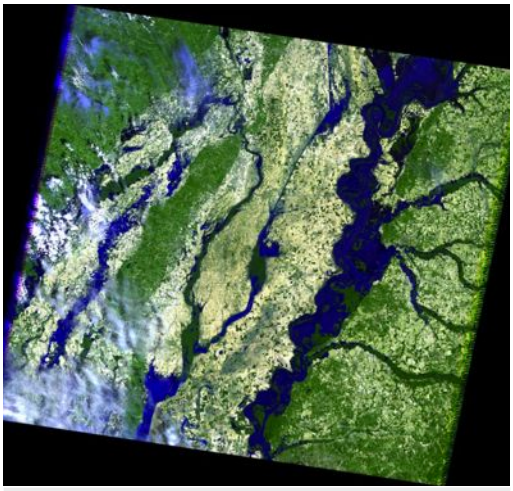
Improvements to 2015 spatial datasets and prioritization methods have increased both resolution of the data and flexibility of analyses possible at different spatial scales.

created the opportunity for more flexible applications of the outputs for use in a greater variety of subsequent analyses, decision-making contexts, and collaborations at different spatial scales. The Nature Conservancy (TNC) developed a companion GIS revision report to this 2015 SWAP to provide detailed information on all spatial data, methods, and formulas used to identify GCN species habitat priorities (Wisby and Palmer 2015).

3.2.1. Standardized Habitat Classification

The 2005 SWAP effort provided a major advance in statewide conservation planning through the intentional use of standardized habitat classification units and linking GCN species habitat preferences to those habitats. The emphasis on habitat classification and mapping improved the ability of conservation partners to make collaborative investments in habitat restoration and protection in all regions of the state. This success encouraged TWRA to adopt the same terrestrial habitat classification approach in the agency's 2014-2020 Strategic Plan (TWRA 2014).

In its 2014-2020 Strategic Plan, TWRA emphasizes the importance of a habitat-based approach to management, since habitat is the cornerstone of providing healthy populations of animals. "Provided that public and private lands and waters can provide ample quality habitat, species should be self-supporting if given the proper protection" (TWRA 2014). **The Strategic Plan** is now organized around broad habitat types generally corresponding to those used in the 2005 SWAP: Grassland, Forestland, Wetland, Karst, Streams and Rivers (TWRA 2014). The Strategic Plan also includes reservoir impoundments and urban areas as important wildlife management areas for fisheries and other habitat values.



Landsat 5 image, Flooding along the Mississippi (TN, AR, KY, MO) May 10, 2011

The 2015 SWAP update uses the same basic terrestrial habitat classification scheme developed in 2005. In the 2005 SWAP, the team used the Tennessee Gap Analysis Project's (SEGAP) landcover mapping, derived from 1990-1993 Landsat Thematic Mapper satellite imagery, as the base map of vegetation types and cross-walked the land cover classes to NatureServe's ecological systems (TWRA 2005, p. 61). The NatureServe ecological systems then served as the habitat types for terrestrial species. The 2015 update uses more recent 2001 SEGAP landcover mapping, which uses the NatureServe ecological systems as its classification framework. The NatureServe ecological systems are again used as the terrestrial habitat types.

The 2001 SEGAP land cover classification remains the most comprehensive map of vegetation cover by ecological systems for the state. Appendix D provides a summary of the SWAP habitat classification hierarchy, including information on the distribution of habitat types by ecoregion.

For freshwater systems, the planning team made no changes to the ecological drainage unit and stream classification system adopted in 2005 (Smith et al. 2002). The U.S. Fish and Wildlife Service's Appalachian Landscape Conservation Cooperative is developing an updated classification scheme for rivers and

streams that was not yet available during the current planning horizon. In addition, a general physiographic scheme was used to classify karst systems (TWRA 2005, p. 8).

3.2.2. GCN Species Habitat Preferences

Following the selection of the habitat classification systems, the 2005 team used a process of expert-derived habitat preference assignments for terrestrial GCN species (TWRA 2005, p. 65). For every natural ecological system within each separate ecoregion, the planning team assigned a habitat preference rating for each species of "preferred," "suitable," "marginal," or "unsuitable."

The preference ratings are intended to categorize the relative utility of one ecological system type as habitat over another for each terrestrial species. For aquatic species, the occurrence record locations for GCNs were intersected in the SWAP GIS relational database with the freshwater classification designation of stream types, and these assignments were reviewed by the planning team (TWRA 2005, p. 65). No expert-derived preference assignments were made for subterranean species in 2005 due to lack of a consistent habitat classification for karst systems.

After completing the revision of the GCN species list, the 2015 planning team used the same process for assigning habitat preferences to all newly-designated terrestrial and freshwater GCNs. An interim project by TWRA, TNC, and Tennessee Department of Environment and Conservation (TDEC) Division of Natural Areas staff between 2005 and the 2015 comprehensive update process assigned karst preference ratings of trogloxene, troglophile, or troglobite (increasing degrees of dependence on cave environments) to all subterranean species based on their biological needs. These karst preference assignments were also maintained by the 2015 planning team.

The 2005 planning effort did not incorporate plant species, as no plants were designated GCN. However, during a project completed in 2009, TDEC Division of Natural Areas plant experts worked with TNC to make similar terrestrial habitat assignments for all plant species now included in the SWAP database. All terrestrial GCN plant and animal species now have habitat preference ratings for every natural ecological system in the 2001 SEGAP data. Appendix D provides an extensive summary of all 2015 GCN species and their habitat type preferences by ecoregion.



Top to bottom: Trogloxene: Northern Long-eared Bat - John Lamb; Troglophile: Cave Salamander - Dustin Thames; Troglobite: Tennessee Cave Salamander - Matthew Niemiller

In subsequent phases of priority habitat mapping in 2005 and 2015, aquatic habitat mapping did not use

the preference assignments in the database. This choice was made due to the complexity of mapping the range of different aquatic system stream types in conjunction with the expert-derived preference assignments.

For use in the GIS mapping, the planning team assigned weights to terrestrial habitat preference ratings. In the 2005 model, these values were 10 points for preferred, 7 points for suitable and 3 points for marginal habitat designations. In the 2015 iteration, in order to emphasize the footprint of preferred habitats in the final mapping schemes, the ratings used are 10 points for preferred, 5 points for suitable, and 2 points for marginal habitats (Wisby and Palmer 2015). Finally, the 2015 model uses the karst preference ratings for each subterranean species as a scoring mechanism to capture the reliance of those species on karst habitats.

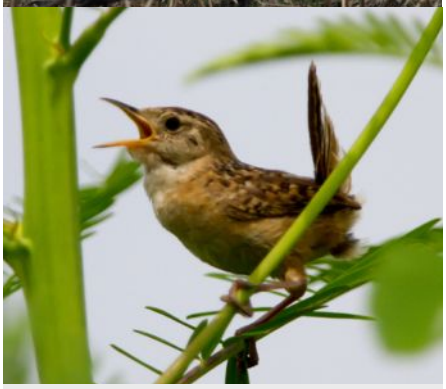
3.2.3. GCN Species Prioritization Scoring

In 2005 the planning team developed a prioritization scoring formula for GCN species using a combination of species rarity information and the presumed viability of a given species population (TWRA 2005, p. 80). The 2015 species prioritization scoring formula has been modified in two ways: (1) to reduce the complexity from the 2005 methods attempting to estimate population viability as a scoring component; and (2) to include federal and state legal listing status.

Specifically, as a substitute for a population viability rating estimate, the prioritization formula now uses a scaled point score associated with the date of last observation for every species occurrence (i.e., observation) record and the **NatureServe Element Occurrence Ranking score**, when available. In the scaled scoring system, occurrences with more recent observation dates are given more points, with the points tapering down for older records and records without dates receiving a nominal score of 20 out of 100 points. These two scoring elements represent the likelihood of a species' current persistence at or near the observation point and the quality of the population. The rarity portion of the species priority score, originally restricted to Global and State ranks (see Box 1, p. 26), has been amended to include federal and state legal listing status to account for potentially declining population trends triggering a legal status assignment (Tables 4 and 5). These trends may not be reflected in the Global or State rarity ranks alone (Wisby and Palmer 2015).

Species priority ratings of karst species and their occurrences are based only on NatureServe G-Ranks, when available, and on estimates of probable G-Rank designation for species not in the NatureServe database. These choices for





Top: Whooping Crane (G1 species) - Cynthia Routledge; Sedge Wren (G5 species) - Chris Sloan

Table 4. Federal species listing designations

Abbreviation	Designation	Explanation
LE	Listed Endangered	Taxon is threatened by extinction throughout all or a significant portion of its range
SAE	Endangered by Similarity of Appearance	Taxon is treated as an endangered species because it may not be easily distinguished from a listed species
LT	Listed Threatened	Taxon is likely to become an endangered species in the foreseeable future
SAT	Threatened by Similarity of Appearance	Taxon is treated as a threatened species because it may not be easily distinguished from a listed species
PE	Proposed Endangered	Taxon proposed for listing as endangered
PT	Proposed Threatened	Taxon proposed for listing as threatened
C	Candidate species***	Taxon for which the USFWS has sufficient information to support proposals to list the species as threatened or endangered, and for which the Service anticipates a listing proposal
(status, XN)	Nonessential experimental population in portion of range	Taxon which has been introduced or re-introduced in an area from which it has been extirpated, and for which certain provisions of the Act may not apply
PXN	Proposed nonessential experimental population	

*** Taxa listed as candidate species may be added to the list of Endangered and Threatened species, and as such, consideration should be given to them in environmental planning. Taxa listed as LE, LT, PE, and PT must be given consideration in environmental planning involving federal funds, lands, or permits, and should be given consideration in all non-federal activities.

Table 5. State species listing designations

Abbreviation	Designation	Explanation
E	Endangered	Any species or subspecies whose prospects of survival or recruitment within the state are in jeopardy or are likely to become so within the foreseeable future
T	Threatened	Any species or subspecies that is likely to become an endangered species within the foreseeable future
D	Deemed in Need of Management	Any species or subspecies of nongame wildlife which the executive director of the TWRA believes should be investigated in order to develop information relating to populations, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully. This category is analogous to "Special Concern."
S	Special Concern	Any species or subspecies of plant that is uncommon in Tennessee, or has unique or highly specific habitat requirements or scientific value and therefore requires careful monitoring of its status.

Table 5. State species listing designations, additional modifiers for plants

Abbreviation	Designation	Explanation
PE	Proposed Endangered	Any species or subspecies of plant nominated by the Scientific Advisory Committee to be added to the list of Tennessee's endangered species. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State endangered.
PT	Proposed Threatened	Any species or subspecies of a plant nominated by the Scientific Advisory Committee to be added to the list of Tennessee threatened species. After a public hearing, these plants will formally become State threatened.
E-PT	Endangered-Proposed Threatened	Species which are currently on the state list of endangered plants, but are proposed by the Scientific Advisory Committee to be down- listed to threatened. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State threatened.
E-PS	Endangered-Proposed Special Concern	Species which are currently on the state list of endangered plants, but are proposed by the Scientific Advisory Committee to be down- listed to special concern. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State special concern.
T-PE	Threatened-Proposed Endangered	Species which are currently on the state list of threatened plants, but are proposed by the Scientific Advisory Committee to be listed on the state endangered list. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State endangered.
T-PS	Threatened-Proposed Special Concern	Species which are currently on the state list of threatened plants, but are proposed by the Scientific Advisory Committee to be down- listed to special concern. After a public hearing, these plants will formally become State special concern.
P	Possibly Extirpated	Species or subspecies that have not been seen in Tennessee for the past 20 years. May no longer occur in Tennessee.
C	Commercially Exploited	Due to large numbers being taken from the wild and propagation or cultivation insufficient to meet market demand. These plants are of long-term conservation concern, but the Division of Natural Heritage does not recommend they be included in the normal environmental review process.

karst species ratings were made because knowledge of karst biodiversity, while improving, still remains limited and many species have not been assessed for Global or State rarity ranking or State and Federal legal status.

3.2.4. 2015 Updates to Habitat Mapping Units

Terrestrial Habitats

The 2005 habitat mapping effort used products from the U.S. Census Topologically Integrated Geographic Encoding and Referencing (TIGER) database of roads to segment Tennessee's terrestrial landscape into roadless block sections. These roadless block areas were used as the smaller grain-sized land unit basis to assess priorities. For the 2015 update, the roadless block units have been replaced by uniform 100-acre hexagons statewide, subsequently grouped into 700-acre rosettes for terrestrial habitat prioritization. The full land area of Tennessee contains approximately 40,000 700-acre rosette clusters.

The 100-acre hexagon framework was also used to link cave sites (subterranean habitat) to the surrounding terrestrial landscapes in which they are located for further assessment (Table 6).



Woodland at Catoosa WMA - Clarence Coffey, TWRA (retired)

Roadless block areas vary in size and shape and have an inconsistent footprint on the landscape. The standardized, regular hexagon grain size approach is preferable for organizing prioritization assessments because it is consistent statewide and allows for even aggregation and disaggregation of data outputs when determining priorities. Also, the hexagon approach is not related to or dependent upon political or management jurisdictional boundaries, and instead can be used to examine data in a flexible manner within the context of these other boundaries when needed (Nhancale and Smith 2011).

Aquatic habitats

The 2005 version of the SWAP aquatic datasets used 12-digit hydrologic units (HUC12) as the units of analysis. Since its initial development, the aquatic component of the database has also been extensively revised and refined by TNC. The 2015 SWAP update uses this new hydrological modeling framework developed by TNC in a Microsoft Access platform using the National Hydrography Plus (NHDPlus v2) datasets from the U.S. Geological Survey and the U.S. Environmental Protection Agency (Table 6).

Built upon the 1:100,000-scale National Hydrography Dataset and 1:24,000-scale digital elevation models (DEM), NHDPlus v2 defines the catchment areas draining into each individual stream segment in a hydrologic



Estill Fork at Bear Hollow Mountain WMA, third order stream - Josh Campbell, TWRA

network. The NHDPlus v2 dataset also defines the hydrologic upstream and downstream connections between individual stream segments, as well as providing a number of other relevant attributes, such as mean annual flow velocities and volumes. Dam locations and GIS attributions from the National Inventory of Dams (NID) dataset were also incorporated. Dams determined to be on the stream network were linked to their corresponding NHDPlus v2 stream segments for incorporation into the model. Normal storage values from NID data, as well as NHDPlus v2 flow volumes at linked stream segments, were used to estimate mean annual residence time of water behind dam impoundments.

The 2015 updates to the SWAP aquatic datasets provide several advantages in both the assessment of habitat priorities and the understanding of problems affecting these habitats. The grain size of the catchment areas around stream segments are much smaller and more refined than the HUC12 grain size, and the catchments and segments can be aggregated and disaggregated at different watershed spatial scales as needed. The catchment and stream segment connections also allow for assessments of land use and land cover conditions known to be related to stream health and overall habitat integrity. Finally, the upstream and downstream hydrologic connections provide a general means of understanding the linkages between upstream land and water uses on downstream sections of streams and rivers.

3.2.5. 2015 Updates to Species Distribution Footprints

The 2005 SWAP model used the individual species occurrence observation points as the basis for mapping the potential occupancy footprint of a species at a given location. For terrestrial species in 2005, occurrences inside one NatureServe "suitable habitat separation distance" (Box 4) were combined into one observation. For aquatic species, any occurrences of a

Table 6. Comparison of 2005 and 2015 mapping units

General Habitat Category	2005 Base Mapping Unit	2015 Base Mapping Unit
Terrestrial	TIGER-roadless blocks	100-acre hexagons, aggregated to 700-acre rosettes
Aquatic	12-digit Hydrologic Unit Code (HUC) watersheds	National Hydrography Dataset Plus, Version 2 catchments
Subterranean	Tiger-roadless blocks	100-acre hexagons, aggregated to 700-acre rosettes

Box 4. Separation Distance for Suitable Habitat

Distance (in kilometers) of intervening suitable habitat not known to be occupied that is great enough to effectively separate occurrences by limiting movement or dispersal of individuals between them. Suitable habitat is habitat capable of supporting reproduction or used regularly for feeding or other essential life history functions; a habitat in which you would expect to find the species (assuming appropriate season and conditions). For most animal species, the recommended minimum separation distance for intervening suitable habitat is 2 km (1.2 mi). This is to ensure that occurrences are not separated by unreasonably small distances, which would lead to the identification of unnecessarily fragmented populations as potential targets for conservation planning or action. Note: The separation distances for animals are currently under review and subject to revision. (Definition from NatureServe)

species within a HUC12 watershed were combined to represent one observation. Subterranean species occurrences were linked to their known cave sites, and similar to aquatics, all occurrences were combined into one observation point for that species in that cave system (TWRA 2005).

The 2015 update also uses individual species occurrence observations as the beginning point for mapping occupancy. A few key modifications recognize the limitations inherent in using observations based on general field surveys designed primarily to document species presence only, without recording absence where a species might be expected to occur. In addition, the hexagon framework and NHDPlus v2 updated base mapping units allow for greater flexibility in examining potential species distributions than the roadless block and larger HUC12 watershed approach.

First, for terrestrial species, potential distribution footprints from every individual species observation point were modeled to the 700-acre rosettes using a formula which takes into consideration the age in years of the observation point and the distance of the point to each 700-acre rosette as a percentage of 4 times the NatureServe suitable habitat separation distance of the species, with maximum distance/viability score combinations selected for each species/rosette pair (Wisby and Palmer 2015).

For aquatic species, the NHDPlus v2 stream segments were linked with each individual species observation. Then, stream segments upstream and downstream of the observation point within 2 times the NatureServe suitable habitat separation distance (Box 4) and with similar mean annual flow volumes to the flows at the observation point were identified to capture the potential distribution footprint of the species in a given collection of stream segments. The planning team considered NID dam locations to be barriers in the footprint development and these were not crossed when mapping potential species occurrence extents (Wisby and Palmer 2015).

Finally, for subterranean species, the 2015 model assigns all observation records to the cave system from which they are documented, duplicate occurrence records are removed, and one unique species/cave system observation developed. Using the 100-acre hexagon units of analysis, the planning team identified areas around all cave system entrances as habitat influencing subterranean species based on their distance to cave systems with documented GCN species.



"Douglas Dam - Tennessee 001," on the French Broad River - TVA Web Team, Wikimedia Commons

For species known to occupy dry zones in caves, a maximum distance of 2.5km was used, and for bats and karst species known to occupy cave streams and pools, a maximum distance of 5km was used. These distances were utilized to capture a general footprint of the organic recharge zone of each cave (2.5km or 1.5 mi) and to reflect the higher mobility and potential hydrologic recharge zone of bats and cave-stream dependent species,

respectively (Wisby and Palmer 2015). Bat species are the only faunal group associated with cave systems for which the date of occurrence observation was considered in the scoring system for subterranean priorities (Wisby and Palmer 2015).

3.2.6. Mapping Terrestrial, Aquatic, and Subterranean Priority Habitats

The final steps in the generation of priority maps involved combining the GCN prioritization scores with the species distribution footprints using the appropriate mapping unit framework – hexagons for subterranean and terrestrial, NHDPlus v2 stream segments for aquatics (for detailed scoring formulas, see Wisby and Palmer 2015). This mapping process allows for each major habitat category (terrestrial, aquatic, and subterranean) to be assessed using its individual scoring and footprint methodology, but also to combine the assessments into different types of visual map and tabular outputs for interpretation.

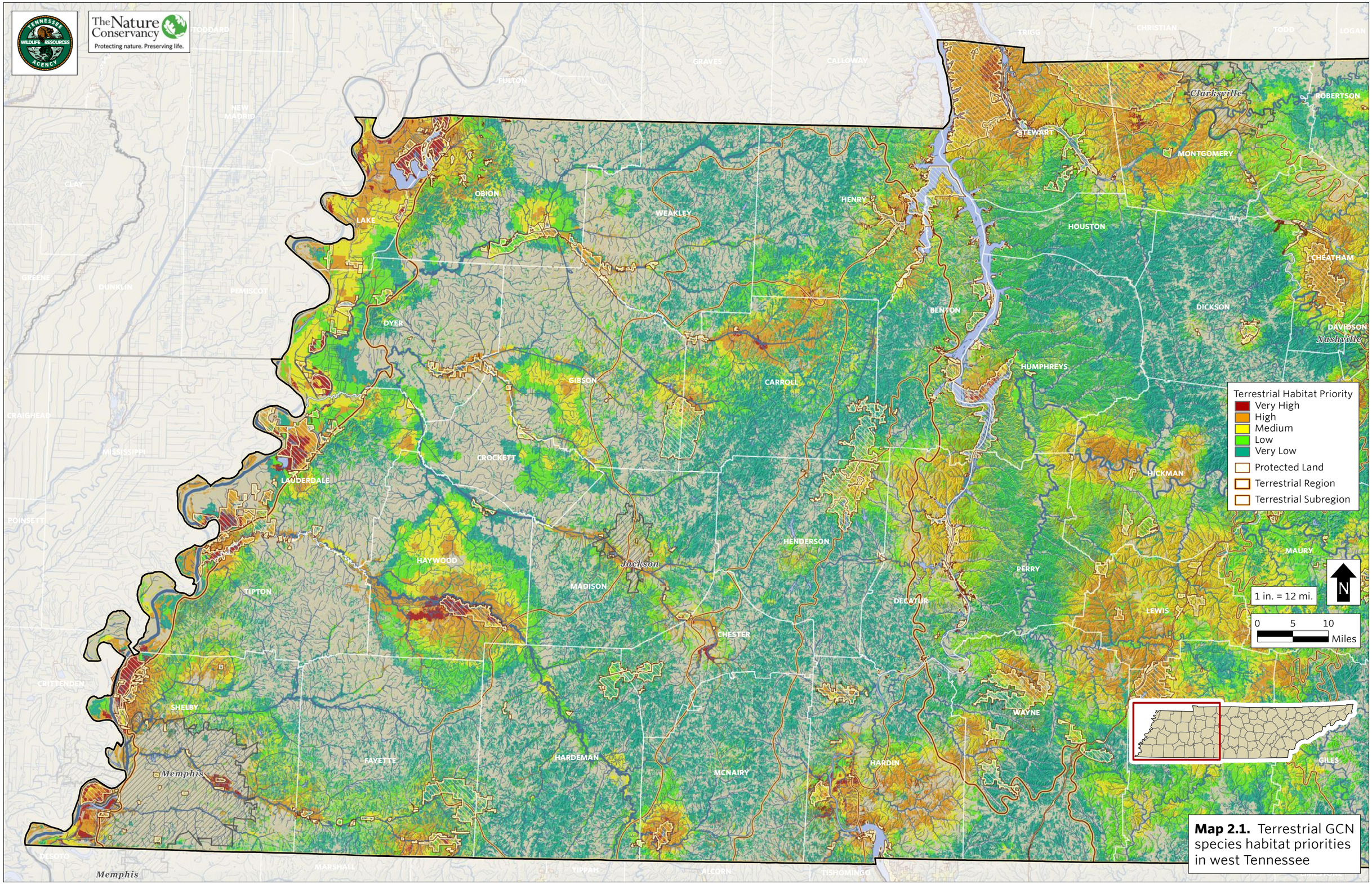
For terrestrial species, the planning team used the habitat preference scores for NatureServe ecological systems and the SEGAP landcover mapping of those systems in the final mapping process. They overlaid the SEGAP ecological system coverage with the 700-acre rosettes statewide, resulting in a GIS layer with roughly 400,000 ecological system class/rosette combinations. They then joined the terrestrial species distribution footprints (by 700-acre rosette) data table to the ecological system class/ rosette table. Final priority scores for ecological systems (habitats) within each rosette were calculated by summing the GCN species prioritization, observation age and distance, and habitat preference scores for all species within the rosette (Wisby and Palmer 2015).

A similar calculation process was performed to generate aquatic habitat priority maps by summing the GCN prioritization, observation age, and distribution footprint of every species for each stream segment. The planning team identified cave system priorities based on the GCN species global rarity and karst affinity score, with scores for known bat caves and areas within a 2.5 km radius receiving an additional score component based on the age of the observation record (Wisby and Palmer 2015).

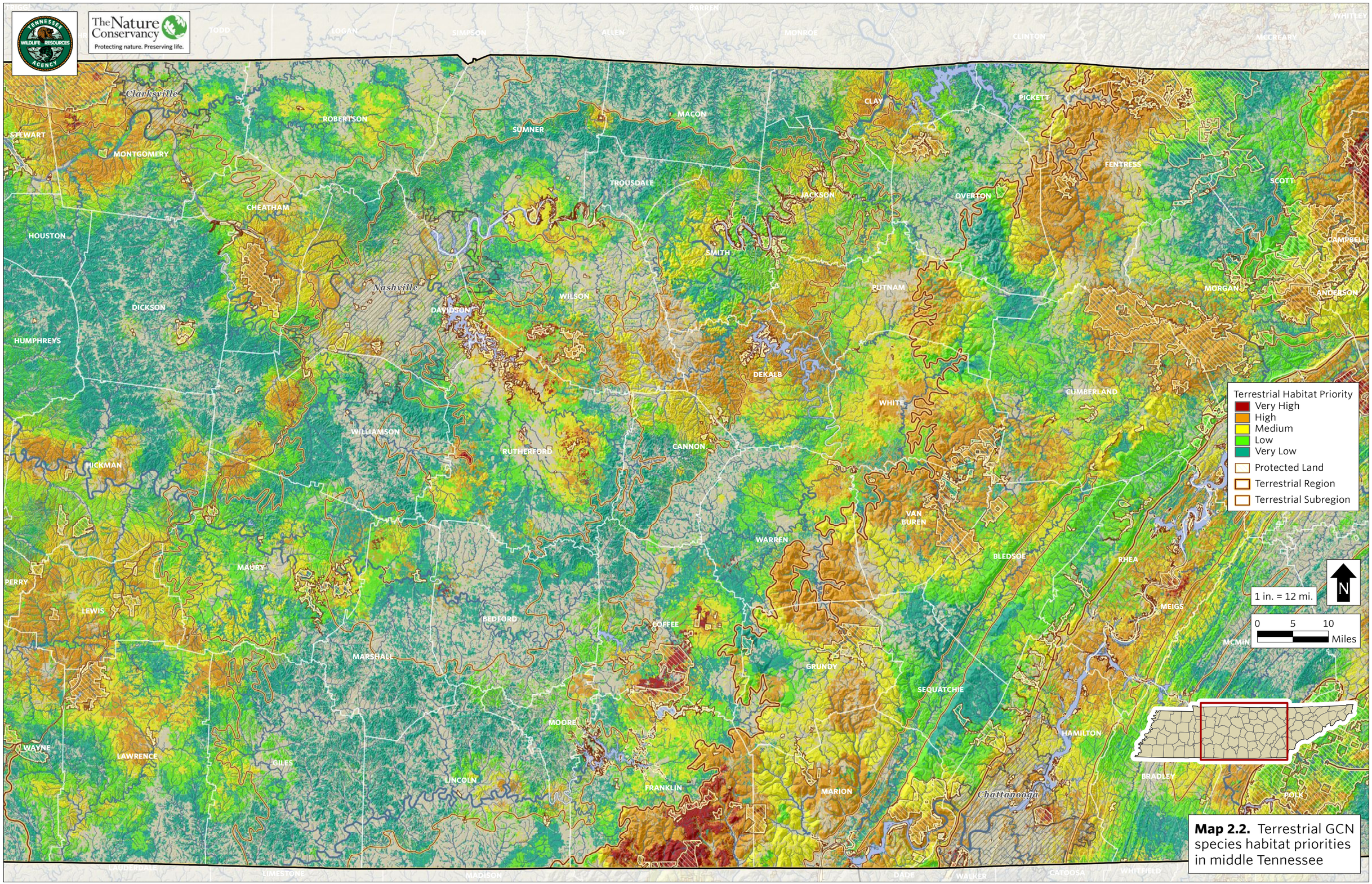
The 2005 plan used a scaled system categorizing the final habitat priority scores into low, medium, high, and very high for each major habitat, with the categorization performed independently for each terrestrial ecoregion, aquatic region, and subterranean region respectively (TWRA 2005, p. 83). Because some regions of the state have higher concentrations of imperiled species, a single scoring standard for mapping habitat priorities would not capture all habitat priorities statewide. The 2015 update uses a similar low, medium, high, and very high categorization for the priority scores. The mapping approach again is stratified by terrestrial ecoregion, aquatic region, and subterranean regions to capture representation of all GCN species and their priority habitats statewide.

3.2.7. 2015 Statewide Habitat Priority Maps

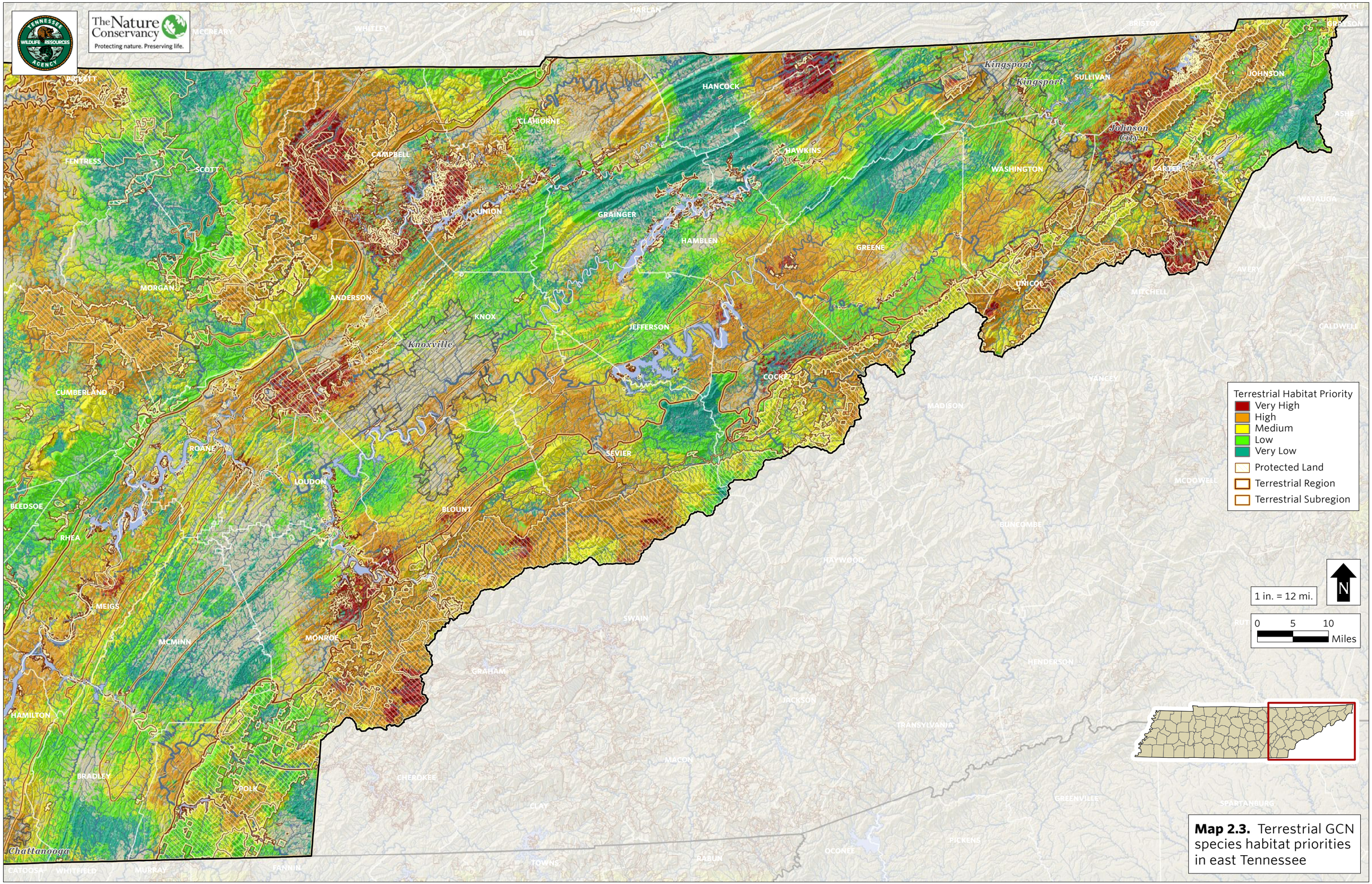
Maps of priority habitats for terrestrial, aquatic, and subterranean GCN species as well as all priority habitats combined follow.



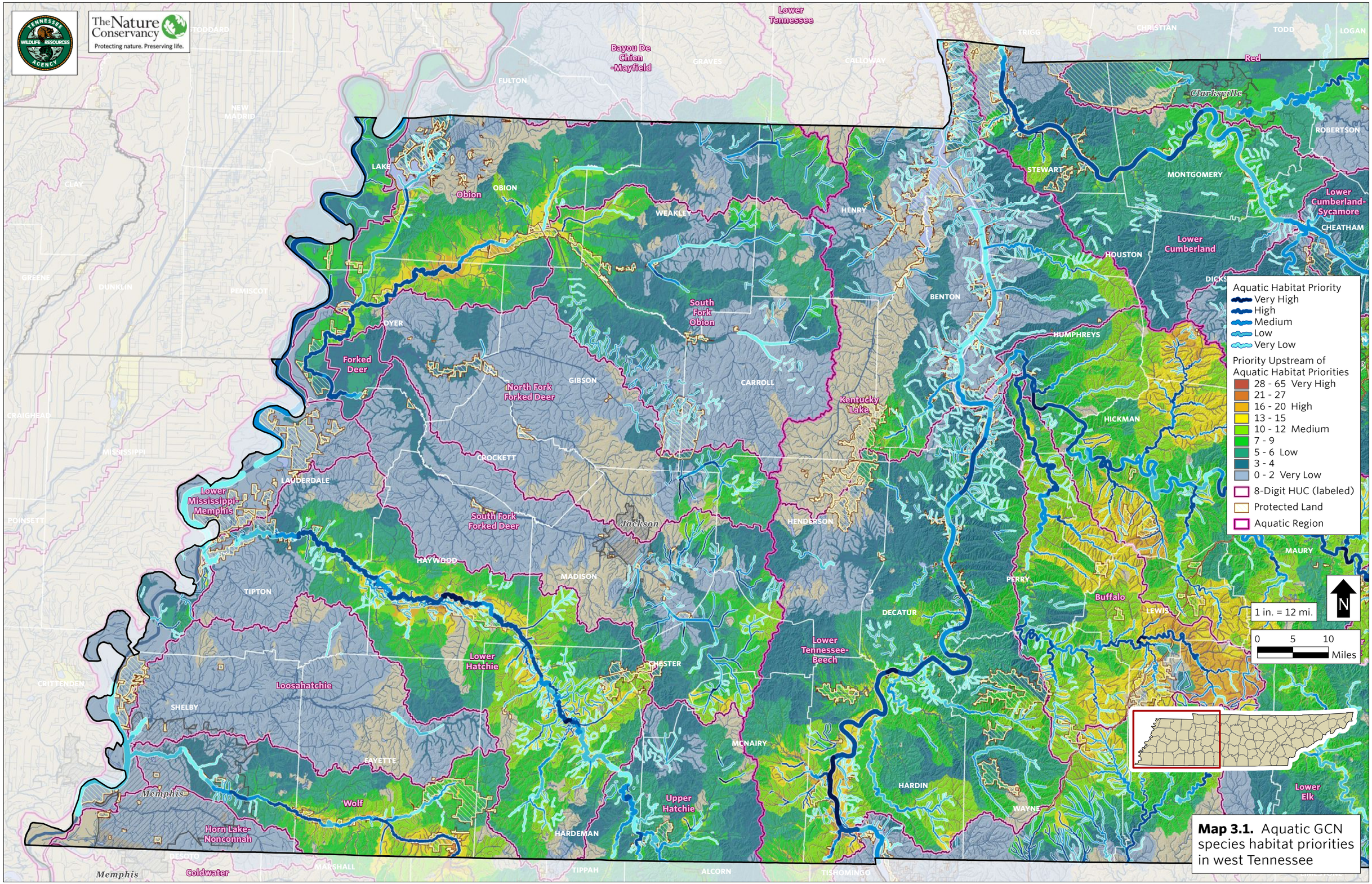
Map 2.1. Terrestrial GCN species habitat priorities in west Tennessee



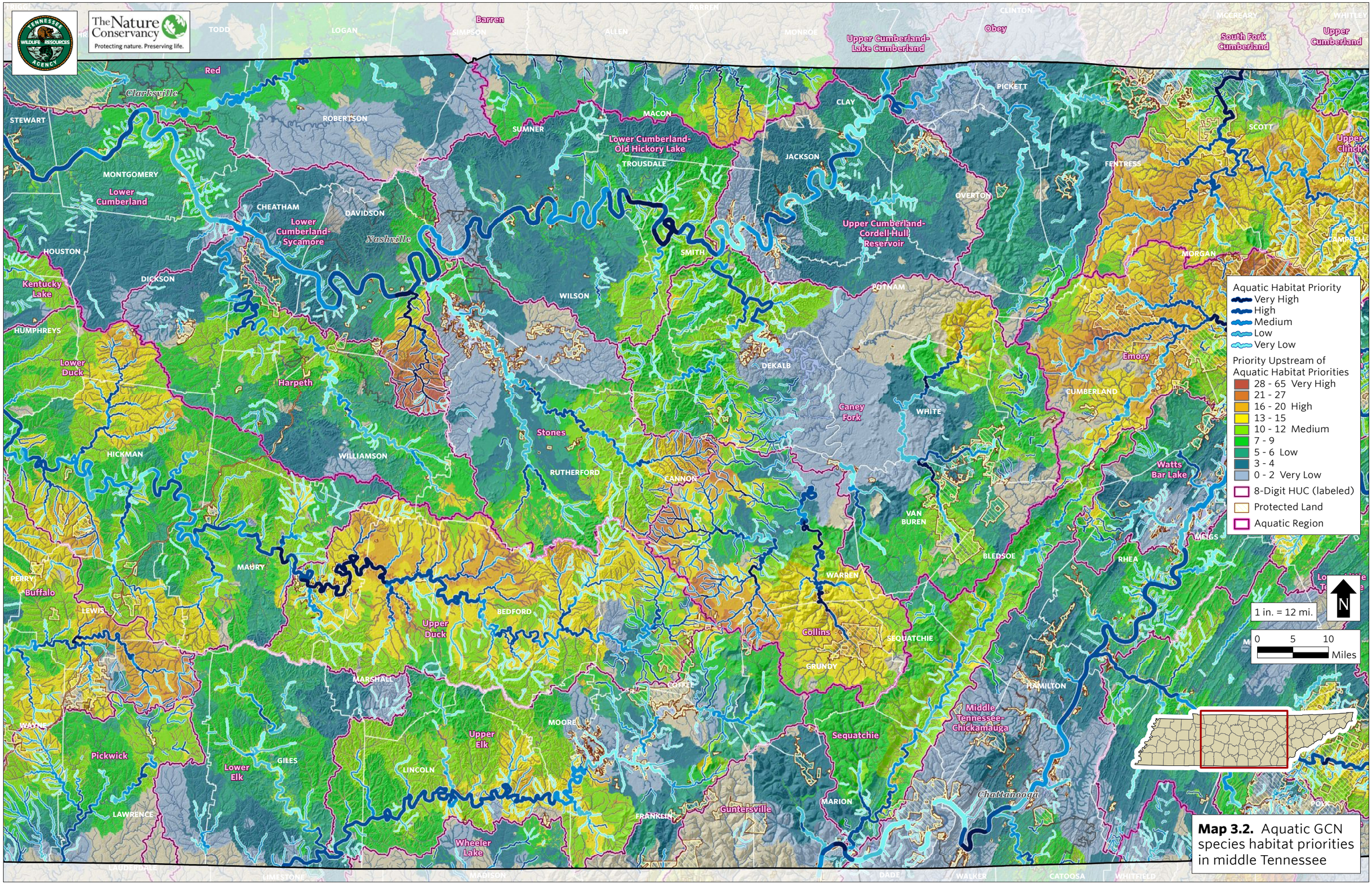
Map 2.2. Terrestrial GCN species habitat priorities in middle Tennessee



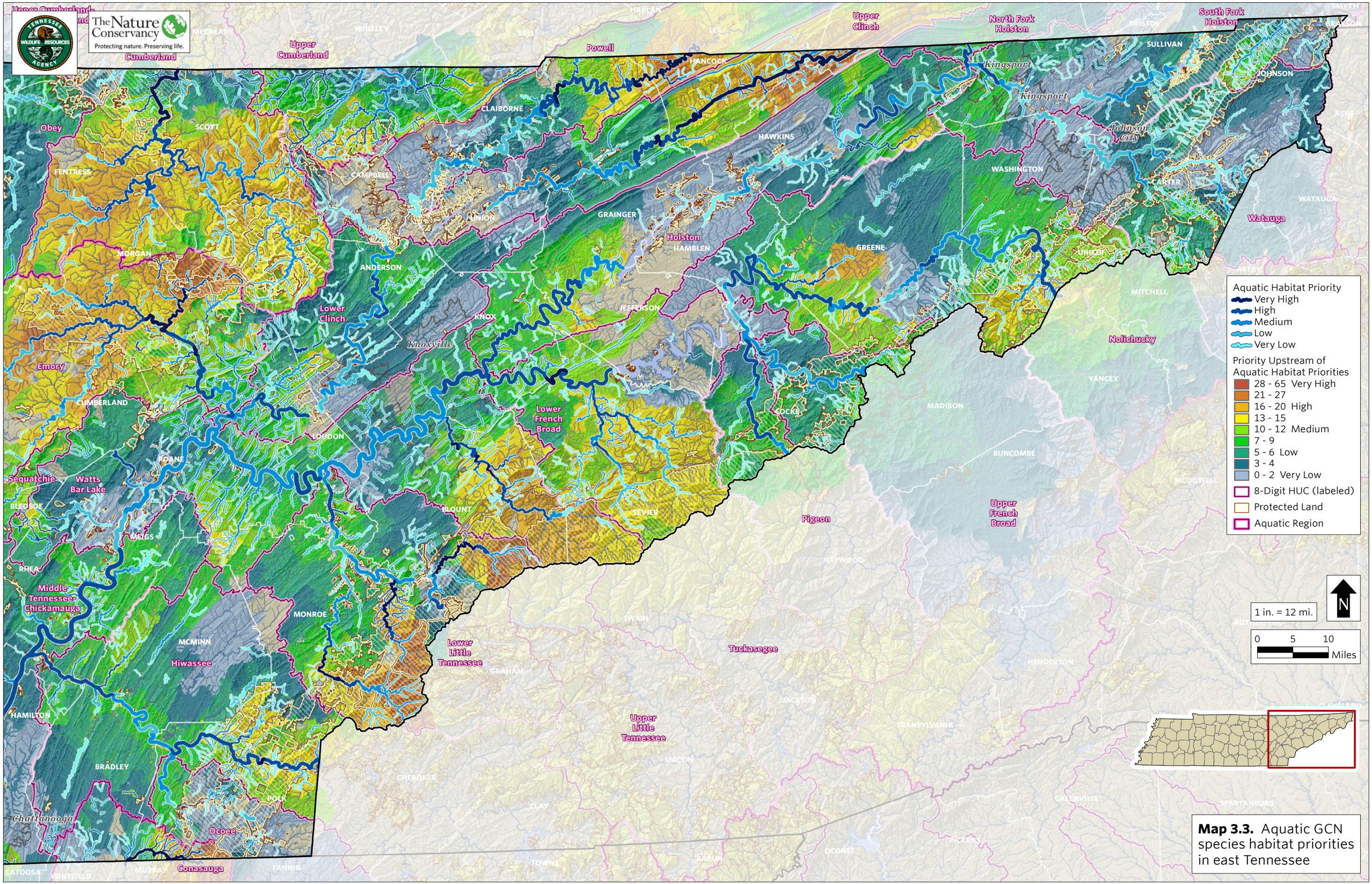
Map 2.3. Terrestrial GCN species habitat priorities in east Tennessee



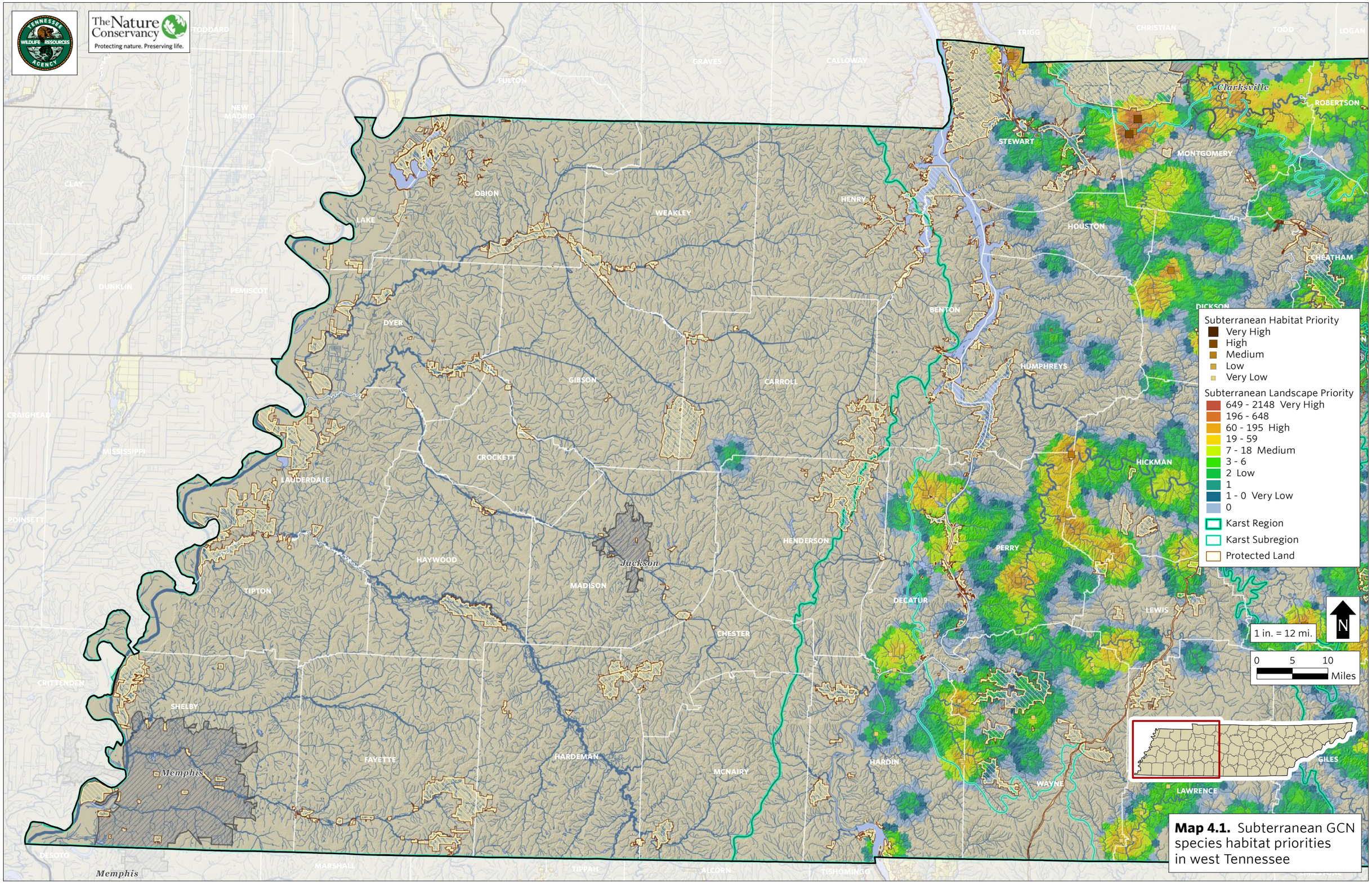
Map 3.1. Aquatic GCN species habitat priorities in west Tennessee



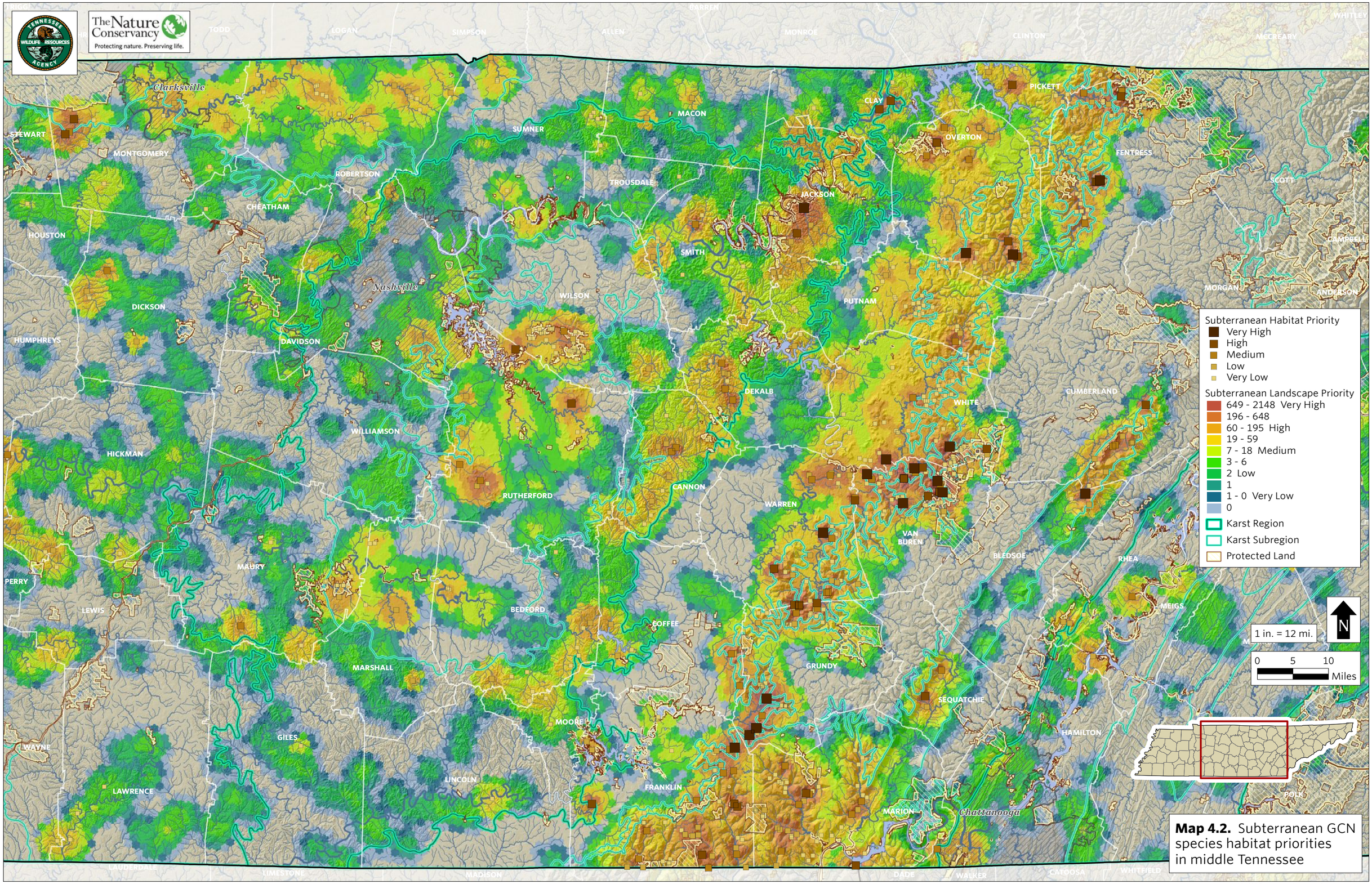
Map 3.2. Aquatic GCN species habitat priorities in middle Tennessee



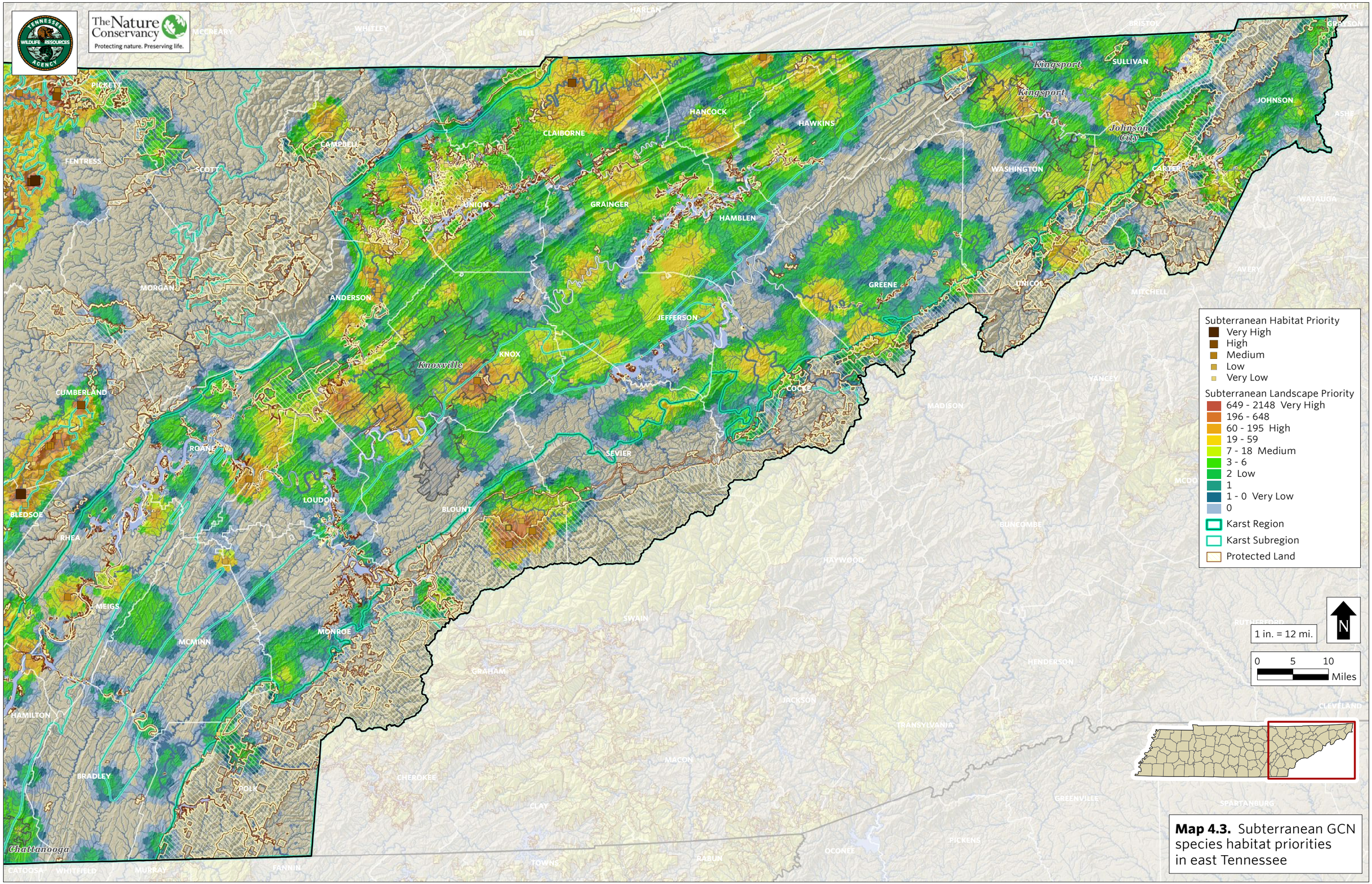
Map 3.3. Aquatic GCN species habitat priorities in east Tennessee



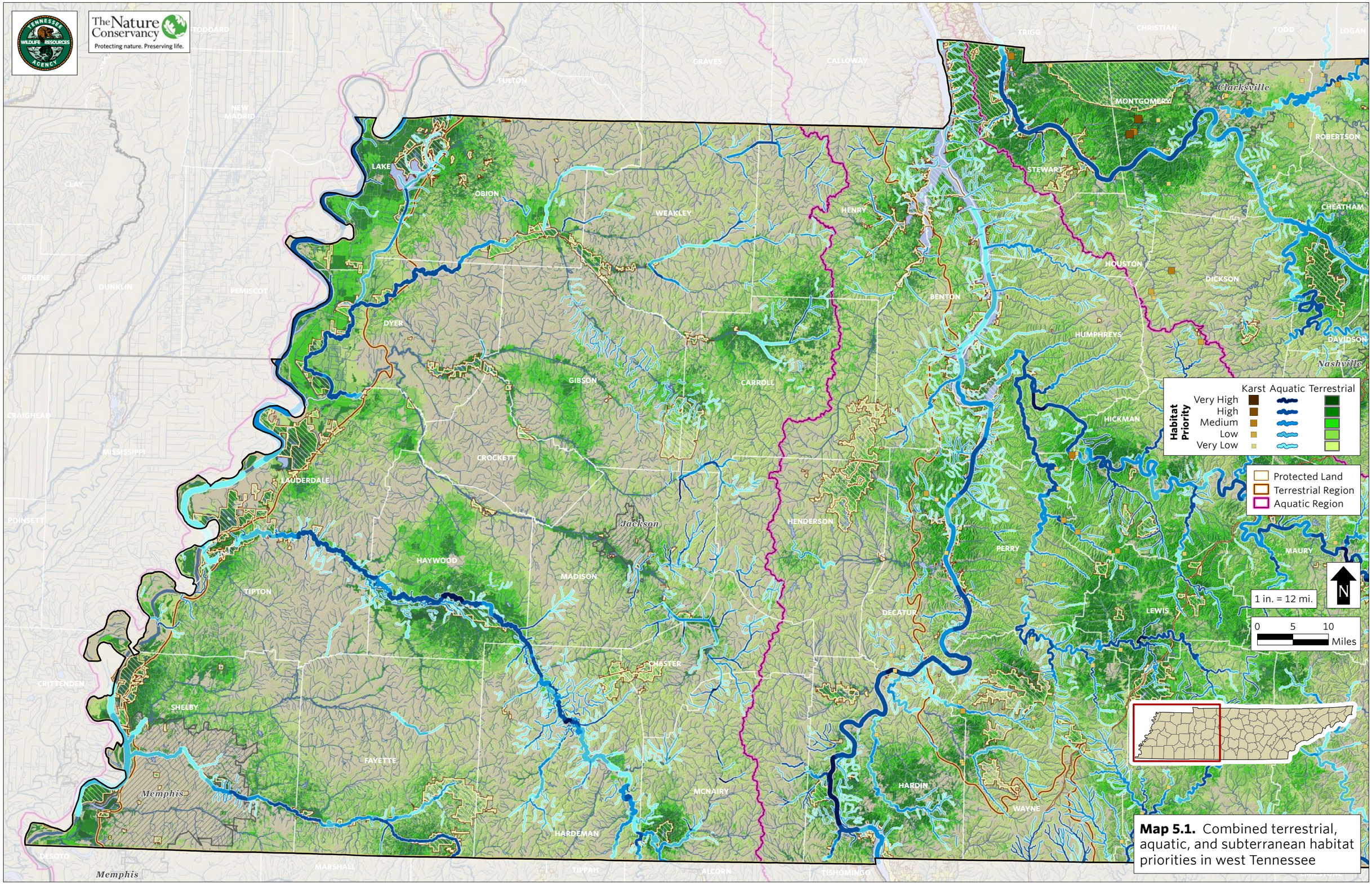
Map 4.1. Subterranean GCN species habitat priorities in west Tennessee



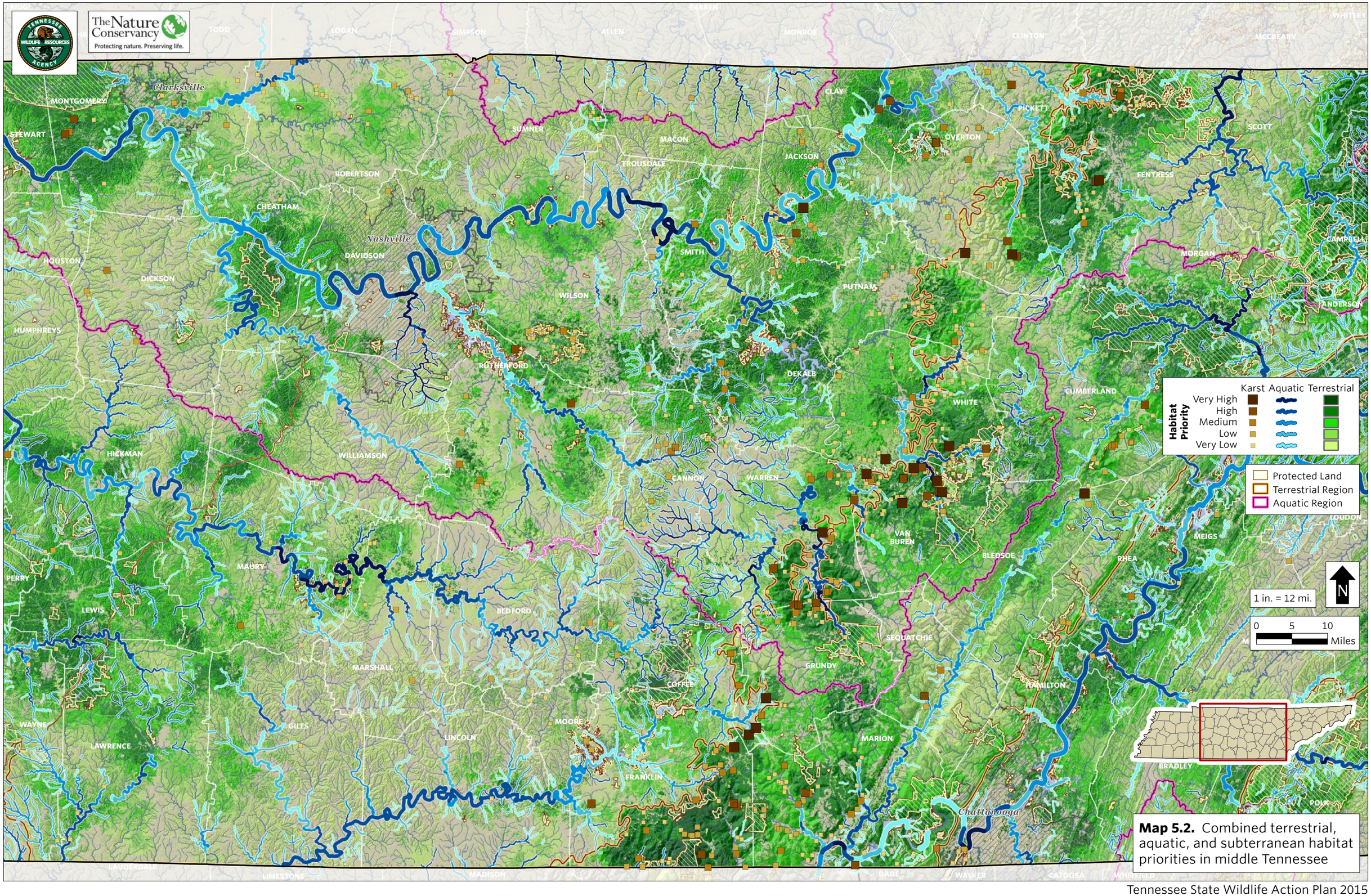
Map 4.2. Subterranean GCN species habitat priorities in middle Tennessee



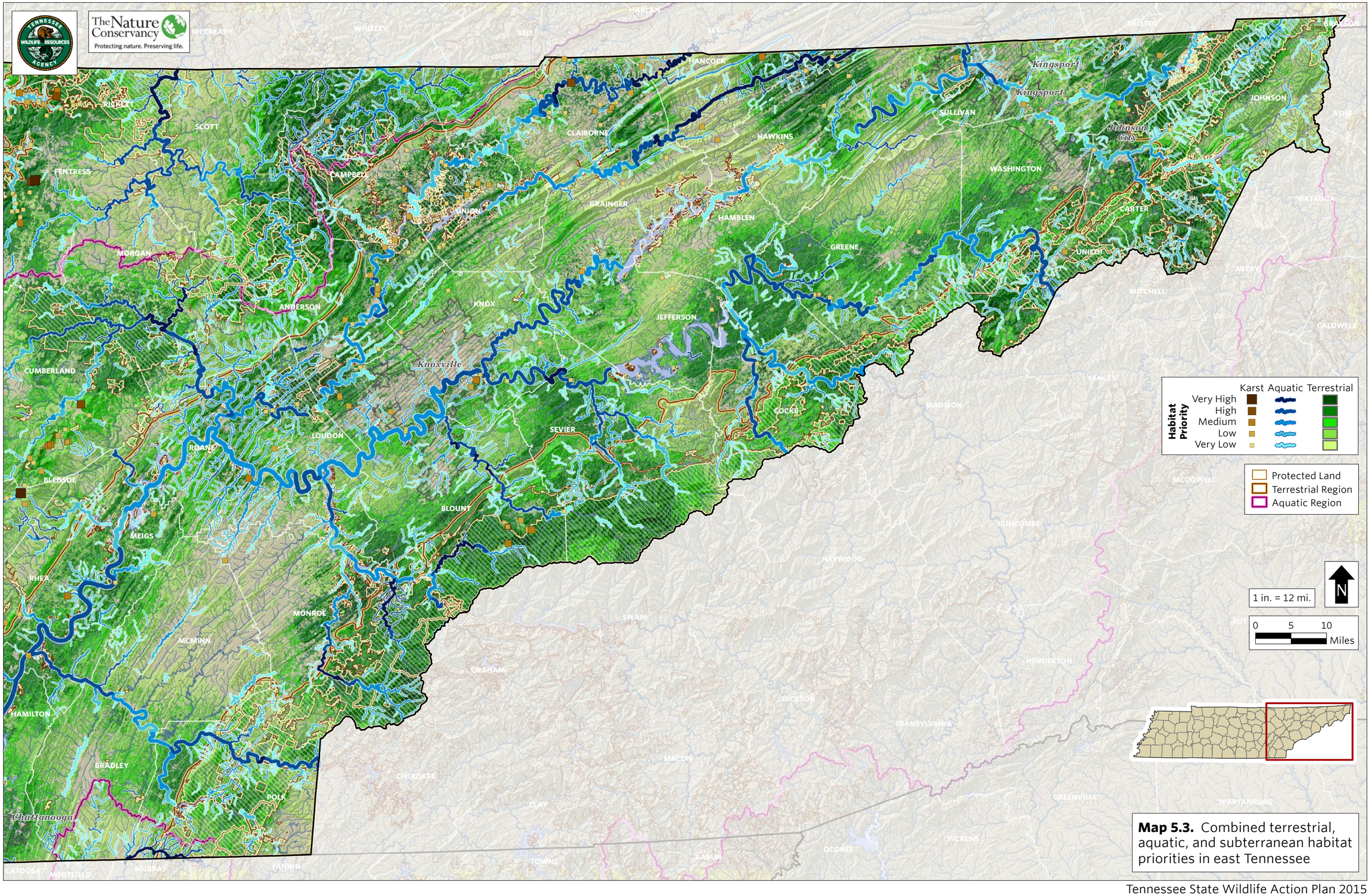
Map 4.3. Subterranean GCN species habitat priorities in east Tennessee



Map 5.1. Combined terrestrial, aquatic, and subterranean habitat priorities in west Tennessee



Map 5.2. Combined terrestrial, aquatic, and subterranean habitat priorities in middle Tennessee



Map 5.3. Combined terrestrial, aquatic, and subterranean habitat priorities in east Tennessee

3.2.8. Statewide Priority Habitat Summaries

Tables 7 through 12 summarize information on the priority terrestrial natural and semi-natural habitats by ecoregion. The data in these tables are ordered according to the average GCN species priority score for that habitat, with the scoring stratified down to the subregion scale. In certain instances, semi-natural habitats show higher priority scores than natural habitats in an ecoregion. This is due to the typically larger distribution footprint of species that can utilize semi-natural habitats (e.g. birds) and the fact that some natural habitats (e.g. cliffs or rockhouses) are very small in overall acreage, limiting the potential number of species that occupy them overall. In the Upper Gulf Coastal Plain and Mississippi River Alluvial Plain, bottomland and riparian forest habitats are most significant, and large acreages of upland forest types also occur in the Upper Gulf Coastal Plain. In the Interior Low Plateau (ILP), floodplain and riparian forests are again significant, as are both mesophytic and dry-mesic forests. The data for the ILP also demonstrate the significance of prairie, woodland/barren, and limestone glade habitats for a variety of rare GCN species. Prairie, woodland and limestone glade habitats can be smaller and more isolated in terms of their overall acreages in the ecoregion; however, they are home to many distinct plant and animal species. Forest habitat types also rank highest in priority within the Cumberland Plateau and Mountains and the Ridge and Valley ecoregions, although the specific forest system type shifts according to the ecoregion. In the Southern Blue Ridge, the dominant forest system, Southern Appalachian oak forest, ranks highly, as does a variety of other systems distributed in cove and high elevation settings in the ecoregion.

Table 13 summarizes the number of stream miles of highly-ranked habitat within each aquatic subregion across Tennessee. While the total amounts of the Conasauga and Barren River subregion watersheds within Tennessee are small in comparison to others, a good percentage of their stream miles in the state are ranked as high priority GCN habitat. The Cumberland, Tennessee, and Coastal Plain-Mississippi aquatic regions have an average of approximately 15%, 12% and 6% of their total stream miles within the state of Tennessee ranked as medium, high, or very high priority habitat.



Fall in the Blue Ridge of Tennessee - Bill Showalter

Table 7. Summary of priority terrestrial habitats in the Mississippi River Alluvial Plain

Mississippi River Alluvial Plain terrestrial habitats	Average GCN species priority score for habitat, stratified down to subregion	Total acres of very high-, high-, and medium-ranked habitat
Natural habitats		
Mississippi River Bottomland Depression	70.0	97
Mississippi River Low Floodplain (Bottomland) Forest	50.4	115,288
Mississippi River Riparian Forest	46.3	27,846
Semi-natural habitats		
Old Field / Successional	32.6	6,378
Pasture	28.0	225
Cropland	15.8	117,227

Table 8. Summary of priority terrestrial habitats in the Upper Gulf Coastal Plain

Upper Gulf Coastal Plain terrestrial habitats	Average GCN species priority score for habitat, stratified down to subregion	Total acres of very high-, high-, and medium-ranked habitat
Natural habitats		
East Gulf Coastal Plain Large River Floodplain Forest	27.0	86,989
South-Central Interior Mesophytic Forest	25.8	1,308
East Gulf Coastal Plain Small Stream and River Floodplain Forest	23.5	224,138
South-Central Interior Small Stream and Riparian	23.4	5,086
East Gulf Coastal Plain Northern Loess Bluff Forest	17.5	20,764
East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest	7.8	85,670
East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest	6.9	23,010
South-Central Interior / Upper Coastal Plain Flatwoods	5.2	5,017
East Gulf Coastal Plain Northern Dry Upland Hardwood Forest	4.3	55,639
East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland	3.4	13,046
East Gulf Coastal Plain Limestone Forest	1.6	5
Semi-natural habitats		
Old Field / Successional	11.3	100,017
Pasture	9.1	149,288
Cropland	5.7	252,860

Table 9. Summary of priority terrestrial habitats in the Interior Low Plateau

Interior Low Plateau terrestrial habitats	Average GCN species priority score for habitat, stratified down to subregion	Total acres of very high-, high-, and medium-ranked habitat
Natural habitats		
South-Central Interior Large Floodplain	39.0	28,293
Eastern Highland Rim Prairie and Barrens	28.7	61,511
South-Central Interior Small Stream and Riparian	25.5	39,352
Nashville Basin Limestone Glade and Woodland	23.8	86,410
South-Central Interior Mesophytic Forest	21.5	943,809
Southern Appalachian Low-Elevation Pine Forest	17.3	3,354
Southern Interior Low Plateau Dry-Mesic Oak Forest	13.7	1,015,574
Central Interior Calcareous Cliff and Talus	3.8	280
Central Interior Acidic Cliff and Talus	2.2	12
Semi-natural habitats		
Old Field / Successional	11.6	101,453
Cropland	7.4	105,393
Pasture	6.5	293,987
Forest Plantation	1.3	4,749

Table 10. Summary of priority terrestrial habitats in the Cumberland Plateau and Mountains

Cumberland Plateau & Mountains terrestrial habitats	Average GCN species priority score for habitat, stratified down to subregion	Total acres of VH, H, & M ranked habitat
Natural habitats		
South-Central Interior Large Floodplain	36.5	573
Southern and Central Appalachian Cove Forest	33.5	58,967
Southern Appalachian Montane Pine Forest and Woodland	29.4	5,383
Allegheny-Cumberland Dry Oak Forest and Woodland	27.9	619,308
Southern Ridge and Valley / Cumberland Dry Calcareous Forest	27.6	627,596
South-Central Interior Mesophytic Forest	27.2	322,982
Appalachian (Hemlock)-Northern Hardwood Forest	25.7	119,785
South-Central Interior Small Stream and Riparian	23.4	21,038
Southern Appalachian Low-Elevation Pine Forest	21.4	92,045
Cumberland Acidic Cliff and Rockhouse	15.7	1,812
Cumberland Riverscour	8.8	161
Semi-natural habitats		
Old Field / Successional	9.5	50,761
Pasture	8.0	34,468
Cropland	7.3	5,999
Forest Plantation	1.7	1,835

Table 11. Summary of priority terrestrial habitats in the Ridge and Valley

Ridge and Valley terrestrial habitats	Average GCN species priority score for habitat, stratified down to subregion	Total acres of VH, H, & M ranked habitat
Natural habitats		
South-Central Interior Large Floodplain	47.5	9,197
Southern Appalachian Oak Forest	47.4	2,748
Southern and Central Appalachian Cove Forest	37.5	5,625
South-Central Interior Mesophytic Forest	31.4	282,972
South-Central Interior Small Stream and Riparian	31.1	53,871
Southern Ridge and Valley / Cumberland Dry Calcareous Forest	29.2	746,861
Southern Interior Calcareous Cliff	29.0	5
Southern Appalachian Montane Cliff and Talus	27.7	36
Appalachian (Hemlock)-Northern Hardwood Forest	27.0	12,586
Southern Appalachian Low-Elevation Pine Forest	26.8	118,418
Allegheny-Cumberland Dry Oak Forest and Woodland	25.0	212,067
Southern Appalachian Montane Pine Forest and Woodland	18.0	932
Cumberland Acidic Cliff and Rockhouse	7.1	91
Semi-natural habitats		
Old Field / Successional	16.4	156,524
Pasture	15.9	482,969
Cropland	15.5	49,416
Forest Plantation	0.4	64

Table 12. Summary of priority terrestrial habitats in the Southern Blue Ridge

Southern Blue Ridge terrestrial habitats	Average GCN species priority score for habitat, stratified down to subregion	Total acres of VH, H, & M ranked habitat
Natural habitat		
Southern Appalachian Northern Hardwood Forest	40.4	12,956
Central and Southern Appalachian Spruce-Fir Forest	39.9	5,775
Southern and Central Appalachian Cove Forest	34.4	124,142
Appalachian (Hemlock)-Northern Hardwood Forest	30.6	68,148
Southern Appalachian Oak Forest	30.4	719,556
Southern Appalachian Rocky Summit	26.0	165
South-Central Interior Small Stream and Riparian	25.0	14,012
Southern Appalachian Montane Pine Forest and Woodland	24.6	10,183
Southern Appalachian Low-Elevation Pine Forest	23.5	100,503
South-Central Interior Large Floodplain	20.5	444
Southern Appalachian Montane Cliff and Talus	18.2	340
Southern Appalachian Grass and Shrub Bald	9.5	462
Southern and Central Appalachian Bog and Fen*	2.6	12*
Semi-natural habitat		
Old Field / Successional	10.1	2,725
Pasture	5.9	687

*Acreage for Southern Central and Appalachian Bog and Fen habitat includes total across all ranks.

Table 13. Summary of priority aquatic habitats, summarized by aquatic subregion

Aquatic Subregion	Linear stream miles in subregion	Total stream miles of very high-, high-, and medium-ranked habitat	% of linear stream miles ranked very high, high, and medium
Barren River	588	111	19
Coastal Plain, Mississippi River	14,886	875	6
Conasauga River	234	63	27
Cumberland River, Cumberland Mountain	1,844	455	25
Cumberland River, Lower Cumberland	4,433	381	9
Cumberland River, Nashville Basin	2,397	253	11
Cumberland River, Upper Cumberland	5,205	720	14
Tennessee River, Blue Ridge	8,276	762	9
Tennessee River, Cumberland Plateau	4,491	499	11
Tennessee River, Lower Tennessee	11,045	1240	11
Tennessee River, Nashville Basin	4,679	671	14
Tennessee River, Ridge and Valley	6,808	1055	15



CHAPTER 4

PROBLEMS AFFECTING SPECIES AND HABITATS

4.1. Assessing Problems Affecting Species and Habitats

THE NEXT PHASE OF THE TN-SWAP REVISION EFFORT involved conducting a review and revision of the problems which may be adversely affecting species of Greatest Conservation Need (GCN) and their habitats in Tennessee. Although the problems differ across geography, flora, and faunal groups, all species designated as GCNs face one or more threats to their survival, including threats to habitat health and persistence and/or population stressors such as pollution and disease.

Certain issues, often related to human activities and management of lands and waters, pose threats to a range of habitat types and GCN species across the state. It is important to note, however, that in many cases people can make adjustments or implement "best practices" to mitigate or even eliminate the threats that these activities pose. In the past decade, conservation scientists and planners have become focused on understanding larger, or "landscape-scale" patterns of change to lands and waters as a means of evaluating challenges to habitat or population persistence. In addition, the negative impacts from climate change stressors increasingly are of concern to the short- and long-term health of GCN species and their habitats across the U.S. (NFWPCAP 2012).

Photo credit: Couchville Cedar Glades State Natural Area/prairie coneflower. Without proper management, grass and forb-dominated barrens often experience encroachment of woody species - Byron Jorjorian

4.1.1. Review and Update of Major Statewide Problems

The 2015 SWAP team used the Best Practices recommendations (AFWA 2012) to assist with the review of problems facing species and habitats (See Appendix A). In the 2005 planning effort, Tennessee followed a best practice, using a standardized process and hierarchy for identifying stresses and sources of stress aligned with broader categories defined by the Conservation Measures Partnership (CMP) (Salafsky et al. 2008). At the time, over 35 "sources" or problems, were identified and linked to 20 major ecological stress types, then the stress and source combinations linked to every GCN species and then evaluated for the scope, severity, timing, reversibility, and contribution to potential population declines in different regions of the state.



Both urban and rural development can have major impacts on the habitat of both terrestrial and aquatic species in Tennessee - Greg Wathen, TWRA

These evaluation assignments were captured in the SWAP database, then summarized to create cumulative ranking scores to identify the major problems facing GCN species distributed in the major terrestrial, aquatic, and subterranean regions of the state (see TWRA 2005, pp. 66-75). In 2005, TWRA lacked the planning time and resources to map the distribution of different problem sources, relying instead on an expert-derived estimate of the percentage of a species range that could potentially be affected by specific source-stress combinations. Therefore, the 2005 SWAP did not have the ability to spatially assess the intersection of problems with priority habitats to inform

Summary: 2015 process for identifying and prioritizing problems affecting GCN species and their habitats

1. Review and revise problems identified in 2005. The planning team determined 2005 SWAP problems are still representative of current problems for GCN species and habitats.
2. Categorize problems. Using the standardized Conservation Measures Partnership hierarchy, the team cross-walked 2005 problems to the most recent updated threats classification from 2015. Three additional problems were added: recreational area development , renewable energy development, and over-collection of plant species.
3. Prioritize threats. The team focused on the most consistently high-ranked problems from 2005 and, when possible for a particular problem, added a spatial assessment component to help identify the location of problem sources relative to priority GCN habitats. Problem rankings for individual species were not changed or updated from 2005.
4. Incorporate climate change as a major new source of stress. A separate climate change vulnerability assessment for Tennessee was prepared by the National Wildlife Federation and The Nature Conservancy, building on a SWAP update report on climate change issued by TWRA in 2009. The assessment examines data on species vulnerability, landscape resiliency, and potential vegetation change to gain a better understanding of the range of GCN vulnerabilities across the state.

decision-making. Priority sources of stress were summarized in tabular format only and divided into terrestrial, aquatic, and subterranean regions.

The 2015 SWAP team reviewed the 2005 SWAP major stresses and potential sources of stress hierarchies and determined that they were still representative of current problems (Appendix E). The team also determined that the 2005 stresses to new GCNs identified as part of the update process remain the same, with the exception of plants, for which the 2005 stresses identified for fauna only do not completely apply.

Major statewide issues addressed in 2015 are urbanization; agricultural land management; forestry practices; water management; energy development; and transportation and utility corridors.

Three additional major problems were added during the 2015 revision process: potential issues with recreational area development, renewable energy sources, and over-collection of plant species. A crosswalk exercise was completed between the 2005 sources of stress hierarchy and the more recent CMP Open Standards threats classification (**Version 2, Beta – February 2015**). Appendix E provides the summary of the crosswalk exercise and shows the addition of the new potential sources of stress for 2015.

In reviewing the 2005 prioritization assessments for the terrestrial, subterranean, and aquatic regions, the 2015 planning team identified patterns in which sources of stress consistently emerged as top issues across all the regions, and grouped these sources by general category (for more details, see TWRA 2005, pp. 84-146). The team also documented which of these 2005 problems, and any emerging issues since 2005, warrant the greatest focus moving forward.

In assessing problems for the 2015 revision, the planning team chose to focus on the major sources of stress across the state, using new spatial information and analyses to understand where major problem sources intersect with priority GCN habitats rather than conducting new species-by-species rankings. Examining problems in this fashion allowed the team to focus on the highest priority issues and the major landscape-scale drivers of change in Tennessee to better inform conservation investments and collaborations with conservation partners.

As detailed in Section 3.2 and elaborated further in Section 4.2, the SWAP GIS database design allows for flexible assessments of habitat priorities and sources of stress to GCNs at a variety scales in Tennessee when spatially-relevant data are available. For example, urbanization issues were identified as a major problem in the 2005 SWAP, but the specificity of where on the landscape urbanization pressures intersected with GCN species and habitats was not identified. By

utilizing spatial analyses for the 2015 update, the planning team has documented where in Tennessee urbanization pressures must be addressed to protect GCN species and habitats. In addition, the associated database features allow planners to identify which GCN species, how many occurrences, and which habitat types are under pressure at a given location when that type of information is needed for project-specific work.

The most frequently documented potential sources of stress in 2005, summarized as major issues for 2015, include urbanization (its associated infrastructure and water uses); agricultural land management; forestry practices; water management; energy development; and transportation and utility corridors. These land and water use issues typically have a landscape-level footprint across one or more regions of Tennessee, and effectively managing for better habitat outcomes requires education and active engagement of the private sector and government agencies involved in land and water management, transportation, and compensatory mitigation decisions (AFWA 2012).

Fire suppression is a significant issue for multiple grassland, forest, and woodland habitat types statewide, and managing certain recreational activities remains a challenge for protecting species and habitats in specific locations. The collection of particular plant and animal species in different regions of the state must be monitored, and regulations enforced, to prevent overharvest and species population declines. Additional areas receiving increased emphasis for the 2015 update are problems associated with the ongoing spread of several disease pathogens and invasive exotic species, particularly



Brown-headed Nuthatch, a species whose habitat is threatened by altered fire regimes - Allen Sparks



Coal pile at Baldwin Plant in Anderson County; coal is a significant source of air pollution - Appalachian Voices



Pathogen infection: Snake fungal disease - Daniel Bryan - Cumberland University

those affecting cave dwelling bat species, reptiles, amphibians, and forest habitats. Airborne pollutants also remain a challenge, as acid rain and deposition of bioaccumulative toxic metals



Topographical variation creates landscape diversity, which contributes to resilience. Southern Blue Ridge mountains - Greg Wathen, TWRA.

such as mercury damage both terrestrial and aquatic habitats, particularly in the eastern two-thirds of Tennessee.

4.1.2. Climate Change Impacts Assessment

Like many SWAPs across the country, the 2005 version of Tennessee's plan did not explicitly address the potential impacts of climate change scenarios on GCN species and habitats. However, in 2009, TWRA published an update report for the SWAP entitled *Climate Change and Potential Impacts to Wildlife in Tennessee* (TWRA 2009). This report served as the first comprehensive review of the scientific literature on climate change at the time and the potential impacts on fish, wildlife, and habitats in Tennessee.

Understanding the synergies and linkages among multiple stresses affecting wildlife and plants, including climate change, is necessary for the development of successful conservation strategies. For the 2015 comprehensive update, TWRA built on the 2009 effort by contracting with the National Wildlife Federation to provide a Climate Change Vulnerability Assessment for Tennessee and to guide TWRA on the selection of appropriate adaptation strategies. (Glick et al. 2015).



Some amphibians may suffer disproportionately from climate change effects in TN. Southern Cricket Frog - Patrick Coin via Wikimedia

The primary emphasis of the assessment effort was to examine three major aspects of climate change impacts: species vulnerabilities, terrestrial and aquatic habitat changes, and landscape resiliency. Species vulnerability assessments using NatureServe's **Climate Change Vulnerability Index** (CCVI) (Young et al. 2011) were conducted by TWRA and academic experts for 189 GCN plant and animal species. Changes to terrestrial vegetation were identified using the U.S. Forest Service's Terrestrial Climate Stress Index (TCSI) methodology (Joyce et al. 2008). Data on landscape resiliency from The Nature Conservancy's *Resilient Sites for Terrestrial Conservation in the Southeast U.S.* (Anderson et al. 2014) were used in

combination with the TCSI outputs and the SWAP terrestrial habitat priorities to gain a better understanding of the range of GCN habitat vulnerabilities across the state (Glick et al. 2015).

4.2. Updates to SWAP GIS and Database Information on Major Problems

In the decade since the 2005 SWAP was developed, through a variety of different project collaborations, TNC and TWRA have compiled a wide array of additional GIS data and spatial analyses to improve understanding of the major landscape-scale problems facing GCN species and habitats across the state. These efforts have focused on the aggregation and classification of state water quality and permit data managed by the Tennessee Department of Environment and Conservation (TDEC), the National Inventory of Dams, the USDA Cropland data coverage, urban growth boundary and population growth data from the State of Tennessee and University of Tennessee-Knoxville, and U.S. Office of Surface mining permitted lands. Field survey and planning efforts conducted by many partners to track the spread of pathogens, such as White-nose Syndrome in bats and Hemlock Woolly Adelgid in native hemlock forests, have also been used to map the current spatial extent of these problems.

Section 3.2.4. ***Updates to Habitat Mapping Units*** describes the basic unit of assessment for terrestrial, subterranean, and aquatic habitat priority maps (700-acre hexagon rosettes and NHDPlus v2 catchments, respectively). These same mapping units are used for assessments of potential problems. The GIS and relational database capacity makes it possible to look at the intersection of different types of land and water uses with the priority habitats identified for GCN species, and the mapping units allow for these data to be summarized at a variety of different spatial scales.

Understanding the current and potential spatial footprint of major land and water uses, as well as how these uses intersect with priority habitats, is critical to identifying habitat protection, restoration, and management needs and opportunities.

The maps and data summaries provided in this 2015 update document are intended to represent the scope and distribution of major potential problems including urbanization, agriculture, river and stream management, and non-renewable energy development. Also included are example distribution



Farmland in Tennessee - Joel Kramer

maps of White-nose Syndrome and the spread of Hemlock Woolly Adelgid. It is important to emphasize that these assessments are intended to direct attention to *potential* problems for habitats based on known issues with land and water management practices in general; they do not provide information on the presence or absence of best management practices in a given situation. The existence of actual problems always must be verified in the field with site specific knowledge and assessments.

For example, improving agricultural management practices in priority areas can improve outcomes for GCN freshwater species and overall water quality. These investments are being made by state and federal partners and private landowners across the state. The "potential" problem maps associated with agricultural land management do not contain information about where these actual on-the-ground practices are being used. Instead, these maps emphasize where best management practices may be targeted to achieve better outcomes for GCN species. In addition, the data associated with permitted activities are not intended to substitute for the standard reviews and decision-making performed in a regulatory context by both state and federal agencies. Rather, these data should be complementary to those reviews, as it can provide both a local- and a landscape-scale context of the associated activities with respect to important GCN habitats. In addition, the 2015 mapping assessments do not include potential issues with renewable energy, transportation corridors, and utility/service line development, all of which have the potential for large spatial footprints in certain sections of the state. Data on these activities are becoming increasingly available, and examinations in the context of habitat priorities will be an important data update need in the near future. A more detailed methods explanation for the landscape analyses of major problems is available in The Nature Conservancy's publication *Database Development and Spatial Analyses in Support of Tennessee's State Wildlife Action Plan* (Wisby and Palmer 2015).



Powerlines - Artondra Hall

Compared to 2005, the data development effort for the 2015 update allows TWRA and its many partners to conduct a variety of more detailed problem assessments to serve specific project needs. Examples of efforts already in progress include partnerships for specific agricultural watersheds to identify where riparian buffer improvements can help improve aquatic GCN habitats (see Elk River case study). GIS scientists with the Southeast Aquatic Resources Partnership are using the information and other applications they are developing to create more refined tools for prioritizing which stream barriers to remove for improved stream network and habitat connectivity (Granstaff et al. 2015).

TENNESSEE CASE STUDY: Fair market conservation incentives for private landowners in the Elk River Watershed Conservation Opportunity Area

Guided by Tennessee's State Wildlife Action Plan (SWAP) data, the Tennessee Wildlife Resources Agency identified the Elk River watershed as a priority for improving water quality. The elimination of riparian habitat along the Elk River and tributaries over the years has degraded water quality, so TWRA joined forces with the Tennessee Valley Authority (TVA), the National Fish and Wildlife Foundation (NFWF), the Natural Resources Conservation Service (NRCS), The Nature Conservancy (TNC), and other partners to develop increased conservation incentives for private landowners in the Elk River COA. The goal of this targeted program is to create 26 miles of stream buffer that will contribute to improved water quality.

> Agency partnerships and science-based conservation are the hallmarks of a new conservation program effort taking shape in the Elk River watershed of Tennessee.

The USDA's existing Conservation Reserve Program (CRP) continuous signup practices can pay farmers for contract periods of 10 to 15 years by reimbursing approximately 90% of the costs of establishing riparian buffers as well as annual payments to offset income losses from retired cropland or marginal pastureland, plus a one-time Signing Incentive Payment. The program also cost-shares mid-contract management practices, such as prescribed fire or herbicide applications.

However, agricultural producers in the Elk River area have been reluctant to enroll in CRP because the high price of corn and other crops has made incentive payments far less attractive. University of Tennessee Extension performed an analysis of crop pricing to arrive at a competitive CRP payment in the region. The TVA, TWRA, and NFWF then supplied additional funding for several CRP buffer practices, managed by the Farm Services Agency and NRCS, to create the new Elk River incentive program. In addition to the normal payments listed, the new effort offers an additional one-time payment of $1500 per acre for herbaceous buffers and $1700 per acre for forest buffers to be established through planting trees, creation of grass filter strips, and cattle fencing to protect creeks combined with alternative sources of water for livestock.









Top to bottom: Prothonotary Warbler - Noel Pennington; Gray Bats - USFWS; Snuffbox Mussel - USFWS; Ashy Darter - Conservation Fisheries/next page: Runoff from a farm in Tennessee - Tim McCabe, USDA NRCS; Clint Borum, TWRA with farmer Rich Koker-Chris Wolkonowski, NRCS

The agencies recognize that the public needs to compensate landowners for providing public benefits such as clean water. For this reason, these incentives are far higher than standard CRP rates to cover the higher opportunity costs associated with land retirement in this region. They are currently seeking leaders in the farming community to set an example by signing up for the program.



The hope in restoring 26 miles of buffer in selected subwatersheds is to make measurable benefits for water quality and aquatic species. The subwatersheds chosen provide habitat for a diversity of species of Greatest Conservation Need: songbirds such as the Prothonotary Warbler (*Protonotaria citrea*) and Yellow-billed Cuckoo (*Coccyzus americanus*); Gray Bats (*Myotis grisescens*) that rely on riparian and stream habitats for foraging; and a variety of aquatic organisms. The aquatics include the endangered mussel species Cracking Pearlymussel (*Hemistena lata*), Cumberland Monkeyface (*Quadrula intermedia*), Dromedary Pearlymussel (*Dromus dromas*), and Snuffbox mussel (*Epioblasma triquetra*), to name just a few.



In a state known for its freshwater mussel diversity, NRCS and Soil Conservation District personnel and TWRA private lands biologists are working side-by-side to achieve conservation objectives that benefit local streams and their wildlife, as well as downstream communities that rely on clean water from the Elk River.

4.3. Major Statewide Land and Water Uses

This section describes land and water uses that have large footprints in Tennessee and can result in widespread detrimental impacts to species and habitats.

4.3.1. Urbanization

Residential, commercial and industrial development can lead to a host of impacts to habitats, wildlife, and plants. This is particularly true in locations across the state where cities or towns are growing in ways that consume more land and put more pressure on surface and ground water resources to provide drinking water and dilute wastewater (Thurman and Terry 2011). These negative effects can include:

- direct loss of habitat through land conversion to other uses or stream habitat destruction;
- habitat fragmentation;
- increased runoff as a result of increasing levels of impervious surface, leading to erosion and/or water quality issues;
- increased flooding;
- expanding transportation or service corridors that can fragment habitat or block the movement of smaller, less mobile species.

According to the National Wildlife Federation, for an estimated 85 percent of imperiled plant and animal species worldwide, habitat loss or degradation is the principal threat to their continued existence. Sixty percent of the rarest and most imperiled species in the U.S. occur in metropolitan areas, especially the 35 fastest growing large metro

Box 5. How habitat fragmentation caused by development is affecting Streamside Salamanders in middle Tennessee

The Streamside Salamander (*Ambystoma barbouri*) uses both terrestrial and aquatic habitats throughout the year. During breeding season, these salamanders migrate from upland forests to first and second order streams where they attach their eggs to the underside of large rocks. The larvae develop in these streams until metamorphosis occurs, at which time they migrate into the surrounding upland habitat.

The majority of Streamside Salamander populations are located in middle Tennessee, just outside the current footprint of major cities. Habitat alteration as a result of urbanization leading to fragmented habitats is the main threat to this species in Tennessee (Niemiller et al. 2006). These salamanders are typically not found in streams where the surrounding forests have been removed (Lannoo 2005), and populations are thought to have been lost as a result of development (Mitchell et al. 1999). Development of conservation plans to protect terrestrial habitat surrounding first and second order streams is critical for this species (Niemiller et al. 2006).



Streamside Salamander - Matthew Niemiller

areas, which include both Memphis and Nashville. Though they comprise only 8 percent of the lower 48 states' land area, these metro areas are home to nearly one-third of the nation's declining species (Ewing et al. 2005).

Impacts to Terrestrial Habitats

Urbanizing land use patterns affect terrestrial species and habitats in a variety of ways. For example, urbanization can result in a shift in the types of species that live and thrive in a region, with non-native species often competing with or replacing native species. A review of 105 studies on the effects of urbanization found trends of increasing proportions of nonnative species toward urban cores in plants, birds, mammals, and insects. The effects of moderate urbanization (i.e. suburbs) varied significantly, with most studies indicating an increase in plant species richness, due in part to exotic species introductions, whereas most studies of invertebrates and non-avian vertebrates show decreasing species richness with increasingly intense urbanization (McKinney 2008).

Fragmentation

Terrestrial habitat fragmentation can affect the health and size of wildlife and plant populations by reducing the ability of organisms to migrate and/or disperse, which in turn can lead to inbreeding and loss of genetic diversity. Plants are intrinsically less mobile so may be more susceptible to habitat fragmentation and succession. Fragmentation can occur in a variety of settings across the state, including development in and around existing public lands. For example, development in the eastern mountains of Tennessee on steep mountainsides and ridge tops can damage viewsheds and decrease tree cover, which leads to erosion and habitat fragmentation. (Thurman and Terry 2011). Without greater attention to planning and proper management, the development of vacation and recreation sites can fragment significant conservation landscapes and public lands.



European Starlings, non-native species now widespread throughout North America in cities and countryside, displace and compete with many native bird species - Alden Chadwick

Land management patterns

An increased risk of land development can also be associated with forestland ownership. For example, on the Cumberland Plateau, much forestland held for decades by timber companies has been sold to institutional investors. These investor groups can be excellent land managers and conservation partners. However, depending on the income planning horizon and expectations, increased pressure may be placed on harvesting forest products and selling land assets for other types of development. Reduction of forestlands can also negatively impact water quality and quantity, the health and diversity of habitats, and other land values such as recreation, timber, and forest products. (Thurman and Terry 2011).

Parcelization

In addition, as development fans out into rural areas, a phenomenon known as parcelization can occur, in which larger landholdings are subdivided into smaller and smaller ownership units. Even in the absence of habitat fragmentation in terms of actual land use change, parcelization increases the difficulty of providing coordinated and coherent habitat management on a scale suitable for many wildlife and plant species. For example, when private lands with a history of conservation management using prescribed fire are subdivided, it will take far more effort and coordination among multiple landowners to conduct prescribed burns over the same acreage (EGCPJV 2014).

Unplanned development

Unplanned development patterns also have a high cost to local communities, their economies, and cultural heritage. A 2011 report of the Tennessee Advisory Commission on Inter-governmental Relations concluded that if Tennessee continues to adhere to sprawling development patterns, nearly 800,000 additional acres of open land will be developed by 2025. While developed land in Tennessee increased by more than 12% from 1982 to 2007, the percentage of cropland decreased by more than 25%, putting Tennessee among the top 8 states nationwide for loss of prime farmland. Local governments, tax payers, and utility rate payers often subsidize the real cost of sprawl through expensive and inefficient infrastructure expansions (Thurman and Terry 2011).

Impacts to Aquatic Habitats

The complex relationship between land use and stream health means that several aspects of the land urbanization process contribute to declines in the state's water resources. Urban development can alter the stream flows, habitat quality, and water chemistry of streams in both direct and indirect ways (USGS 2015).

Urban development often results in direct alterations of streams, either to accommodate development of a specific site, improve site drainage, or access to a site. Direct stream alteration can degrade the physical habitat and contribute to downstream channel erosion, sedimentation, or lower stream flows. All of these changes reduce spawning, feeding, and living spaces of aquatic organisms (USGS 2015).

Faster and more frequent runoff from paved and built surfaces increases and destabilizes normal stream flow, which also alters streams and increases erosion. Rapid runoff carries surface pollutants directly to streams and reduces natural



Urban Drains carry pollutants; impervious road surfaces increase runoff and destabilize normal stream flow. - KOMU News

water infiltration through the ground back to groundwater and aquifer recharge. Lowered aquifers may then contribute to lower stream flows, particularly in summer months (USGS 2015). Flooding can be exacerbated by both development in the floodplain and the failure to plan for stormwater management and adequate water infiltration to the ground. For example, a study of 21 stream sites in the Ridge and Valley ecoregion of Tennessee and Georgia revealed that more urbanized watersheds were characterized by increased proportions of fine sediments and pool areas, coupled with reduced variation in stream channel complexity. Urbanized watersheds exhibited declines in biotic integrity, species diversity, richness, and evenness (Smith 2009).

Sources of pollution from developed areas commonly include fertilizers, pesticides, animal waste, septic tanks, sewage, erosion from construction, vehicular fluids, and industrial and commercial site runoff. These sources contribute to an increase in concentrations of contaminants in streams including nitrogen, chloride, insecticides, and polycyclic aromatic hydrocarbons (PAHs). A USGS study found that aquatic invertebrate communities begin to degrade from the onset of urban development, which indicates that some species are highly sensitive to physical and chemical changes associated with urban development. (USGS 2015).

The Tennessee Water Quality Assessment Report (TDEC 2012/EPA 2015) provides a comprehensive summary of water quality assessments for the state's waters (See Table 14). Urban-related storm-water, wastewater, and construction activities are three of the top five sources of impairment to Tennessee streams.

Table 14. Top 5 causes and sources of stream impairment in Tennessee (TDEC 2012/EPA 2015)

Sources of Stream Impairment	Stream miles
CAUSES OF STREAM POLLUTION	
Pathogens (mainly E. Coli)	7364.5
Habitat Alterations	6785.9
Sediment	6187.6
Nutrients (includes phosphorus and nitrogen)	3380.2
Organic Enrichment/Oxygen Depletion	1823.3
SOURCES OF STREAM POLLUTION	
Agriculture (includes grazing in riparian zones and non-irrigated crop production)	8,780.1
Hydromodification (includes channelization, upstream impoundments, and dredging)	4349.6
Urban-related Runoff/Stormwater	2786.6
Municipal Discharges/Sewage	1560.2
Construction (includes site clearing for development and transportation corridors)	1003.1

Impacts to Karst Habitats

Karst landscapes are characterized by caves, sinkholes, underground streams, and other features formed by the slow dissolving, rather than mechanical eroding, of bedrock (Veni et al. 2001). With more than 10,000 documented, Tennessee has the greatest number of caves in the country equalling about 20% of all known U.S. caves (Wisby and Palmer 2015). Most Tennessee caves are associated with karst composed of

limestone in the central and eastern regions of Tennessee. Karst areas present unique challenges because so many of the processes key to their formation and stewardship are located underground, invisible from the surface. For this reason, the complex hydrologies of karst aquifers and other critical processes require specialized monitoring and assessment (Veni et al. 2001).



Hubbard's Cave: Tennessee has more caves than any other state in the U.S. Much of middle and eastern Tennessee is underlain by karst. - Byron Jorjorian

Karst regions are rich in water and mineral resources, providing unique habitats and spectacular recreational opportunities. Problems associated with living on karst can threaten both people and natural resources. Problems for people include sinkhole collapse, sinkhole flooding, and easily polluted groundwater that rapidly moves contaminants to wells and springs. Problems to the unique biota associated with caves and aquatic habitats include sediment and pollutants that infiltrate from the surface, as well as alteration of drainage conditions and the aquifer itself (Veni et al. 2001).

A variety of best management practices (BMPs) exist to help reduce these types of potential impacts. BMPs rely on knowledge of the location of karst and aquifers, combined with practices designed largely to avoid impacts from contamination or hydrological alteration. BMPs for living and working in karst regions cover the following activities:

- development and road construction
- wells and groundwater mining
- septic and sewage systems
- agriculture and livestock production
- timber harvest

(Veni et al. 2001)

Sinkholes are subject to flooding in response to precipitation; flood duration depends on the rate of water inflow, outflow, and degree of hydrologic connection to groundwater. Insufficient delineation of sinkholes and incomplete knowledge of their characteristics can result in development patterns that exacerbate sinkhole flooding (Bradley and Hileman 2006). Since many of Tennessee's growing urban areas are

located in karst regions, the understanding and mapping of these habitats is critical.

Mapping urbanization in Tennessee

While the population of Tennessee increased by 16.7% from 1990 to 2000, this rate subsequently declined. However, from 2000 to 2010, Tennessee's population still increased by 11.5% (US Census 2000 and 2010). The 2005 SWAP identified development-related issues as the most consistently high-ranked stressors to terrestrial, aquatic, and subterranean GCN species, and this assessment remains applicable in 2015.

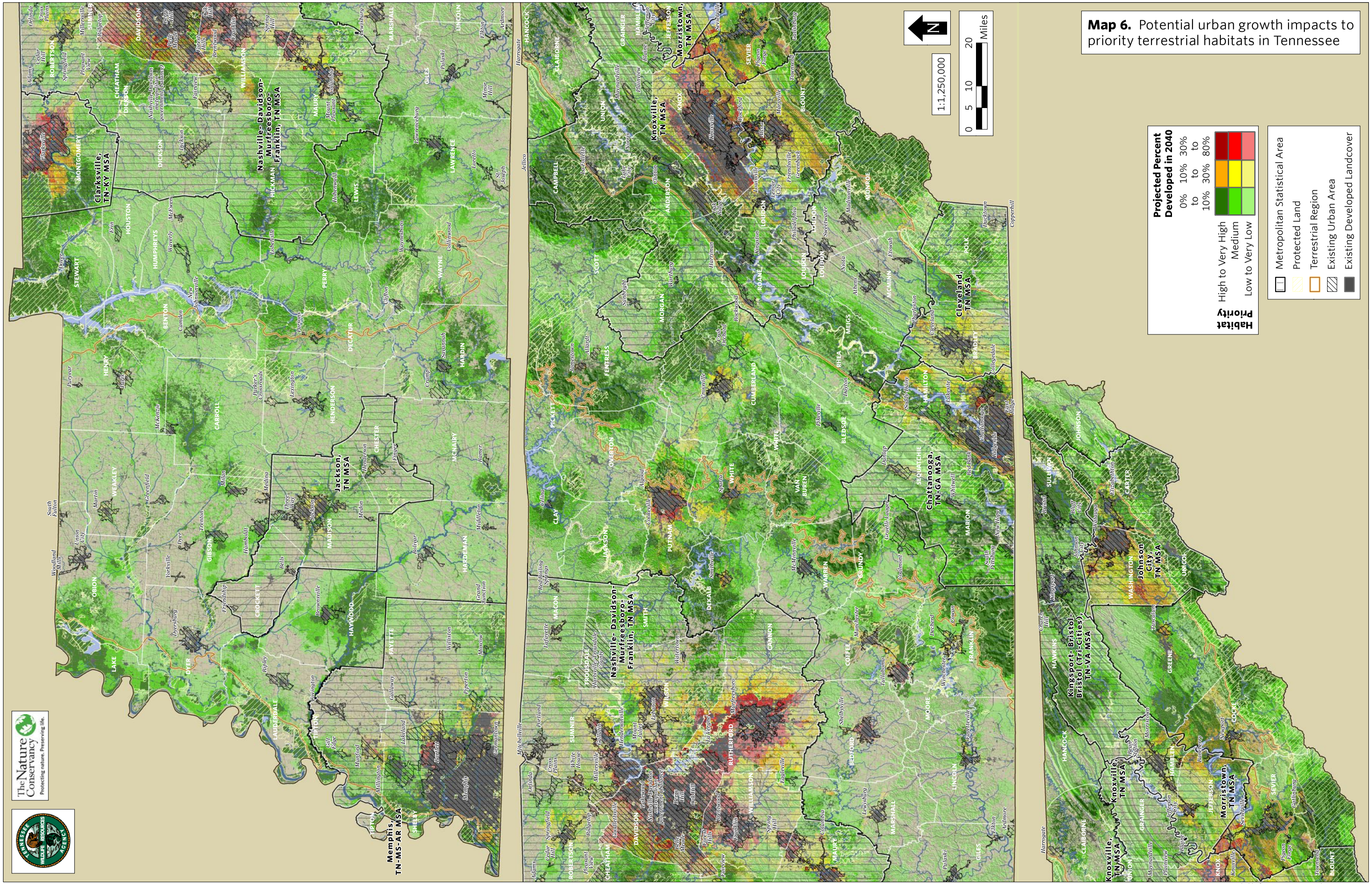
For the 2015 update, the SWAP team adopted a methodology developed by The Nature Conservancy (TNC) for examining the growth in urban land use footprints across Tennessee to accommodate our projected population through 2040 (Wisby and Palmer 2015). This methodology uses county-level population growth projections from the University of Tennessee's Center for Business and Economic Research; information on county and municipality urban growth and boundaries; and data on land features and proximity to infrastructure to determine which areas are likely to experience land conversion during the next 25 years.



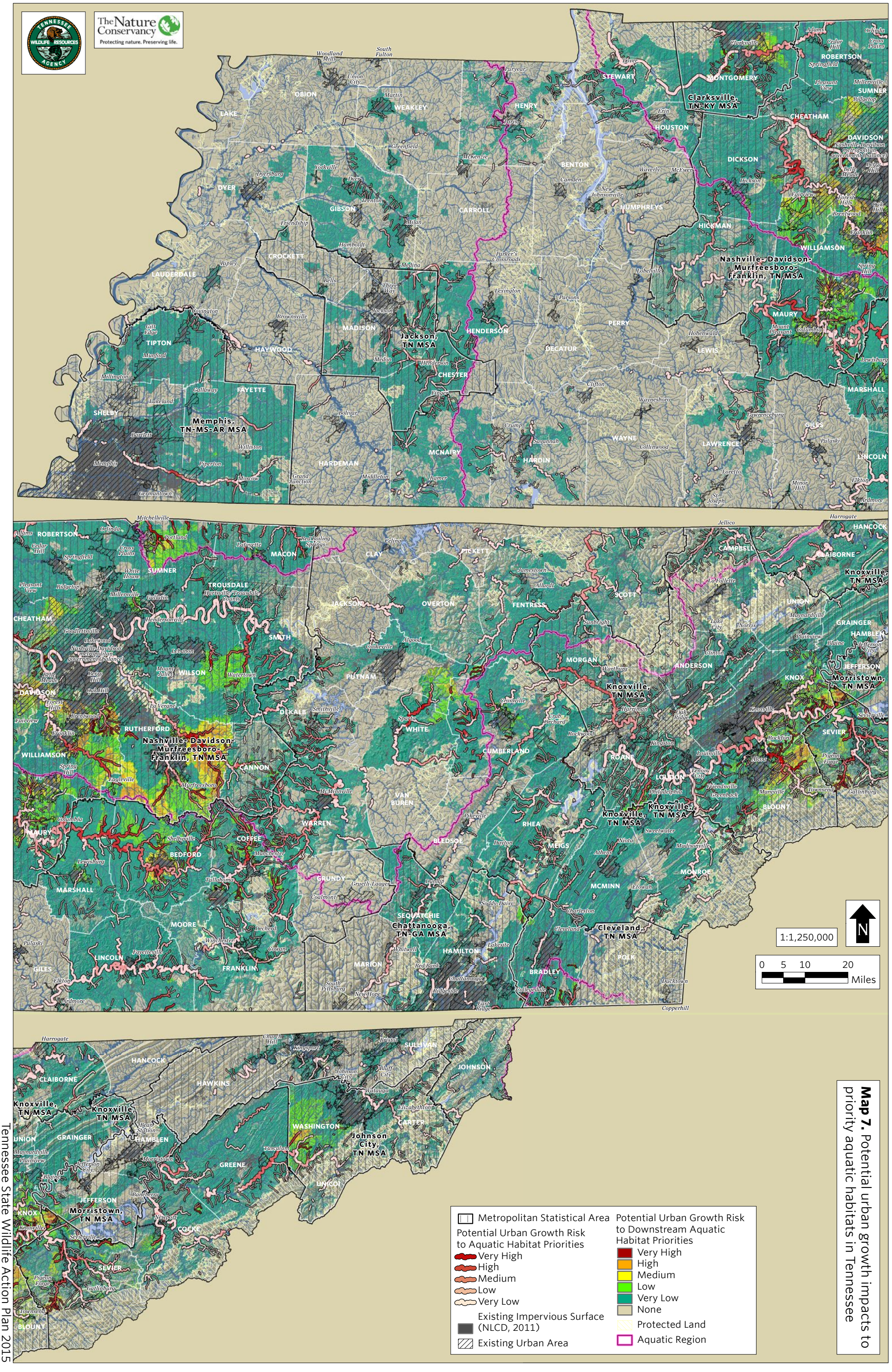
Nashville riverfront and skyline - Brad Montgomery

The results show the specific locations across the state where GCN habitats and species may be at risk without proper planning for habitat protection (Maps 6 and 7). These maps, and the underlying species and habitat data, can help inform decision-making so that natural resource considerations can be made in advance. While the potential expansion footprint may not appear visually large in some places, such as far eastern Tennessee, urbanization can result in localized habitat fragmentation effects that can interrupt habitat connectivity at larger scales. Maps 6 and 7 also show the boundaries of Metropolitan Statistical Areas (MSAs) of Tennessee (Figure 3). The maps group the ten MSAs of Tennessee into a smaller subset of 5 combined areas. For planning collaborations with SWAP conservation partners, the data can be analyzed and presented for

Map 6. Potential urban growth impacts to priority terrestrial habitats in Tennessee



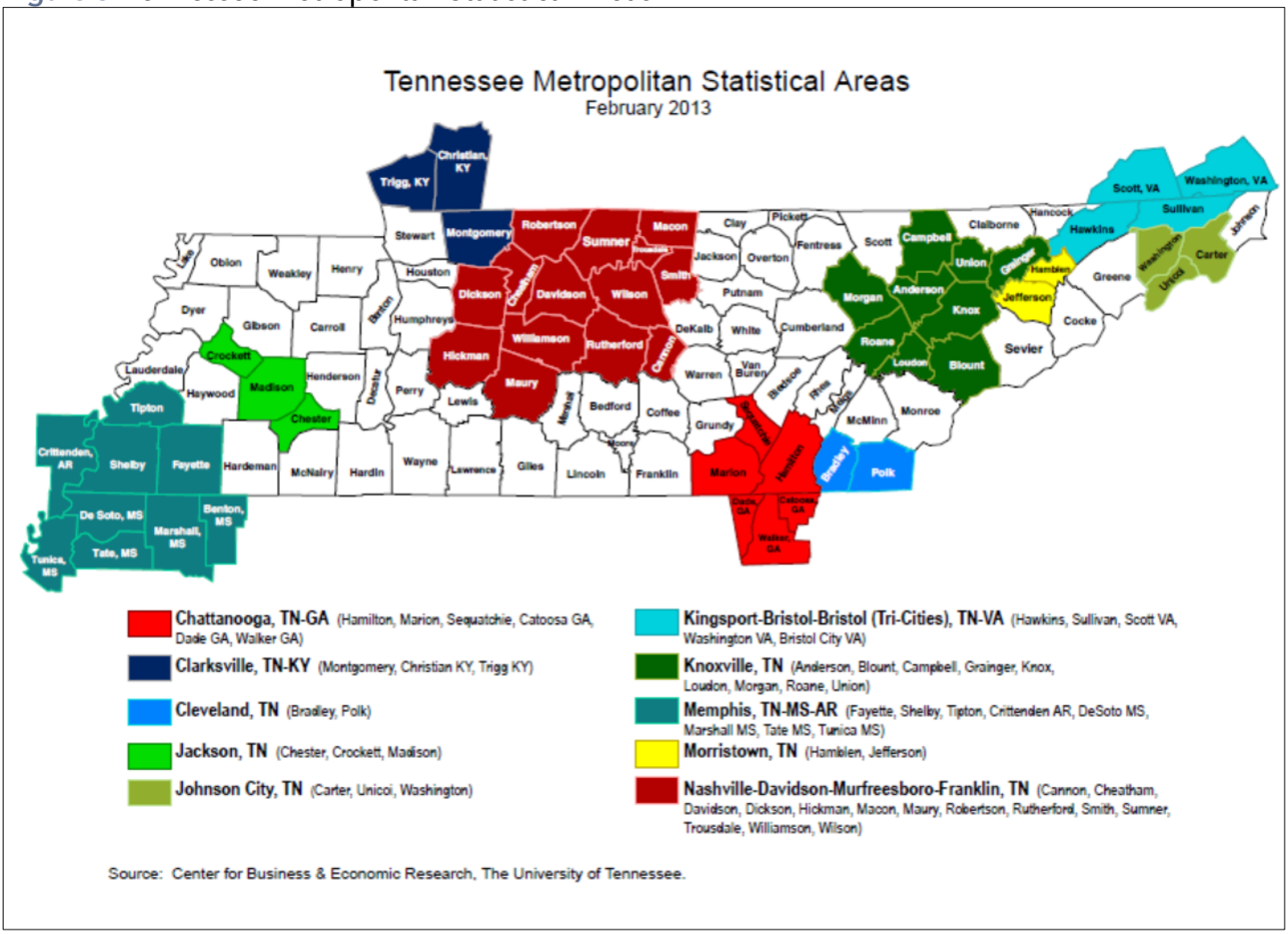
The Nature Conservancy
Protecting nature. Preserving life.



Map 7. Potential urban growth impacts to priority aquatic habitats in Tennessee

Tennessee State Wildlife Action Plan 2015

Figure 3. Tennessee Metropolitan Statistical Areas



any specific MSA or combination of MSAs at the desired spatial scale.

4.3.2. Agriculture

Agricultural conversion and incompatible agricultural management practices can, in some cases, pose challenges to sustaining certain wildlife and plant species in Tennessee. However, it is important to note that not all agriculture poses a threat to wildlife and plants. In fact, certain forms of agricultural management can be beneficial for wildlife and plant conservation or can be managed to lessen negative impacts. Many such practices are promoted through incentive programs for landowners administered by the U.S. Department of Agriculture, Natural Resources Conservation Service, and the Tennessee Department of Agriculture.

Impacts to Terrestrial Habitats

Agricultural land use can pose a threat to terrestrial species when important grasslands or forests are converted to cropland or pasture, contributing to overall loss or fragmentation of habitat. Loss of riparian habitat impacts GCN bird species such as Prothonotary Warblers, Swainson's Warblers, and many others.

Wetland habitats provide important services such as water filtration and groundwater recharge, and they provide critical habitat to many species at various points in their life cycle as well. As with so many wetland areas of the United States, these highly localized habitats have been vastly reduced, often as a result of drainage and clearing for agriculture (USGS 1997). Tennessee lost 59% of its wetlands from the 1780's to the 1980's, according to estimates by the U.S. Fish and Wildlife Service (Dahl 1990).



Prothonotary Warbler, a species that depends on riparian and bottomland habitats. Cynthia Routledge

Contemporary estimates of Tennessee's wetland area range from 640,000 to 1,400,000 acres. Wetlands are ecologically and economically valuable to Tennessee, despite making up a relatively small percentage of the state. Bottomland forests are the state's most common type of wetland, located primarily in the flood plains of rivers in west Tennessee. Major causes of wetland loss or degradation in Tennessee include

- agricultural conversions,
- logging,
- reservoir construction,
- channelization,
- sedimentation,
- urbanization

(USGS 1997).

Beginning with the introduction of genetically modified herbicide-resistant (HR) crops, herbicide use increased in the U.S. by 527 million pounds from 1996 to 2011 (Benbrook 2012). These increases occurred in states such as Tennessee, where the HR crops soybeans, corn, or cotton are grown. The use of herbicides on HR crops increased 31% nationwide from 2007 to 2008, to a large degree due to the spread of weeds resistant to these same herbicides (Benbrook 2009).

Milkweed and many other flowering herbs and shrubs that serve as sources of seed and nectar for birds and other pollinators have suffered collateral damage from the widespread use of herbicides, with one study in 2012 showing a direct correlation between declining Monarch Butterfly numbers and increasing adoption of herbicide tolerant soybeans and corn (Monarch Joint Venture 2015). Also, studies by Purdue University have shown that herbicides making their way into streams have the potential to adversely affect GCN species such as Hellbenders by altering growth and development of larval stages (Solis et al. 2007).

Impacts to Aquatic Habitats

Incompatible agricultural management practices are the number one source of damage to streams across



Water flows off a farm in Tennessee following a storm.
- Tim McCabe, USDA NRCS

Tennessee (see Table 14). One reason for this ranking is that Tennessee's overall landscape remains largely in some form of agricultural use or forest type. Management practices that can contribute to stream health impairments include removal of streamside vegetation; grazing livestock along stream banks with unrestrained access to the stream; poor farm nutrient, waste, and herbicide management; channelizing and dredging streams; and creating impoundments on streams or withdrawing excess amounts of water.

Poor farm nutrient and waste management practices can contribute to pollution by Escherichia coli (E. coli) pathogens, and nitrogen and phosphorus inputs to streams and rivers. An excess of nutrients results in a problem known as eutrophication in streams, which lowers the dissolved oxygen in water available for freshwater animals, including insects.

Of all the effects associated with incompatible agricultural practices, excess sedimentation from farm fields and eroding stream banks may well be the single most deleterious for freshwater GCN species in Tennessee. According to a USGS study of 20 streams in Tennessee's Eastern Highland Rim ecoregion, nutrient concentrations, stream gradient, width, and substrate embeddedness (the degree to which fine particles surround coarse substrates) were all related to cropland density in a particular watershed. However, results suggest that fish communities respond primarily, and negatively, to the cumulative effects of sedimentation (Powell 2003). Channelization of streams and rivers to increase land



A channelized stream in west Tennessee, South Fork of the Forked Deer River - Rob Colvin, TWRA

available for agricultural production is a major contributor to habitat impairments in western Tennessee.

Impacts to Karst Habitats

Tennessee is among a handful of states with the greatest number of springs (3000), most of which are associated with karst composed of limestone in middle and eastern Tennessee. Enhanced interactions between surface and groundwater processes occur in karst. The hydrological cycle begins with precipitation and surface water drainage into the aquifer, which can occur over the entire karst surface area. Caves are considered subsurface extensions of karst landscapes, with most caves forming at or just below the water table. Caves above the water table are tributaries to caves below the water table. Water percolating downward passes through caves, which serve as "natural pipes" and the water can often re-emerge at the surface as springs or seeps (Veni et al. 2001).

In rural and agricultural areas, karst aquifers are subject to contamination from a number of sources. Chemical fertilizers, pesticides, herbicides, and elevated pathogen concentrations can be flushed through soils into aquifers beneath farmland, pastures, and feedlots. In addition to the impacts of sedimentation listed previously, sediments can affect the flow of groundwater through karst and may also carry contaminants, making programs to minimize soil loss critically important for many karst areas.

Another practice common in rural areas is dumping of refuse, construction materials, and dead livestock into sinkholes. "Common harmful products include bacteria from dead animals; used motor oil and antifreeze; and empty herbicide, solvent, and paint containers. These substances readily enter the aquifer and rapidly travel to nearby water wells and springs. Few people would throw a dead cow into a sinkhole if they realized that the water flowing over the carcass might be coming out of their kitchen faucet a few days later." (Veni et al. 2001).



Water flows over steps into Arch Rock at Alum Cave in Great Smoky Mountains National Park - Patrick Mueller

Mapping agricultural land use and priority freshwater habitats

Improving agricultural management practices in

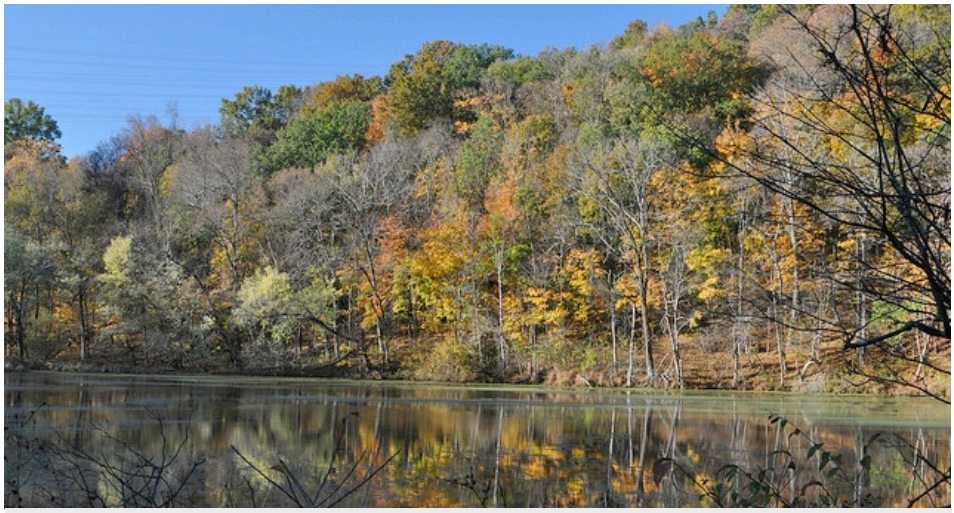
priority areas can improve outcomes for freshwater species of greatest conservation need and overall water quality across Tennessee. To better understand the scope of the challenges and opportunities, for the 2015 update the SWAP team used an approach developed by TNC (Wisby and Palmer 2015) to examine where across the state important watersheds for freshwater species conservation intersect with different agricultural land uses that may contribute to habitat or water quality degradation, if not managed to prevent such problems (see Map 8). The results show specific locations across the state where GCN habitats and species may be at risk without the use of agricultural best management practices, including sound management of Combined Animal Feeding Operations (CAFOs). It is important to note that these maps do not take into consideration where best management practices may already be in place; therefore, they are not representative of actual site-specific habitat conditions.

4.3.3. Forestry

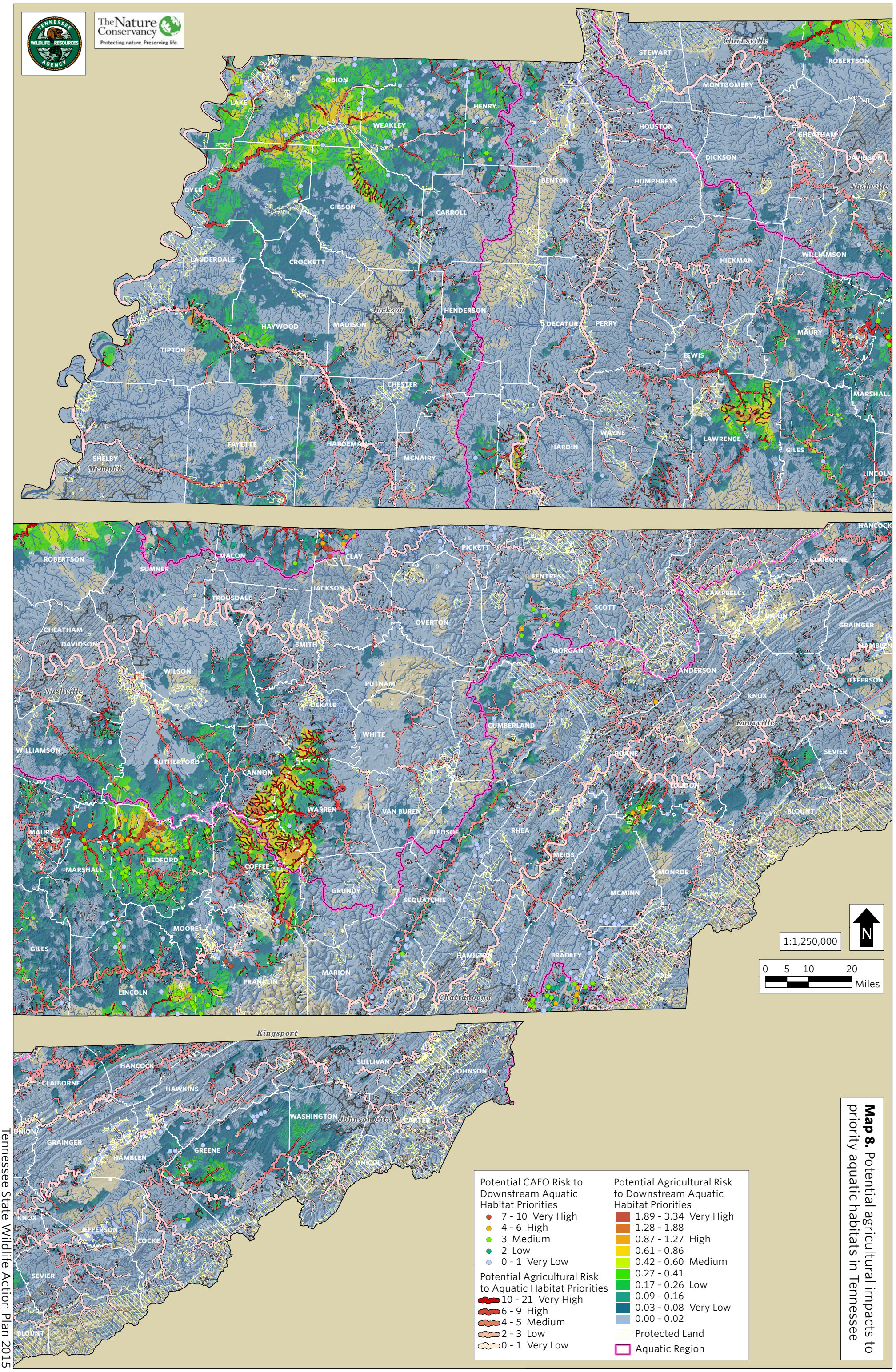
The Tennessee Division of Forestry developed its first Forest Resource Assessment and Strategy, also called the Forest Action Plan, in 2010. Where possible, it complements other state plans including the 2005 SWAP. Both plans identify problems facing Tennessee forests in the form of incompatible forestry practices that decrease forest habitat extent, alter habitat structure, and contribute sediment and nutrients to streams. All of these problems can negatively impact GCN species populations. Changing forestland ownership and increased parcelization present additional challenges to coordinated management and protection activities in many regions of the state (TDF 2010).

In terms of specific management practices, the lack of vertical structure in forests (i.e. understory, mid-story, and canopy development) is a threat to wildlife because a hardwood forest with structure supports a far greater diversity of wildlife than one without. This lack of structure is the result of little or no natural disturbance or intermediate management action, such as burning or thinning, over the life of a forest (TDF 2010).

Across the southern Appalachians, early successional habitats have been declining over several decades due to farm abandonment, changes in farming practices, urban



Diverse forest structure: wildlife generally respond to diversity - Greg Wathen, TWRA



Map 8. Potential agricultural impacts to priority aquatic habitats in Tennessee



The Yellow-breasted Chat is a GCN species that depends on early successional habitat. - Chris Sloan

encroachment, and the suppression of natural disturbances such as fire, flooding, and beaver activity. Species like the Golden-winged Warbler that depend on these habitats have declined over time, and their habitat restoration has become a priority (USFSb 2015).

Other potentially incompatible practices include high grading, clearcutting, pine monoculture, and use of exotic plants. In addition, high density, even aged, short rotation pine stands provide few wildlife or native plant benefits (TDF 2010; D. Lincicome, personal communication, Sep. 4, 2015).

Large timber harvests implemented without attending to BMPs designed to protect water quality, snags, and ground cover can directly impact wildlife, native plant populations, and habitats. In recent years, clearcutting and harvesting of the largest, highest quality trees (known as high grading) has occurred on both public and private lands. Maintaining the structure and diversity of old growth forest habitats and their connectivity across the landscape is critical to conservation of many GCN plants and animals. Without proper planning with respect to landscape-level habitat requirements for multiple species, including those dependent on different types of habitat, high grading practices can be detrimental as they lessen diversity in forest structure.



Logging road in Tennessee: best management practices help to mitigate erosion, concentrated flows, and sedimentation. - Chris M. Morris

Other negative effects of certain types of forest management include the following:

- Soil compaction and erosion;
- Impaired water quality from erosion, altered drainage patterns, and concentrated flows;
- Conditions that promote the establishment and spread of invasive species or insect pests (USFS 2015c).

Proper management of forest resources, including the promotion of landscape-level forest habitat health, helps protect a diversity of habitats for GCN species. It also promotes many other

beneficial forest uses, such as protection of public drinking water supplies, recreation opportunities, and local forest-product related economic activities (TDF 2010).

4.3.4. Water Management

Tennessee's rivers and streams provide habitat for some of the greatest diversity of aquatic species in North America (Smith et al. 2002, Master et al. 1998). For the last century, government agencies and private businesses have developed the state's water resources to provide flood control, river navigation, electricity, drinking water, agricultural improvements, and recreation benefits to Tennesseans as well as residents of neighboring states. While transforming state and local economic opportunities, the construction of dams and other water infrastructure has also fundamentally changed Tennessee's rivers and tributaries from their original interconnected, free-flowing conditions. Currently the best estimate for number of dams in Tennessee is 1, 721 (E. Granstaff 2015, personal communication, Aug. 11).

The flow regime of a stream or river system and the connection of a river to its tributaries is a highly significant factor in determining both the structure and function of aquatic and riparian ecosystems. An ongoing USGS study on stream flow and ecology in the Tennessee river basin has identified specific aspects of streamflow that influence fish community health and abundance (USGS 2013).



Streamflow: one of the key factors that determine the species composition and health of a stream. - Greg Wathen, TWRA

Dam construction can alter flow by turning river systems into a series of large pool reservoirs. Flow alteration as a result of dams both large and small has significant impacts on aquatic species, fragmenting the river network, impeding the movement of resident and diadromous fish species, and eliminating or altering in-stream habitat. By preventing many species of fish and invertebrates from accessing river reaches upstream and downstream of the structures, dams essentially disconnect populations from large sections of their habitat. In addition, dams pose threats to native aquatic systems by changing several key characteristics of the streams that occur downstream of reservoirs: natural flow patterns, dissolved oxygen, temperature, nutrient loads, and water chemistry.

Water withdrawals are also a concern if the timing or amount of withdrawal is sufficient to alter basic flow patterns and affect ecological

responses, posing a threat to aquatic wildlife and plants. Both channelization and upstream impoundments, which can affect flow patterns, are listed among the top ten sources of impairment to Tennessee river and stream health (TDEC 2012/EPA 2015) (See Table 14). In addition to reducing habitat for aquatic species, flow alteration can also affect water quality, water temperature, and water availability (USGS 2013).

Resource management challenges of large dams and reservoirs

Rivers below dams are commonly referred to as tailwaters or tailraces. Many hydropower and flood control dams, operated by the Tennessee Valley Authority (TVA) in the Tennessee River system and the U.S. Army Corps of Engineers (USACE) in the Cumberland River system, release cold water into the tailwaters. The cold water can degrade or reduce habitat for native fishes and mussels.

Likewise, some tailwaters are low in oxygen, especially by the end of the summer, because decaying organic matter in reservoirs uses up oxygen at the bottom of the reservoir, and the heavier, colder water does not mix with the surface. It is also these waters that are discharged from the dam. These are issues that TVA, USACE, TWRA, and the U.S. Fish and Wildlife Service (USFWS) have worked to address in recent decades, by creating flow regimes and improving downstream water quality to benefit at-risk and endangered species in key river reaches.

Since 1991, TVA has spent more than $60 million constructing capital projects to address the problem of low oxygen, installing a variety of equipment and technologies designed to increase dissolved oxygen concentrations below 16 dams. TVA also monitors key aspects of ecological health in the tailwater sections to achieve biological and recreation objectives (TVA 2015b).

In recognition of the importance of stream flows, TVA also changed their policy for operating the Tennessee River and reservoir system in May 2004. The policy now focuses on managing the flow of water through the system rather than storage. It specifies flow requirements for individual reservoirs, to prevent riverbeds below dams from drying out, and for the system as a whole. (TVA 2015b). Their operations



Lake Sturgeon below Douglas Dam on the French Broad River. Once extirpated from the Tennessee River, in part due to hydroelectric dams, Lake Sturgeon are making a comeback due to TVA's Reservoir Releases Improvement program. - Bart Carter, TWRA

now maintain wetted habitat in 180 miles of river that previously were intermittently dry (Yarbrough 2013).

Similarly, the USACE has conducted watershed assessments in key watersheds where they operate. These are collaborative processes with state, federal, tribal, interstate, local government, and stakeholder organizations that produce watershed plans to balance needs for water supply, public safety (flood control), wildlife habitat, and aquatic diversity (USACE 2015).

In some cases, agencies recognize that cold tailwaters are inevitable and present an opportunity to provide a sport fishery. Because cold water released into the tailwaters below dams creates a new type of habitat, TWRA stocks trout to diversify the state's angling opportunities. TVA's monitoring program on the Elk River allows the agency to adjust the operation of Tims Ford Dam to protect the variety of life in the river, including a cold-water trout fishery, endangered species, and sport fish that require warm water (TVA 2015b).

Resource management challenges of small dams and stream barriers

Even small impoundments, which are constructed on smaller or headwater streams for various reasons, have the potential to adversely affect aquatic life. Such impoundments eliminate flowing stream habitat in the flooded pool zone, making habitat unsuitable for native stream species. These dams also may alter the physical, chemical, and biological components of downstream reaches. They create barriers that can result in isolated populations, and with no provision for minimum flows, they may result in insufficient flow downstream, particularly during summer months (Arnwine et al. 2006).



Even small dams create barriers and can alter the flow, chemistry, and biology of areas both up and downstream. - Chris Simpson, TWRA

All of these factors combined are a recipe for reduced biotic integrity, altered flows, and negative impacts on water quality downstream of the impoundment. Results from one study indicate that small impoundments affect the biological community for at least one-quarter mile downstream (Arnwine et al. 2006). As recognition of these impacts has grown, momentum has increased among a variety of constituents across the country to remove dams, particularly those that no longer serve their original purpose or that pose significant threats to public safety.

Negative impacts of stream and river channelization

Channelization of rivers and the use of levees and dikes to prevent flooding in former natural floodplains are two major contributing factors to the imperilment of many GCN fish species, particularly within the Mississippi River

and its tributaries in western Tennessee. Straightening streams means removing the meanders that produce habitat structure in the form of pools and riffles, which are essential to a diversity of fish and other aquatic life. Channelization can also lead to greater erosion and sedimentation (TWRA and USFWS 2002).



Channelization and associated silt load in the Forked Deer River system in Madison County - TWRA staff

Channelization has hurt the following species in west Tennessee:

- ***Alligator Snapping Turtle***
- ***Alligator Gar***
- ***Lesser Siren***
- ***Smallmouth Salamander***
- ***Piebald Madtom***
- ***Pink Mucket Mussel***
- ***Orangefoot Pimpleback Mussel***

Disconnecting streams from their floodplains through channelization, levees, or dike construction can cause the following problems (TWRA and USFWS 2002):

- loss of sediment;
- deposition outside of the streambed;
- decrease in groundwater recharge;
- elimination of spawning and nursery habitat for fish and amphibians.

4.3.5. Energy Development

Non-renewable energy development

Resource extraction for non-renewable energy sources includes mining for coal as well as drilling for oil and natural gas. These activities can involve significant impacts to natural habitats. Without proper advance planning, management, and mitigation, they can cause long-term and even irreversible damage.

Coal Mining

Coal mining activities, from site preparation to post-mining impacts, can introduce a spectrum of problems for GCN species and their habitats. A 2002 Clinch and Powell Valley Watershed Ecological Risk Assessment conducted by the EPA analyzed associations between land use and in-stream habitat and their effects on fish and mussels. Their findings show that coal mining activities can cause "unacceptable losses of valuable and rare native fish and mussels." (EPA 2002).

Forest loss can fragment habitat and severely affect interior forest-dwelling birds and other species. A current

threat facing the region is that of mountaintop removal coal mining, which even with reclamation leaves landforms permanently altered (SELC 2015).

The Cumberland Plateau and Mountain region of Tennessee has experienced decades of long term environmental impacts from coal mining, including problems associated with contour mining, deep mining, cross-ridge mining, and re-mining of areas. Such activities destroy terrestrial habitats and permanently disrupt and degrade the hydrologic and ecologic function of surrounding forests, spring seeps, streams and riparian zones. These activities also disrupt and degrade the ecological function and connectivity of ridgeline habitat corridors.

Coal mining conducted prior to the passage of the 1977 Surface Mining Control and Reclamation Act (SMCRA), which required post-mining site repair activities to take place, left clear cuts, polluted rivers, and unstable slopes in their wake. Issues from older abandoned mines that were either never reclaimed or improperly reclaimed have degraded both water quality and aquatic wildlife diversity. (EPA 2014c).

For example, in the Big South Fork National River and Recreation Area, numerous abandoned coal mine sites are found throughout the park. These sites have become sources of contaminated water affecting the river and its tributaries (NPS 2014). The Office of Surface Mining, Reclamation and Enforcement's **Abandoned Mine Land Inventory System** lists 290 problem areas in their database for Tennessee. An additional land management challenge in Tennessee comes from the "split estate" ownership status separating subsurface mineral rights from surface rights. Even in many cases where the state or federal government protects and manages the land surface, the mineral rights may be privately owned. According to the U.S. Bureau of Land Management, in these situations, "the mineral owner must show due regard for the interests of the surface estate owner and occupy only those portions of the surface that are reasonably necessary to develop the mineral estate." (BLM 2015). Maps 9 and 10 demonstrate where currently permitted coal mining activity intersects with priority GCN species habitats in Tennessee. Collaborative planning and management at site and regional scales may help reduce the potential for negative impacts.



Big South Fork acid mine drainage - NPS

Oil and Gas

Both public and private lands in the Northern Cumberland Mountains and Plateau region have experienced historic impacts from oil wells and are now facing new challenges from natural gas developments. Big South

Fork National River and Recreation Area and Obed Wild and Scenic River have over 300 private oil and gas operations. "Many of the past and existing oil and gas operations in these NPS units are adversely impacting resources and values, human health and safety, and visitor use and experience; most are not in compliance with federal and state regulations." (NPS 2012).

In 1994, 82 percent of Tennessee's total oil production, and 60 percent of its total gas production,



Big South Fork acid mine runoff into a stream-National Park Service

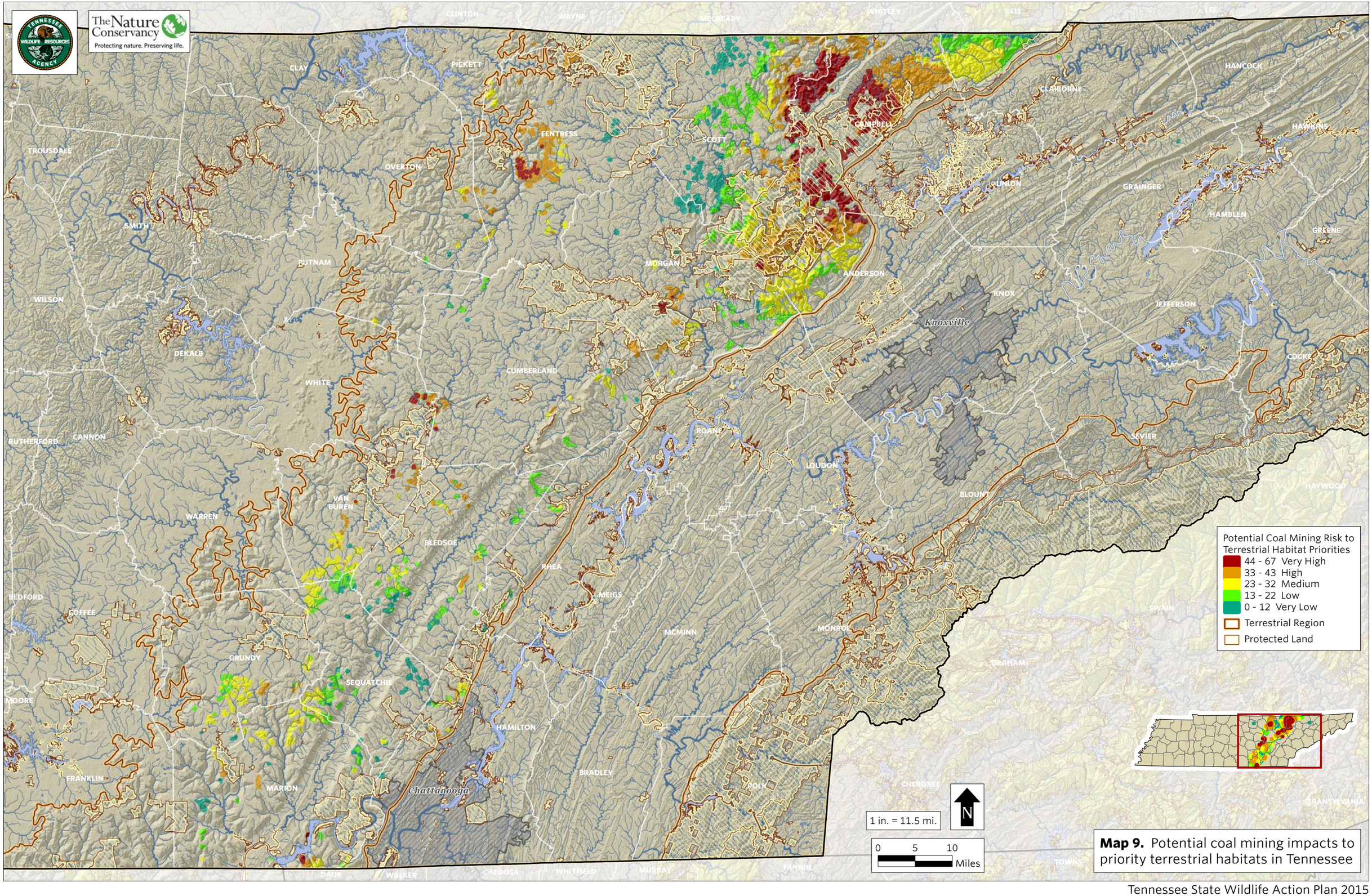
came from counties within the watershed of the Big South Fork River. By 2006, 50% of Tennessee's total oil production and 99% of its gas production came from these same watershed counties (NPS 2012).

The National Park System's Oil and Gas Management Plan for these areas states that many of these operations are not in compliance with federal and state regulations. The plan is a strategy to help park managers ensure their park units are protected from current as well as potential future threats from new development. The plan provides park-specific guidance for oil and gas owners and operators who wish to establish new oil and gas extraction sites (NPS 2012).

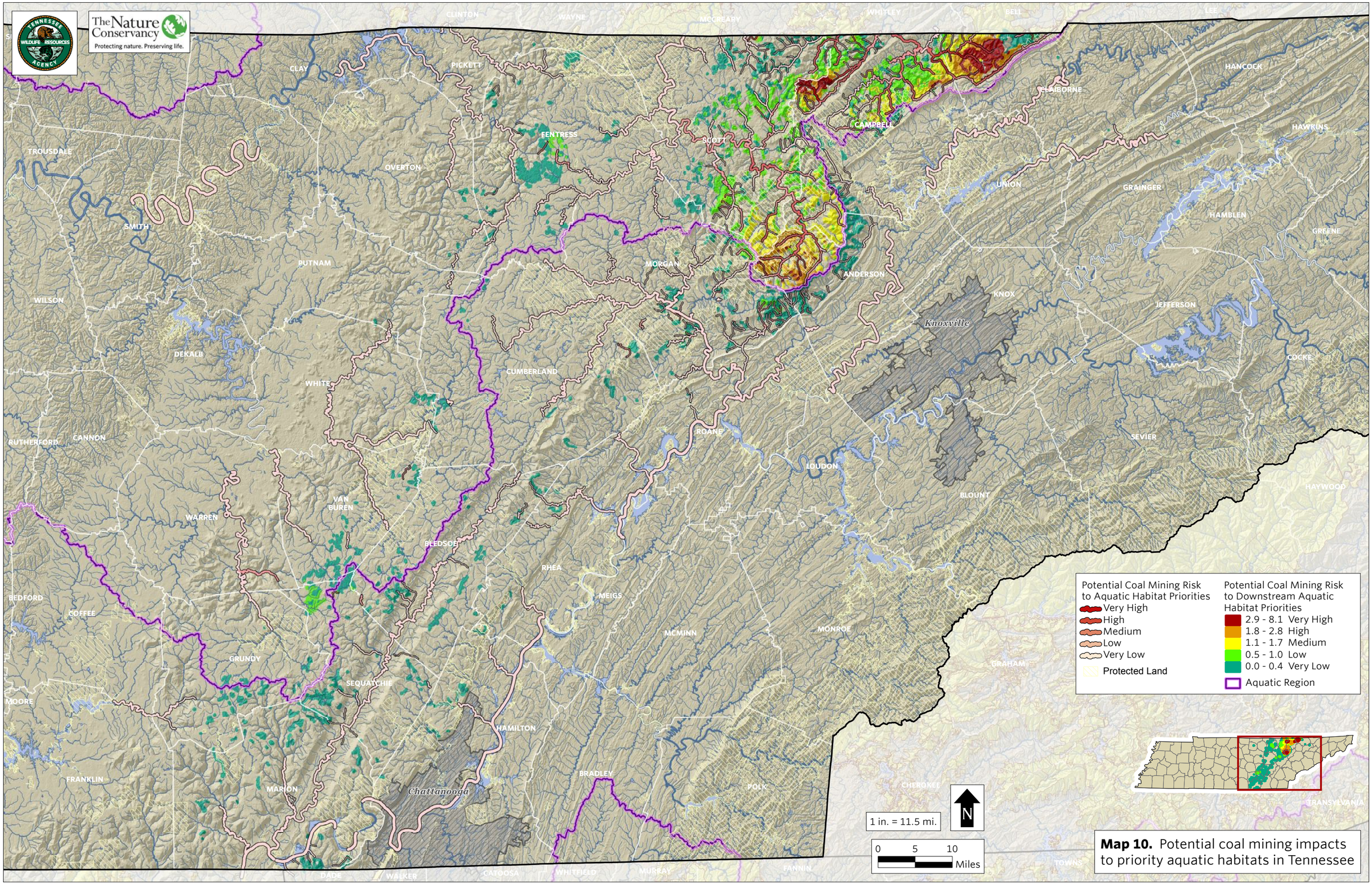
Different processes for extracting natural gas have raised concerns about potential negative impacts to both surface streams and groundwater affecting both freshwater species and overall water quality (Entrekin et al. 2011). In addition to the drilling process itself, the infrastructure development associated with production -- particularly new well pads, pipelines, and roads -- poses a major challenge to long term forest habitat integrity, both locally and across broader landscapes where production is increasing (Drohan et al. 2012, Fisher 2012). Tennessee has yet to experience the landscape-scale level of development similar to other states such as Pennsylvania; however, Tennessee does retain natural gas resources that are currently being developed and may be developed more in the future. Maps 11 and 12 demonstrate where permitted oil and natural gas activity intersects with priority GCN species habitats. As with potential coal mining impacts, use of these data in a collaborative planning framework may help reduce negative outcomes for species.

Renewable energy development

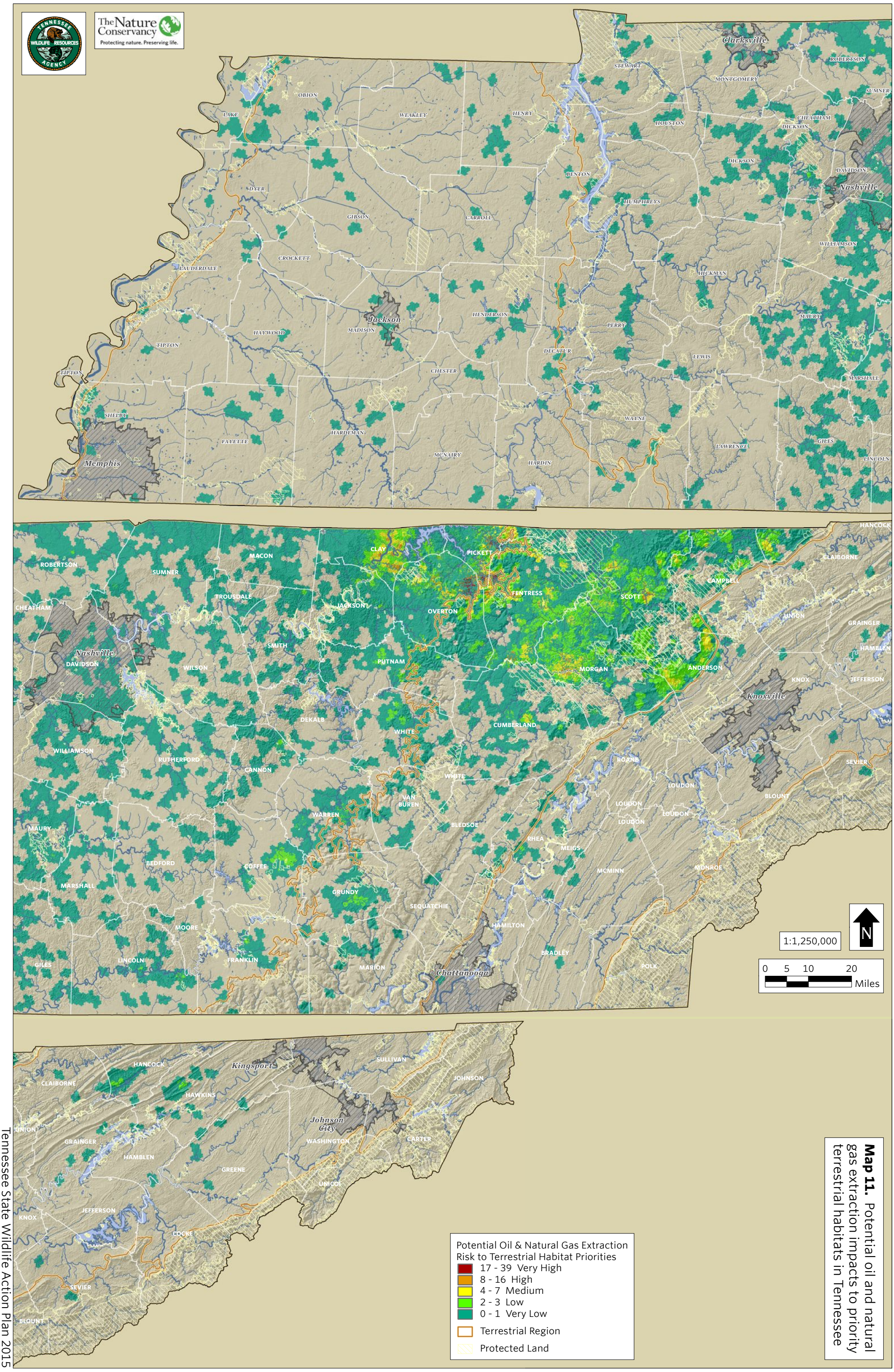
The development of renewable energy resources is receiving increased attention and study across the U.S. Renewable sources such as wind, solar, and biofuels/biomass, are currently being developed at smaller scales across Tennessee. Hydropower, also considered a renewable source, has been a significant provider of peak electrical power for many decades.



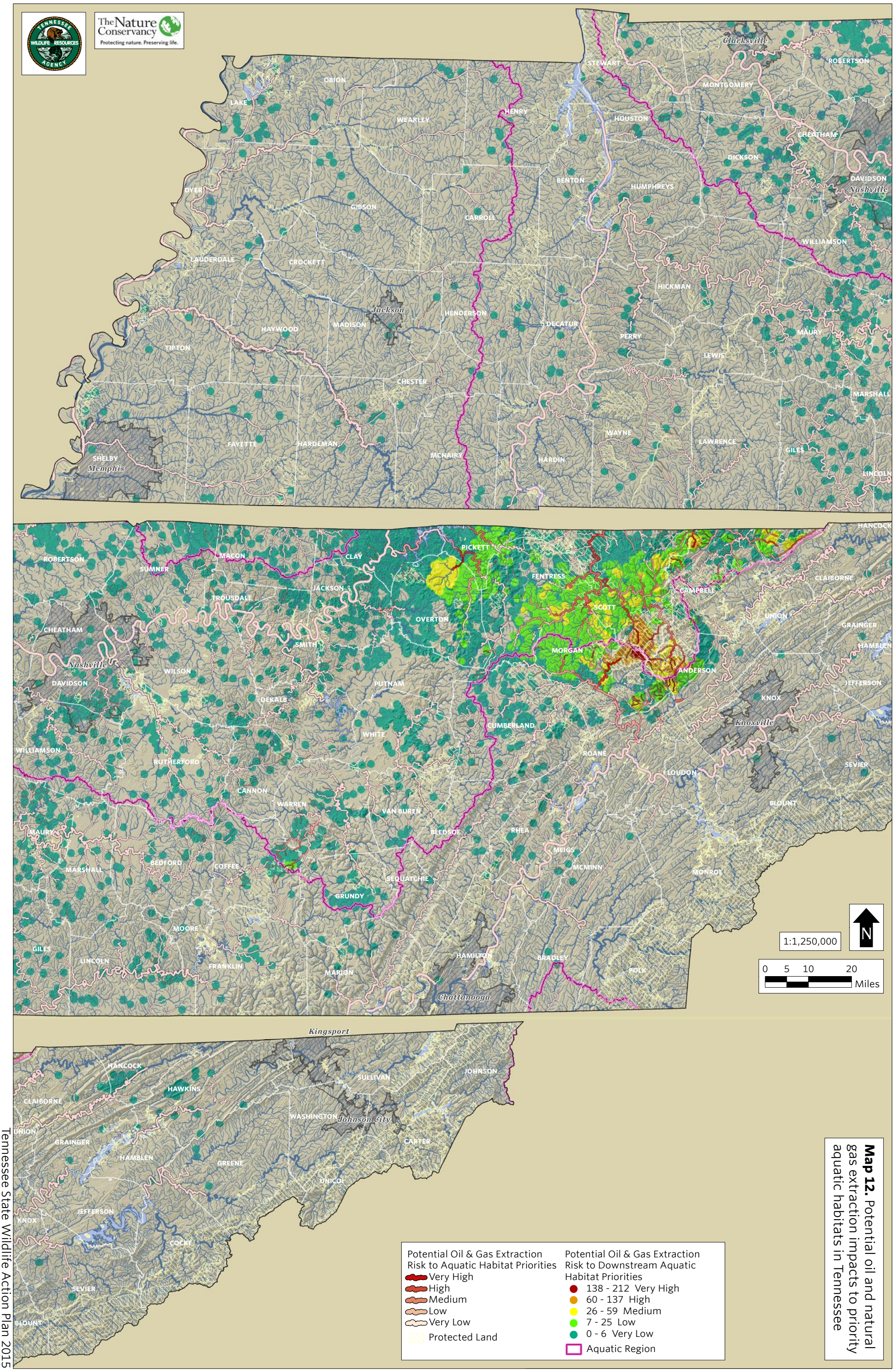
Map 9. Potential coal mining impacts to priority terrestrial habitats in Tennessee



Map 10. Potential coal mining impacts to priority aquatic habitats in Tennessee



Map 11. Potential oil and natural gas extraction impacts to priority terrestrial habitats in Tennessee



Map 12. Potential oil and natural gas extraction impacts to priority aquatic habitats in Tennessee

Tennessee State Wildlife Action Plan 2015



Switchgrass grown at the Power Plant Garden of the National Arboretum - USDA

Each type of renewable source has its own potential conflicts with species and habitat conservation needs. Well-designed approaches for overall land uses need to consider the potential of the land for all human needs as well as for biodiversity protection, placing each use in its most suitable location. Primary considerations for all renewable energy development types include eliminating or reducing direct species impacts, habitat losses, and fragmentation of habitat across the landscape.

Bioenergy

Biofuels (liquid fuels) and biomass (solid fuels) are both forms of renewable energy derived from biological materials, such as plants, vegetable oils, forest products, or waste materials. A 2010 analysis of the implications of biofuels for land use and biodiversity points out that perennial bioenergy crops could be considered an appropriate component of conservation farming systems when their use is integrated with land use planning along with rotations that improve soil quality, reduce erosion, and minimize runoff of agricultural inputs (Dale et al. 2010). Several species of perennial warm season grasses, such as switchgrass (native to the North American prairie from the Gulf of Mexico to Canada) provide excellent wildlife habitat.

Continued crop breeding innovations will almost certainly expand the range of growing conditions for bioenergy feedstocks, making even more areas that are important habitats for wildlife suitable for agriculture. Also, while native warm season grasses do provide excellent habitat, the design of production fields for biofuels may not be structured to provide the spacing and pattern of habitat needed on the ground. Thus, the risk of conversion to cropland in such areas merits special attention, protection, and planning (Dale et al. 2010).

Within the last decade, more research and development projects have been directed toward understanding the potential of forest biomass to supply alternative energy sources. The U.S. Forest Service anticipates that woody biomass can help replace up to 30 percent of petroleum consumption by the year 2030 (USFS 2010). Harvesting of forest products is also seen as a positive mechanism for improving overall forest health while



TVA windmills atop Buffalo Mountain-Michael Hodge

providing woody biomass for fuels (USDA 2014). Proper planning and utilization of these management practices in forests will be important for conserving terrestrial and freshwater habitats at both local and landscape scales

Wind

Improperly sited or operated wind turbines can directly affect native plant populations and wildlife, particularly birds and bats, especially during aerial migration at distinct geographic locations (Fiedler 2004, Nicholson et al. 2005). Negative effects can include direct mortality of animals, habitat loss, and habitat fragmentation. Birds and bats can be attracted to wind turbines by different lighting or operational features, and management attention to such features is warranted (Nicholson et al 2005). At present, wind production does not provide a significant portion of Tennessee's alternative energy portfolio. If facilities are to expand, considerations of cumulative impacts on population sizes and species ranges should be made (Fiedler 2004).

Hydropower

Finally, increasing the capacity of hydropower is believed to be a significant source of renewable energy across the U.S. (National Hydropower Association 2010). However, as previously discussed, dam construction and operations, including hydropower and other water management practices, have already significantly degraded natural river habitats in Tennessee. Alteration of existing dam structures to produce hydropower or the construction of new hydropower facilities must be considered in the context of these historic resource losses and with an eye to preventing further species and habitat declines (Grimm 2002).

4.3.6. Transportation and Service Corridors

Roads and other forms of transport, whether for people, utilities, energy, or goods, can directly impact habitats by damaging sensitive ecosystems, fragmenting habitat, and creating barriers to movement of both species



Projected development to the year 2060 (shown in red) clearly shows linear branch development along roads in Tennessee-SLEUTH Projected Urban Growth dataset, GCPO LCC Conservation Planning Atlas



Perched culvert, impassable to small aquatic organisms. - Sam Beebe

and the natural flow of water in wetlands and riverine habitats. Transportation routes are responsible for linear branch development, and the construction of highways and roads can cause rapid outgrowth from urban cores. For these reasons they are commonly considered in forecasting urban sprawl (Bhatta 2010).

Improperly designed road crossings such as bridges and culverts can fragment stream habitats, cause erosion, prevent the migration of species throughout a watershed, and impact local abundance and species richness of fishes in a stream. For example, one study in West Virginia found that in stream sections located above impassable culverts, fewer than half the number of species and less than half the total fish abundance occurred when compared with sections upstream of passable culverts (Nislow et al. 2011). This suggests that simple monitoring protocols to detect differences in local abundance and species richness could serve as indicators of problem barriers. Consideration of these problems can lead to better advance planning to avoid streams, improve engineering designs, and promote the use of less problematic materials (Warren and Pardew 1998, USDOT-FHA 2007). The USFWS, TWRA, and TDEC have begun looking at this issue in-depth, with the intention of working with state, county, and municipal departments during scheduled road maintenance to replace barriers with **passage-friendly culverts** and crossings across the Tennessee landscape.



Small fish, such as the Chucky Madtom, can be affected by lack of connectivity and dredging. - Conservation Fisheries, Inc.

In river environments, dredging for navigational channel maintenance is a key issue, particularly on the Tennessee and Cumberland River mainstems. Dredging destroys or degrades river bottom habitats and bottom-dwelling species; it also stirs up sediment, affecting downstream habitats. For these reasons, both the U.S. Fish and Wildlife Service and TWRA have management

oversight requirements relative to dredging, monitoring, and relocating species to protect them from channel dredging on a regular basis.

4.4. Habitat Management and Biological Resource Use Challenges

4.4.1. Fire suppression

Many of Tennessee's upland systems, as well as some types of wetlands, have been shaped and maintained by periodic fire – a process that was historically maintained to a large degree by Native Americans. Decades of fire suppression have degraded these systems and have changed the human perception of fire and its role on the landscape. Many species of wildlife depend on the plant communities that develop following a fire, in particular birds dependent upon grasslands and woodlands (EGCPJV 2014).

In the Great Smoky Mountains National Park (GSMNP) fire suppression has occurred over the past 60 to 70 years; this is exacerbated by the construction of homes and cabins in the vicinity of the park. Lack of fire leads to fuel buildups in the form of heavy accumulations of dead wood and brush. Under drought conditions, this fuel can contribute to catastrophic wildfires that are bad for people, their property, and natural forest systems (NPS 2015d).

Prescribed fire (the controlled application of fire in selected habitat areas) is a management practice that can directly address the problem of altered fire regimes. Prescribed fire reduces the risk of wildfire and costs much less than wildfire. However, prescribed fire is not widely and publicly recognized, embraced, or supported as a beneficial practice. (EGCPJV 2014, TNPFC 2015). In Tennessee, restoration of oak and pine savannas and woodlands, native grasslands, and high-quality early successional habitat requires fire, although the application, timing, and intensity of fire needed differs depending on the natural system (Harper and Birckhead 2012).

Prescribed fire as a management practice is more practical and less controversial in some areas versus others. For example, at Arnold Air Force Base in the Barrens region of Tennessee's Eastern Highland Rim, prescribed fire has been incorporated into the management regime to benefit natural communities while also accomplishing a highly complex military mission. The prescribed fires are



Prescribed burn at Catoosa Wildlife Management Area - Clarence Coffey, TWRA (retired)

used to restore barrens habitat – Tennessee's prairie ecosystems – and to manage fuel loads in the Tennessee Army National Guard's weapons firing area as a means of preventing wildfire that interrupts training (DOD 2006).

4.4.2. Recreation

Tennessee's landscapes provide a wonderful array of recreational activities that contribute to the quality of life of both citizens and visitors, and which promote the state and local economies. Proper management of recreational activities in many situations



ATV, All Terrain Vehicle-Jassen

can be critical to promoting the protection of habitat and species, which in many cases are themselves one of the prime draws for visitors. A variety of recreational activities in natural area habitats can be detrimental, usually through the impacts of overuse.

One example is the growing concern that rock climbing, which has exploded in popularity in recent decades, could adversely affect the diversity of plant species that grow in specialized environments. The Obed River Gorge is a popular rock climbing destination, yet its vascular plants, bryophytes, and lichens make up one of the richest floras in the southeastern U.S. (Walker et al. 2009). Research on this topic indicated some impacts of foot traffic on vascular and non-vascular species, with a slight shift in lichen species composition on the cliff faces in response to climbing (Walker et al. 2009).

Another example is the importance of proper planning and management of horse riding trails. Studies have shown that damage to vegetation and stream water quality can occur when trails are not located properly, have maintenance issues, or are not properly followed by riders (Marion and Olive 2006). Good planning and maintenance can reduce potential damage and keep horse trails safe and enjoyable for the public.

The impacts of all-terrain vehicles (ATVs) and other recreational vehicles (RVs) can be significant in certain cases, but they are highly localized. TWRA allows restricted use on dedicated trails on some WMAs; however, the demand for trail access is growing. Without sufficient resources for signage and enforcement, this type of use in areas set aside for wildlife could pose a more significant threat. In addition, while most riders are responsible, as the number of riders coming from out-of-state is increasing, pressure on public and private lands will likely increase if greater density of use occurs.

Generally, people may not realize the extent to which ATVs and OHVs can damage the environment (TVA 2006). Mangled vegetation, destroyed wildlife habitats, severe soil erosion, and sedimentation of streams are the main impacts of ATVs and OHVs in sensitive or inappropriate areas, particularly when users blaze

new trails; do not use designated stream crossings; or even ride within streambeds. The damage caused to wildlife and water quality by riding in streams has caused some states like Missouri and Georgia to outlaw the activity.



Eastern Box Turtle, a species that is sometimes taken from the wild as a pet. - Ezra Freelove

4.4.3. Overuse of Biological Resources

The collection of particular plant and animal species in different regions of the state must be monitored, and regulations enforced, to prevent overharvest and species population declines. Illegal poaching of desirable plants, particularly medicinal species, from both public and private lands is an issue in Tennessee.

According to the Tennessee Department of Environment and Conservation, ginseng is the number one poached plant (Lincicome 2015). This species has historically been used for medicine by Native Americans and is still valued for this purpose, particularly for use in Asian products. Goldenseal and orchids also are highly popular species.

The trade of ginseng and many other plant species is regulated under **CITES**, the Convention on International Trade in Endangered Species of Wild Fauna and Flora. TDEC administers a **licensing program** to regulate and monitor the harvest and export of American ginseng from Tennessee, and collection of ginseng on the Cherokee National Forest requires a permit from the U.S. Forest Service.

In some cases, such as the collection of turtles as pets, the problem is part of a web of interrelated issues. For example, as development fragments habitat, Box Turtles near urban areas increasingly encounter humans, domestic pets, and automobiles -- all of which can lead to direct mortality, impacts to overall health, and removal of reproductive individuals from wild populations (Andrews et al. 2013). This is significant, as loss of adults can cause declines in turtle populations regardless of reproductive rates (Bowen et al. 2004).

4.5. Pathogens and Invasive/Exotic Species

4.5.1. Pathogens

Novel pathogens are a continuing and growing problem in Tennessee as well as other parts of the U.S. Emerging infectious diseases pose a growing threat to wildlife, yet appropriate actions to manage outbreaks before, during, and after invasion are only in the beginning stages. Researchers active in this field have proposed definitions for recognizable stages of pathogen invasion and means for control or treatment appropriate to each stage. However, one of the best means of addressing this threat will be prevention



Pathogen infection: Little Brown Bat with White-nose Syndrome - Dustin Thames, TWRA

at the federal level, through quarantine and trade restrictions on common vectors for the introduction of new pathogens (Langwig et al. 2015).

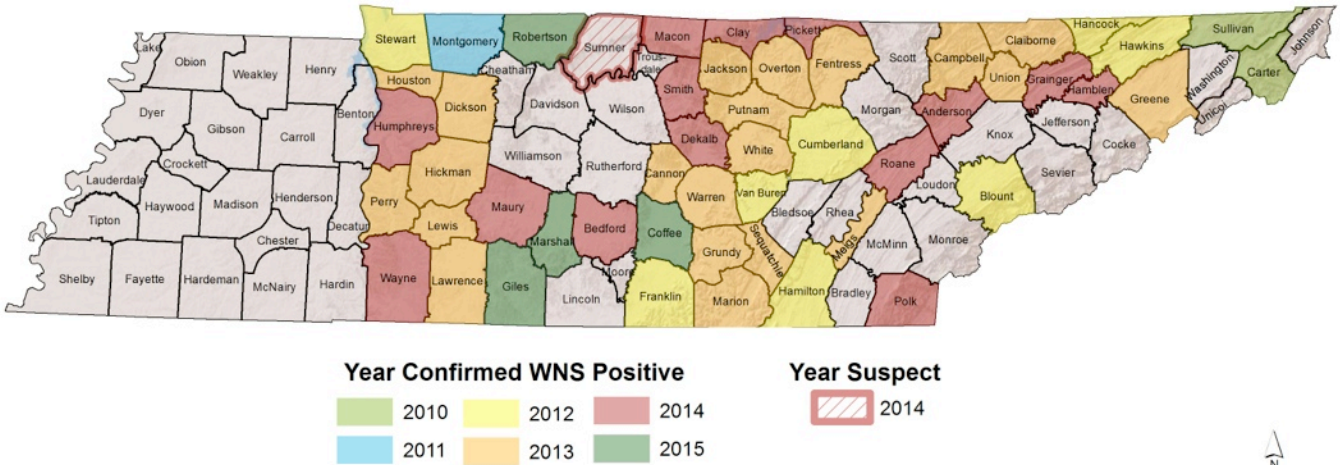
White-nose Syndrome

The challenge of White-nose Syndrome (WNS) in bats clearly illustrates how rapid, and devastating, pathogens can be. This disease had not even been considered a major problem in 2005, the date of first publication for State Wildlife Action Plans. WNS was first documented in New York in 2006-07 and has since spread across the eastern U.S. and Canada to more than 25 states and 5 Canadian provinces. TWRA confirmed the first case of WNS in Tennessee in February 2010.

Seven of the sixteen bat species that occur within Tennessee have been documented as having histologically confirmed cases. The syndrome is named for the characteristic white fungus (*Pseudogymnoascus destructans)* that causes white spots on the muzzle, ears, and wings of affected bats. Although it is not fully understood how WNS kills bats, the leading hypothesis is that infections arouse the bats during hibernation, causing them to exhaust their fat reserves prior to emergence in the spring. Essentially, they starve to death. Mortality rates differ among bat species (TNBWG 2014).

By 2014, WNS had killed more than 5.5 million bats in the U.S., and nothing has yet been effective in halting its spread. According to the Tennessee Bat Working Group, human transport of the fungus is probable, thus in 2009, the USFWS issued a cave advisory urging the closure of all caves and the implementation of a cave gear disinfection protocol to limit its spread between caves. In Tennessee, the National Park Service, The Nature Conservancy, Tennessee Wildlife Resources Agency, Tennessee Valley

Figure 4. Progress of White-nose Syndrome in Tennessee 2010 through 2015



Authority, Tennessee Department of Environment and Conservation, and the Tennessee Division of Forestry all had closed access to caves on their properties at the time (Lamb and Wyckoff 2010). Figure 4 shows the current distribution of WNS in Tennessee.

Chytrid Fungus

Another highly publicized threat is that of chytrid fungus (*Batrachochytrium dendrobatidis)* to amphibian species worldwide, including in Tennessee. Chytrid affects Hellbender salamanders (see Hellbender case study, Ch. 5). Both WNS and chytrid have caused mass mortality events and extinctions or extirpations in multiple species (Langwig et al. 2015).

Ranavirus

Ranaviruses are emerging pathogens of amphibians, reptiles, and fish, which have been associated with die-offs in the Americas, Europe, and Asia. With death rates often 90% or greater during an outbreak, as well as mounting evidence that some ranaviruses can be transmitted among all three of these vertebrate classes, these pathogens pose a substantial risk to Tennessee's biodiversity (Global Ranavirus Consortium, 2015).

Snake Fungal Disease



Snake fungal disease causes swelling, crusty scabs, or open wounds in snakes - Danny Bryan, Cumberland University

Another prime example of the pathogen threat is Snake Fungal Disease, an infection that has afflicted populations of snakes, primarily venomous species, from the northeast through the Midwest, and was recently discovered in Tennessee. This disease appears to be triggered by the fungus *Ophidiomyces ophiodiicola*, which is relatively new to science. At this time, it is not known whether this fungus has always been present in the environment, if it was introduced, or if perhaps it has recently mutated allowing it to cause more severe disease (NEPARC 2013). Researchers at University of Tennessee at Knoxville, Cumberland University, and Middle Tennessee State University have been working to document the spread of fungal infection in Timber rattlesnakes and other reptile species.

4.5.2. Invasive and Exotic Species

Invasive species, including both plants and animals, are a management concern across the state, along with the level of financial support and labor required to manage them. Invasive plants alter the composition, structure, and function of native ecosystems, while invasive animals can directly destroy habitat and reduce species populations through predation or competition. Intensive and extensive management is often required to prevent these undesirable ecosystem changes. Most invasive

species are introduced non-natives (i.e. exotic), though not all.

Invasive and exotic plants

According to a survey and research conducted by the Tennessee Exotic Pest Plant Council, invasive plants cost the state of Tennessee at least $2.6 million annually. This figure only includes direct costs of control, mapping, and outreach. It does not include indirect costs associated with:

- Decreased agricultural yields;
- Lower property values;
- Diminished recreational opportunity; or
- Decreased diversity and wildlife habitat.

(TN-EPPC 2015).

While there are many invasive plant species in Tennessee, the following examples illustrate some of the current threats they pose:

✦*Lespedeza cuneata* and *Lespedeza bicolor* are particularly difficult to deal with when using fire as a management tool, as they are tolerant of fire and may even respond positively. These introduced species replace



Lespedeza bicolor - Miya.m Wikimedia

native vegetation, alter wildlife habitat, reduce diversity, and can limit restoration options because they can prevent grass growth and tree establishment. (USFS 2015a).

✦*Microstegium,* a grass species introduced from Asia, and *Ligustrum sinense*, or Chinese privet, are both insidious invasive species problems. Once established, they can be resource intensive to remove or control.

Tree of heaven, kudzu, and multiflora rose also are examples of species categorized as severe threats that spread easily into native plant communities, displacing native vegetation. Of growing concern are Callery pear trees invading natural habitats, particularly in Middle Tennessee. The seeds of the parent – the cultivated variety Bradford pear tree - are not sterile, and when distributed by birds and other wildlife revert back to the more aggressively growing Callery pear.

Invasive and exotic insects

A number of invasive insect pests threaten Tennessee forests annually. These include the following, all of which are introduced with the exception of pine beetles:

- Hemlock Woolly Adelgid
- Emerald Ash Borer
- Southern Pine Beetle
- Gypsy Moth
- Asian Longhorned Beetle

(TDF 2015)



HWA infestation on hemlock-Nicholas A. Tonelli



Beetles that prey on HWA-Chris Simpson, TWRA

Figure 5. Hemlock Wooly Adelgid rate of spread

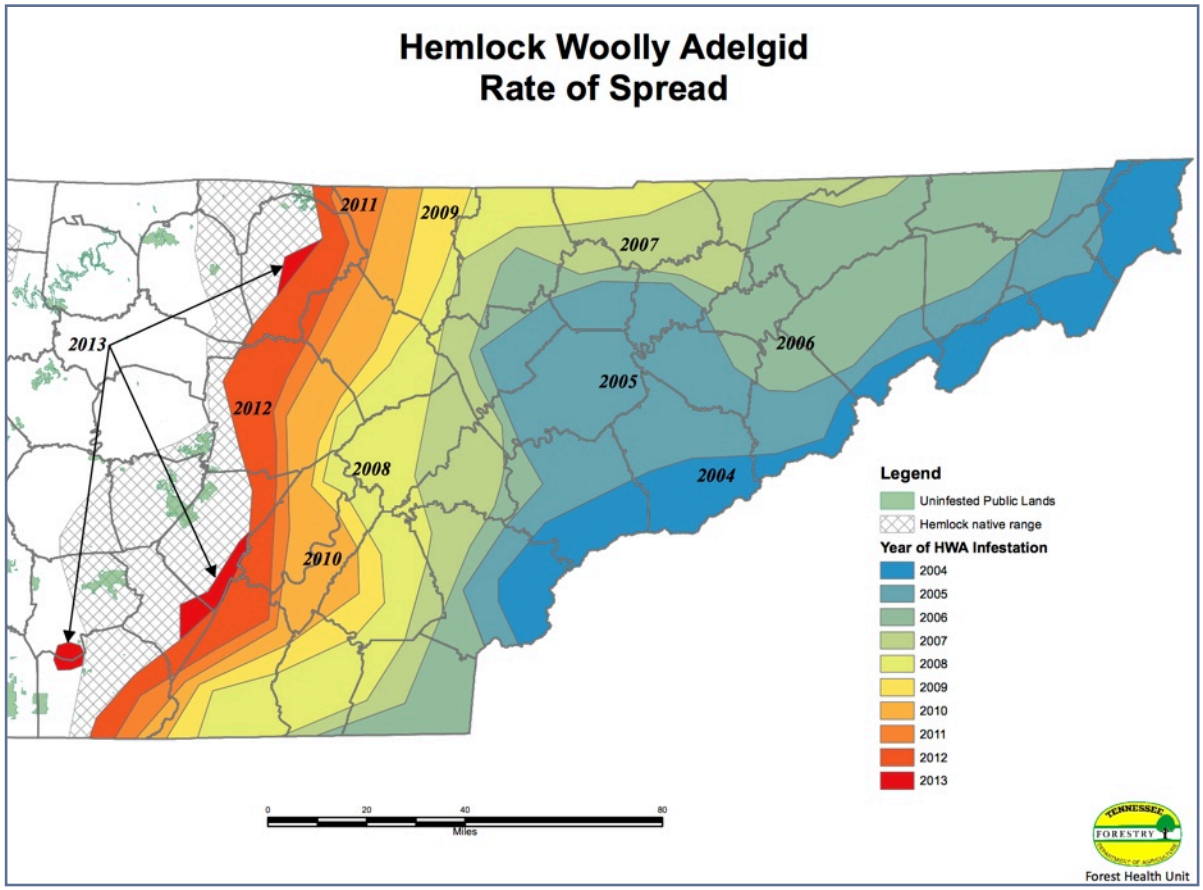
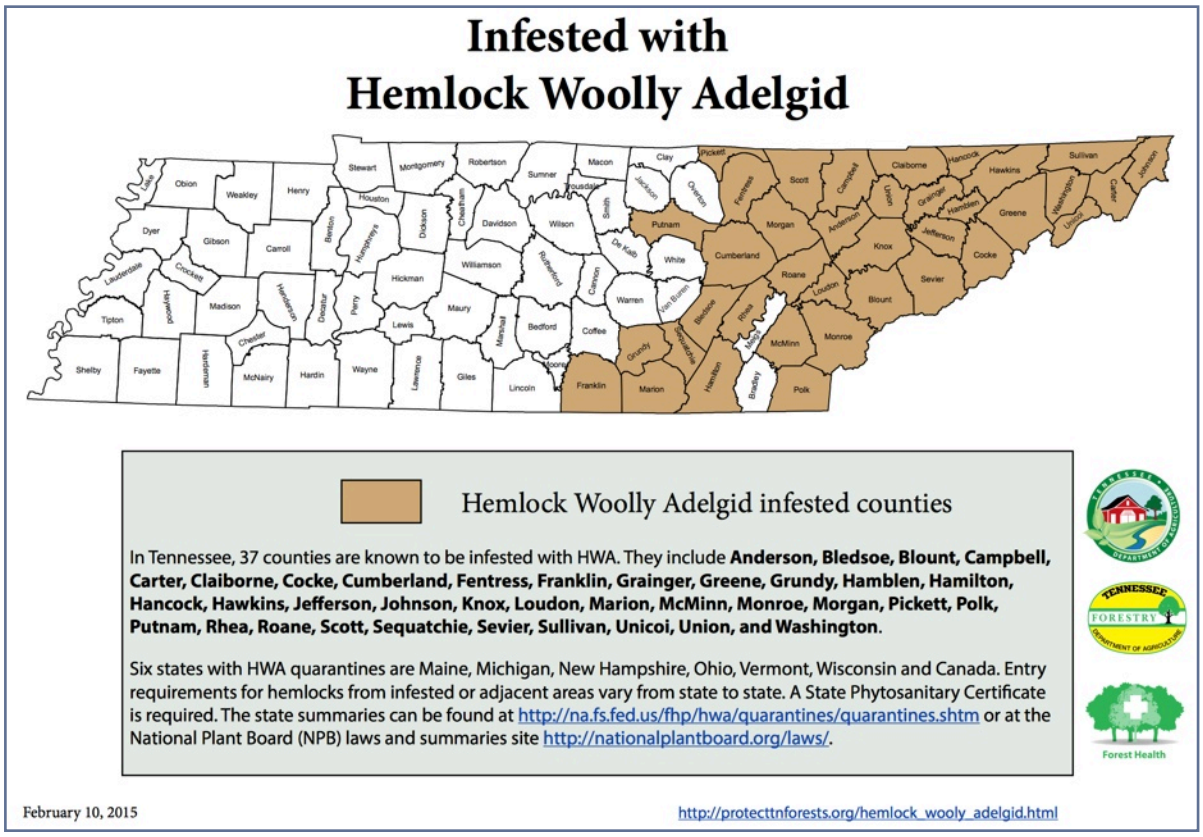


Figure 6. Tennessee Counties Infested with Hemlock Wooly Adelgid



The example of Hemlock Woolly Adelgid (HWA) serves to illustrate the issues surrounding invasive insects. Hemlocks are slow-growing, long-lived evergreens critical to the ecosystems in which they occur because they provide dense shade that helps to keep forest streams cool throughout the hot summer months. Since 2002, adelgids have been causing hemlock mortality, killing trees that are hundreds of years old in as little as three years. The HWA has caused extensive hemlock mortality in the Great Smoky Mountains National Park and the Cherokee National Forest. As of 2015, almost all counties in Tennessee with native hemlocks have these infestations (NPS 2015c) (See Figures 5 and 6).

While effective chemical treatments for these pests are available to individual landowners, they are cost prohibitive and impractical to address the problem on a landscape scale. Researchers and natural resource managers are working to find an effective mix of chemical and biological controls that can help protect some populations of hemlocks or slow down infestations (Wisby and Palmer 2015).

Invasive and exotic animals

Exotic animals pose similar problems to invasive plants and insects, and in addition they can directly impact native animal populations. Examples of current threats posed by exotic animals include:

✦Invasive crayfish are an issue in many areas of the state, as noted in the Tennessee Aquatic Nuisance Species (ANS) Management Plan (TANSTF 2008). Competition from both native crayfish (which are often transported across drainages in bait buckets and released into new areas of the state) and nonnative crayfish can displace or contribute to the decline of native species and overall diversity. Some species may hybridize with natives, and some also impact habitat through their burrowing activities or destruction of aquatic vegetation.



Crayfish burrow - Carl Williams, TWRA



Surgeon Crayfish - Carl Williams, TWRA



The non-native Kentucky Crayfish is invading Surgeon Crayfish habitat and negatively affecting their populations. - Carl Williams, TWRA

✦Silver Carp, also noted in Tennessee's ANS Plan, may be a problem for big river GCN species. Wild populations were probably originally the result of escape from aquaculture facilities or shipments mixed with grass carp. Silver carp compete for food with native plankton-eating species including Paddlefish, Bigmouth Buffalo, Gizzard Shad, the larval fishes of many species, and freshwater mussels. The noise of boat motors induce Silver Carp to leap out of the water, creating the potential for human injury or fatality. Commercial fishermen have abandoned fishing sites on the Missouri River due to the high numbers of Asian carp in their nets (TANSTF 2008).

✦Although Mosquitofish are widely introduced as mosquito control agents, according to the Tennessee ANS Plan, critical reviews of the literature do not support the view that they are very effective in reducing either mosquito populations or mosquito borne diseases. Depending on what they choose to eat, Mosquitofish introductions can lead to algal blooms or even cause an increase in mosquitoes. Mosquitofish are extremely aggressive and can affect native fishes through direct competition and often attack, kill, or eat other fishes. In Tennessee, they pose a threat to imperiled Barren's Topminnow (*Fundulus julisia*) populations in the few springheads where this species occurs (TANSTF 2008).



Damage caused by Wild Hogs, Bush Farm, Jefferson County - Scott Dykes, TWRA

✦Wild Hogs cause extensive damage to crops, wildlife habitat, and plant populations; contribute to erosion and water pollution; and carry diseases harmful to livestock and other animals as well as humans. Wild Hogs are prolific reproducers and do massive damage to the land through feeding and wallowing. They are also omnivorous, and will eat just about anything they can find. Wild Hog depredation can cause turkeys, ground-nesting birds, amphibians, and reptiles to suffer population decreases (Cox 2014). Wild Hogs also root up acres of land, including native plant populations, which requires significant time and money to repair. The damage that Wild Hogs cause has become more common and widespread, as they have gone from being present in 15 counties in 1992 (~16%) to nearly 84% of Tennessee's 95 counties in 2015.

4.6. Air Pollution

4.6.1. Acid Rain

Acid precipitation is caused by air pollution, primarily nitrogen oxides and sulfur dioxide from the burning of fossil fuels for electricity production and, to a lesser degree, nitrogen oxides in automobile exhaust. These chemicals react in the atmosphere to form nitric and sulfuric acids, which fall to earth as both wet and dry deposition (EPA 2012).

Decades of research have made it clear that acid rain causes slower growth, injury, or death of forests by:

- damaging leaves
- limiting the nutrients available to plants
- exposing plants to toxic substances that are slowly released from the soil.

(EPA 2012, USFS 2013)

Acid rain has contributed to forest and soil degradation in many areas of the eastern U.S., particularly high elevation forests of the Appalachian Mountains that include areas such as the Great Smoky Mountains National Park (EPA 2012). Acid rain, coupled with other problems such as invasive exotic species, pathogens, and climate change, has decimated Tennessee's high elevation spruce-fir forest. These forests provide important habitat for several rare and endangered species, such as the Spruce-fir Moss Spider (Gunnarsson and Johnson 1989, TWRA 2005).



Red Salamander (left) and Mud Salamander (right): amphibian and aquatic species are especially sensitive to acid precipitation. - Chris Simpson, TWRA

The effects of acid deposition in aquatic systems are no less severe. It causes a cascade of effects that harm or kill individual fish, reduce populations, extirpate fish species from a waterbody, and decrease biodiversity. In watersheds where soils do not have a buffering capacity, acid rain releases aluminum from the ground into lakes and streams, thus as acidity in a lake or stream increases, so does aluminum. Both increased acidity and aluminum are toxic to fish (EPA 2012).

According to TDEC, 41 miles of streams in Great Smoky Mountains National Park have very low pH (i.e. are very acidic). While all streams in the park are more acidic than they were 20 years ago, air quality is improving. Acidic streams are suspected to be the main cause for the decline of the native brook trout population in the park (NPS 2015a).

4.6.2. Ozone Pollution

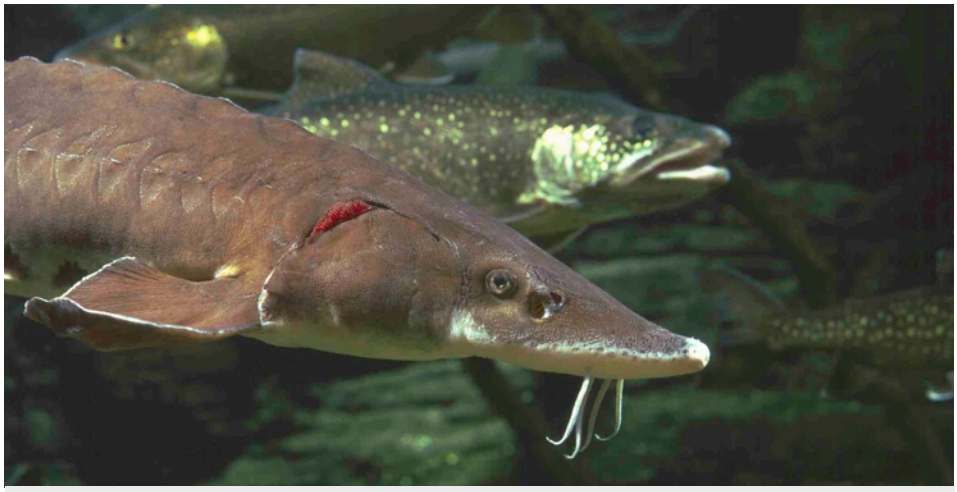
Ground level ozone pollution (as opposed to the protective stratospheric layer) is a problem in GSMNP and other regions of the state, and it derives from sources similar to those that create acid rain. Ozone exposure levels on park ridge tops are up to twice as high as those in Knoxville and Atlanta. These levels are sufficient not only to injure trees and plants, but also to threaten human health. Research has found that the following plants show signs of ozone damage in GSMNP: black cherry, milkweed, tuliptree, sassafras, winged sumac, blackberry, and cutleaf coneflower (NPS 2015b).



Auto exhaust contributes to ozone pollution - "biofriendly"

4.6.3. Mercury

Fish sampling surveys in the U.S. have shown widespread mercury contamination in streams, wetlands, reservoirs, and lakes, with 33 states -- including Tennessee -- having issued fish consumption advisories due to mercury contamination. Mercury is second only to PCBs as a pollutant impairing Tennessee ponds and lakes (TDEC 2012/EPA 2015). According to the USGS, the continental to global scale of mercury contamination is due to widespread air pollution (USGS 1997).



Concentration of toxins through biomagnification is most likely to occur in large long-lived fish, such as Lake Sturgeon, which can affect fish development and pose a threat to people who consume them. - Todd Stailey, Tennessee Aquarium

Levels of mercury measured in air and surface water are low. Nevertheless, they pose a threat because living organisms do not quickly excrete mercury, and it undergoes both bioaccumulation and biomagnification.

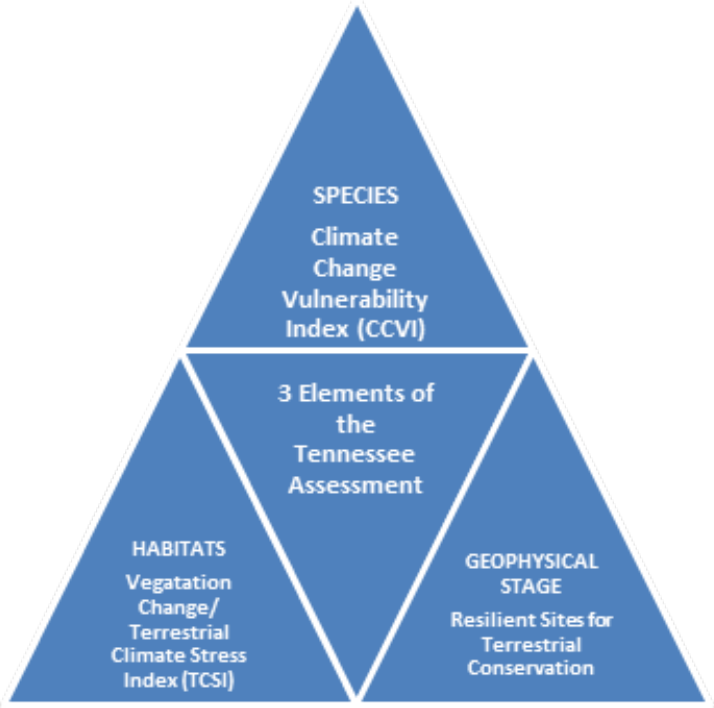
Bioaccumulation is the process by which organisms (including humans) can take up contaminants more rapidly than their bodies can eliminate them, causing mercury levels in their bodies to accumulate over time. Biomagnification is the buildup of contaminants through the food chain.

Coal-burning power plants are the largest human-caused source of mercury emissions to the air in the U.S., accounting for over 50 percent of domestically generated emissions; however, less than half of all mercury deposition within the country comes from U.S. sources (EPA 2014b).

4.7. Climate Change Vulnerabilities

The primary emphasis of Tennessee's updated climate vulnerability assessment was to use a multi-faceted approach and examine three major aspects of climate change impacts: species vulnerabilities, terrestrial and aquatic habitat changes, and landscape resiliency. Figure 7 summarizes these three major elements: assessment of *species* vulnerability using NatureServe's **Climate Change Vulnerability Index** (CCVI) (Young et al. 2011); assessment of terrestrial *habitat* vulnerability to climate stress including vegetation change; and evaluation of relative landscape resilience based on *geophysical settings* (Anderson et al 2014.) The focus on these elements together is intended to provide managers with a more comprehensive picture of climate change vulnerability by incorporating factors relevant to both species and habitats. The three-element approach is adapted from ideas piloted by the North Atlantic Landscape Conservation Cooperative for the Connecticut River watershed (NALCC 2014).

Figure 7. Three elements of the Tennessee Assessment



Details of the technical methods used in the assessment and results are provided in a 2015 SWAP companion report, *Climate Change Vulnerability Assessment for Tennessee Wildlife and Habitats* (Glick et al. 2015). The text and maps in the following sections are excerpted from this companion report to serve as a general overview of the results and application of the assessment work for informing further prioritization and strategy development during the 2015 SWAP update.

4.7.1. Species and Habitat Vulnerability Summaries

State fish and wildlife experts used NatureServe's **Climate Change Vulnerability Index** (CCVI) (Young et al. 2011) to assess a total of 189 GCN plant and animal species, including 15 mammals, 51 birds, 17 reptiles, 26 amphibians, 19 fish, 27 freshwater mussels, 8 crayfish, and 26 plants. Sixty-three percent (119) of the 189 species assessed scored as "Presumed Stable" or "Increase Likely," and 37% (70 species) were considered at least Moderately Vulnerable

(see Glick et al. 2015 for detailed species scores).

Mammals, birds, and reptiles comprise most of the species ranked as Presumed Stable or Increase Likely due, in part, to their mobility and



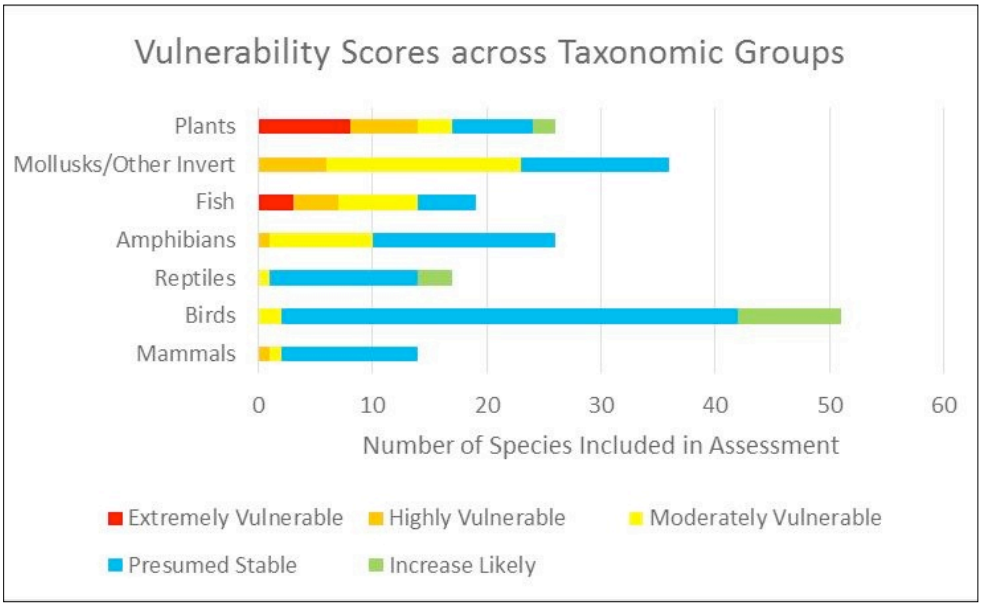
Brook Trout are coldwater species in Tennessee that may be impacted by warming waters. - Dave Herasimtschuk, Freshwaters Illustrated

other factors that enhance their adaptive capacity. Plants, fish, and mussels comprised the greatest number of species that ranked as Moderately, Highly, or Extremely Vulnerable for a variety of reasons, including the presence of natural and anthropogenic barriers to dispersal, restricted habitat range, and high levels of sensitivity to changes in temperature and moisture. Figure 8 provides a comparison of the CCVI vulnerability scores summarized across taxonomic groups. For more specific information on the scoring process and results, see Glick et al. 2015.

Some of the most significant impacts of climate change on Tennessee's fish and wildlife species will be associated with potential changes to their habitats. Notable impacts include the following:

✦Changes in the composition of plant communities in both forest and grassland systems, particularly in the western portion of the state;
✦An increase in the frequency and severity of disturbances such as wildfires and outbreaks of already-problematic species such as Southern Pine Beetle (*Dendroctonus frontalis*) and Hemlock Wooly Adelgid (*Adelges tsugae*);
✦Shifts in the location and extent of suitable habitat for fish and other aquatic species due to higher water temperatures and altered water quality, with areas of coldwater habitat in mountain streams likely to decline and warmwater habitat projected to expand;
✦Changes in the timing and magnitude of streamflows and other hydrological conditions, including increased drying of ephemeral pools important to amphibians and other

Figure 8. **Comparison of CCVI vulnerability scores across taxonomic groups. (For more specifics on the scoring process and results, see Glick et al. 2015.)**



wildlife. Appendix F provides a summary factsheet of potential climate change impacts and strategies for Tennessee.

Given the complexities and uncertainties in climate projections and associated impacts, the general challenge for managers may be to consider how to transition Tennessee from its current mix of terrestrial habitats to a different mix without losing biodiversity (Joyce et al. 2008). The state's upland forest systems, for instance, support a great diversity of wildlife due in part to the variety of different habitats and niches found within a structurally diverse forest system (TWRA 2014). Managing for a diversity of habitat types, even if the composition of associated vegetation changes, may still support desired conditions for valued fish and wildlife.

With many of Tennessee's highly diverse aquatic species already considered at-risk for a variety of reasons, the additional threat from climate change is likely to exacerbate conservation concerns (TWRA 2009). Indeed, it is the combination of climate change and other stressors such as polluted runoff and barriers to stream connectivity that will have the greatest impact on aquatic habitats and the species that depend on them (Sun et al. 2013). An integrated approach to managing aquatic species and habitats that takes into account multiple stressors, including climate change, will be important to help the state meet its short- and long-term wildlife conservation goals.



Fish kill associated with drought in September 2012 on the Chickasaw National Wildlife Refuge - USFWS

4.7.2. Spatial Vulnerability Assessment Maps

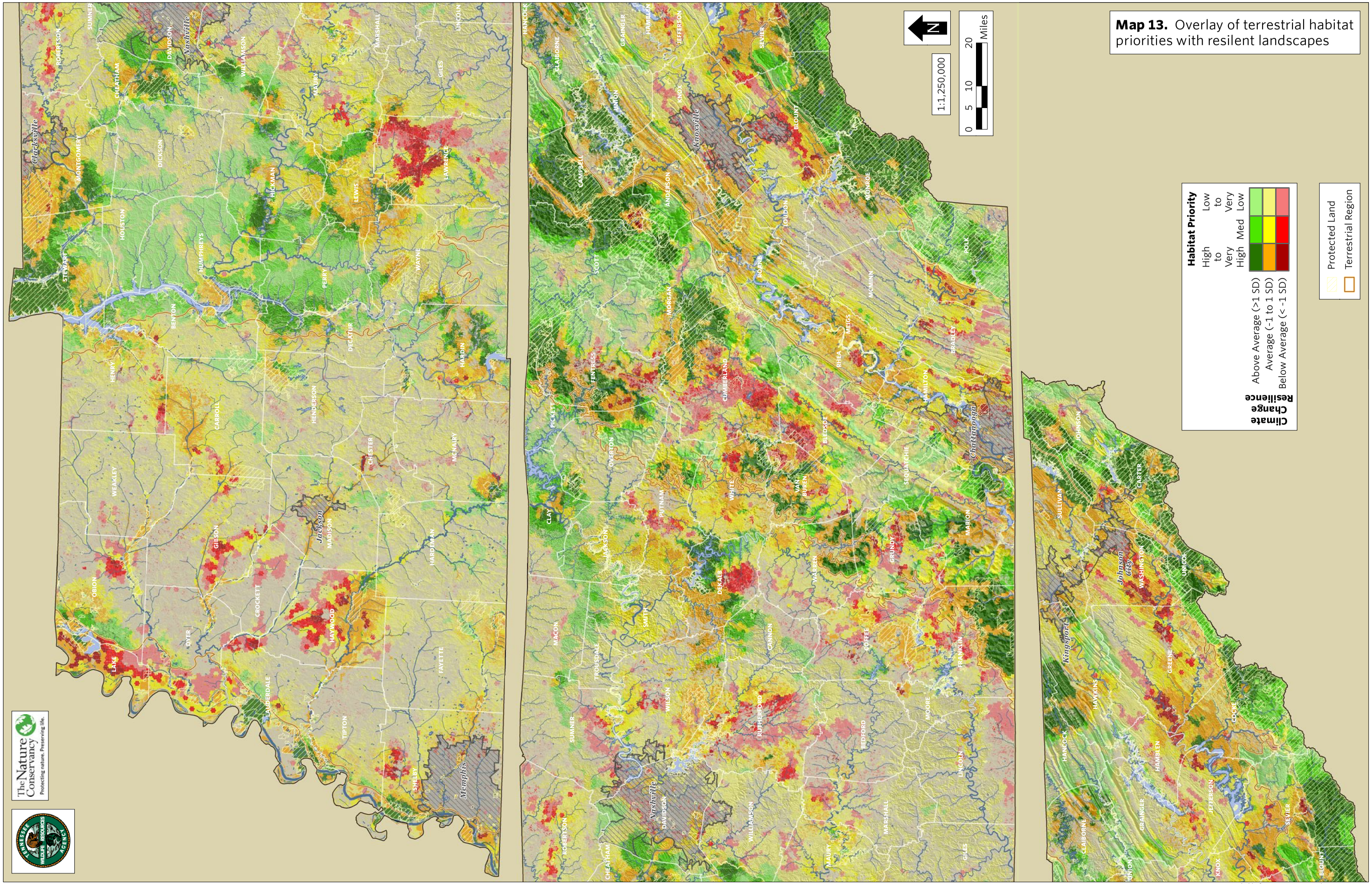
Tennessee's vulnerability assessment also includes a spatial analysis of climate change vulnerability across terrestrial habitats to help inform a landscape level understanding of potential issues across the state. The landscape vulnerability assessment draws from the approaches used by Joyce et al. (2008), Kershner and Mielbrecht (2012), and Anderson et al. (2014), with a focus on terrestrial habitat priorities updated by the 2015 SWAP (Glick et al. 2015). Several existing datasets and maps from these approaches are synthesized in the assessment, including:

- Terrestrial GCN Habitat Priority areas in Tennessee;
- Potential vegetation change using a Terrestrial Climate Stress Index; and
- Resilient Sites for Terrestrial Conservation in Tennessee.

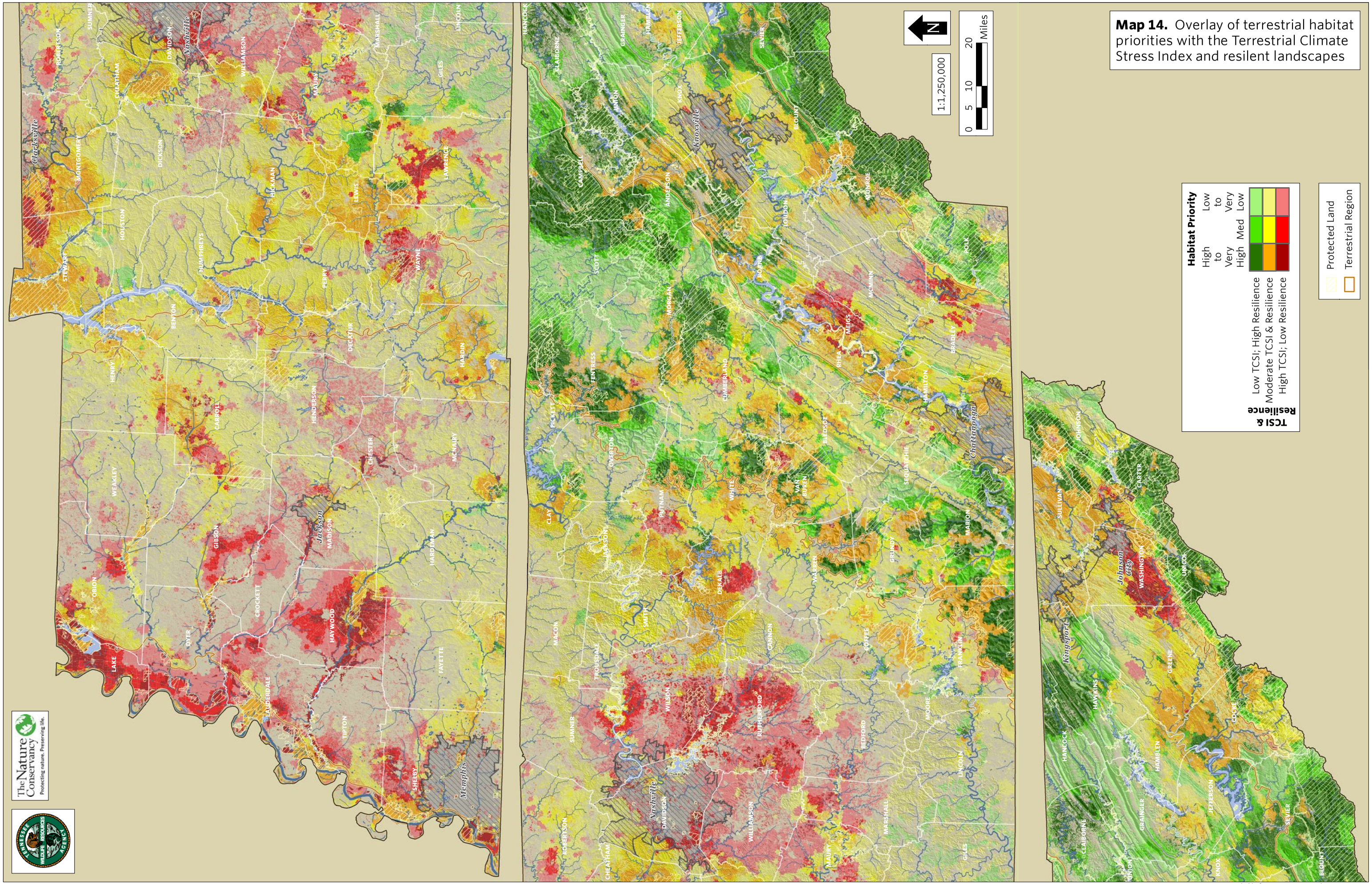
Two of the statewide vulnerability maps are provided below to illustrate the interplay between species, habitat, and resiliency in assessing climate vulnerability.

Map 13 shows an overlay of the landscape resilience to climate change scores and

Map 13. Overlay of terrestrial habitat priorities with resilent landscapes



Map 14. Overlay of terrestrial habitat priorities with the Terrestrial Climate Stress Index and resilient landscapes



the terrestrial habitat priority areas for Tennessee. Recall that both map inputs are stratified by ecoregion, meaning that sites within each ecoregion are compared only to other sites within the same ecoregion. Areas highlighted in darker green are high habitat priorities that coincide with relatively high landscape resiliency scores. Areas in yellow to light orange are high priority habitats within average locations of average landscape resiliency. Areas in darker red indicate places of high habitat priority but less than average resilience (i.e., higher potential climate change vulnerability). There are a number of areas across Tennessee that are identified as both high habitat priorities and resilient sites (the darkest green), which suggests that those particular resilient sites are likely to be important areas to maintain for biodiversity.

Map 14 combines information on the SWAP terrestrial habitat priorities with both landscape resilience and the terrestrial climate stress index (which incorporates potential vegetation change).

Examining these data collectively makes it possible to identify those places of high habitat importance for terrestrial GCN species in 2015 that are in locations of comparatively low landscape resilience and facing higher climate stress, indicating overall vegetation types within those areas also may be changing.

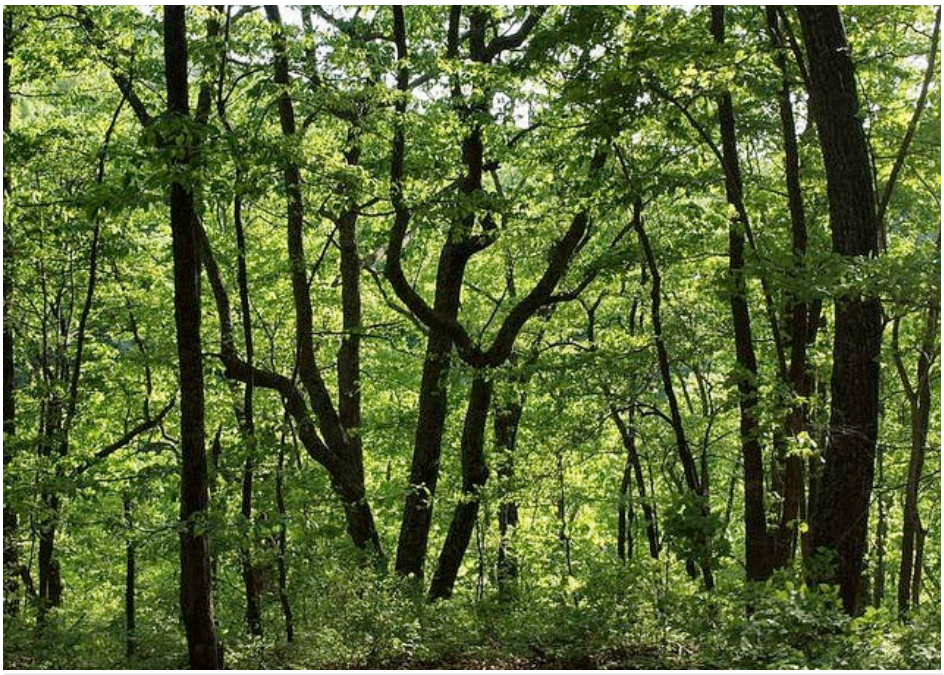


Mississippi Alluvial Plain habitats may be vulnerable to climate change. - Rob Colvin, TWRA

In Map 14, the darker green areas are current (2015) high priority habitats for terrestrial species and are also showing higher degrees of overall resilience to potential climate stressors including vegetation change. The darker red areas are also current (2015) high priority habitats, but those which are showing greater vulnerability to climate change due to lower landscape resilience and higher potential for major vegetation changes.

While there is a fair amount of complexity in results across the state depending on the various factors considered, current habitat priority areas in certain regions -- such as the Mississippi Alluvial Plain, Upper East Gulf Coastal Plain, and the Nashville Basin subregion of the Interior Low Plateau -- appear especially vulnerable to climate change compared to other areas, such as the Cumberland Plateau and Mountains and

portions of the Southern Blue Ridge (Map 14). Management strategies for these areas will need to take into consideration the potential for dominant vegetation type changes as well as the lower capacity of the surrounding landscapes to provide niche refugia or connectivity to other areas with natural vegetation cover.



Forest of the Cumberland Plateau: relatively intact natural vegetation cover is one characteristic of these forests, which appear promising as habitat refugia. - Hunter Desportes

Places that are identified as resilient and face relatively low terrestrial climate stress, such as the forests of the Cumberland and Smoky Mountains, appear especially promising as habitat refugia. These eastern Tennessee landscapes have more complex topography and geology, more intact natural vegetation cover, and are less likely to experience major vegetation type shifts. Other areas, including the Western Highland Rim forests of the Interior Low Plateau in middle Tennessee and some higher elevation sections of the Southern Blue Ridge, are identified as resilient from a landscape feature perspective, but face higher terrestrial climate-stress.

The Terrestrial Climate Stress Index (TCSI) rating identifies those areas more likely to undergo changes in terrestrial vegetation types. Also, the species CCVI results indicate that certain individual species may be vulnerable regardless of the potential for overall stability in their current surrounding landscapes. Therefore, management strategies for sites otherwise in resilient landscape settings will have to consider the potential trajectory of overall vegetation change as well as potential stresses on individual species of concern.

Climate change does not occur in a vacuum but rather acts synergistically with many other factors affecting Tennessee's GCN species. In some cases, climate change may not pose a major risk for a species, but that does not necessarily mean that the species is not otherwise imperiled. For example, a species assessed as Presumed Stable under the CCVI may still be impacted by other stressors unrelated to climate change, such as overharvest. Ultimately, managers will need to consider the broad context of conditions in which species and associated habitats exist, both now and in the future, in order to develop effective conservation strategies.



CHAPTER 5

CONSERVATION STRATEGIES AND ACTIONS

5.1. Defining Conservation Actions

THE 2015 SWAP PLANNING TEAM identified statewide conservation action priorities by reviewing the 2005 SWAP strategy hierarchy and the 2006-12 TWRA Nongame and Endangered Species Operational Plan (NGESOP), which was used by TWRA to begin implementation of the 2005 SWAP (TWRA 2006). The 2005 planning team used a standardized hierarchy to organize and define strategies, an approach now recognized as a Best Practice (AFWA 2012). The 2005 hierarchy was adapted from a format available at that time from the Conservation Measures Partnership and consisted of 2 broad categories, 6 major classes, 22 general actions and over 90 specific conservation actions. The Specific Conservation Actions were evaluated for their capacity to abate problems as determined through an expert-derived ranking process (see TWRA 2005, pp. 75-80).

The 2005 strategy ranking information, compiled in the SWAP database, allowed for a general determination of which Specific Actions could be most appropriate to abate problems for terrestrial, aquatic, and subterranean species (see TWRA 2005, pp. 147-178). This ranking system alone, however, did not allow for the identification of geographically specific strategies, as major problems were not mapped during the 2005 effort. The 2006-12 NGESOP took the summary information on strategies in the 2005 SWAP and applied it to identify projects and outcomes for TWRA to achieve across the different ecoregions of the state, organized by the agency's administrative regions. A majority of these projects were successfully implemented during the last

Pogue Wilderness, Cumberland Plateau - Byron Jorjorian

decade, and these experiences gave the 2015 planning team a foundation for understanding the relative applicability and success of various conservation actions in different places across the state.

The 2015 planning team determined that the 2005 strategy hierarchy, including all the General and Specific Actions, remains applicable to GCN statewide conservation efforts moving forward (Appendix G). The team chose to address General and Specific Actions that are most commonly implemented by TWRA in detail in the 2015 SWAP (see Table 15). Several other General Action categories -- particularly formal education and training, conservation finance, conservation enterprises, market forces, institutional improvements, and legislation -- can improve conditions for achieving conservation outcomes on the ground in meaningful ways. These types of enabling actions are successful most often in collaboration with a variety of partners and stakeholders, many times with these external partners in a leadership role. Therefore, the team determined that the specifics of when and how to execute these strategies is best addressed independently by partners or in collaboration with partners when appropriate. All SWAP partners and stakeholders

Summary: 2015 process for identifying and prioritizing conservation strategies and actions to benefit GCN species and habitats

1. Identify statewide conservation action priorities. Referring to the actions identified in both the 2005 SWAP and the 2006-2012 TWRA Nongame and Endangered Species Operational Plan, the SWAP planning team determined that the 2005 strategy hierarchy, including all the General and Specific Actions, remained applicable to GCN statewide conservation efforts.
2. Focus on a subset of the most important actions for addressing major problems identified in Chapter 4. In the 2015 SWAP, the team chose to elaborate in detail on 16 General Actions (in 5 Classes) that are most commonly implemented by TWRA and which address the major problems affecting species of Greatest Conservation Need and their habitats.
3. Define Conservation Opportunity Areas, a new approach in the 2015 update for focusing conservation efforts. The planning team considered three major attributes in designing COAs: GCN habitat priority, the problems affecting the habitats, and on-the-ground opportunities to implement conservation actions. The team stresses that COAs are not intended to artificially constrain decisions about what strategic actions are needed and where they apply.
4. Conduct vulnerability assessments and develop adaptation strategy approaches for GCN species and habitats in Tennessee. This is a new focus in the 2015 SWAP. The planning team identified which goals and strategies of the National Fish, Wildlife, and Plants Conservation Adaptation Strategy best align with TWRA's mission and expertise. The team worked with the National Wildlife Federation (NWF) to complete a "Climate-Smart" vulnerability assessment for Tennessee species and habitats and began the process of identifying the adaptation options for addressing key vulnerabilities.



TWRA's Watchable Wildlife website provides education tools and informas and promotes public engagement in wildlife conservation.

are encouraged to engage in these types of enabling strategies as best fits their organizational mission or individual expertise.

Table 15 provides a summary of the 16 General Actions (in 5 Classes) most commonly implemented by TWRA in a project leadership or funding role to achieve GCN species or habitat conservation outcomes since 2005. Under the General Actions listed in Table 15, the 2015 planning team also selected a total of 41 Specific Actions from the overall hierarchy as those most connected with TWRA's operational mission, capacity, and funding allocations for GCN management and assistance with federally-listed species recovery (Appendix H).

Table 15. Summary of conservation actions generally led and/or funded by TWRA in collaboration with partners to support GCN species and habitat conservation

Class	General Action
Habitat acquisition	Fee-title ownership Permanent protective easements
Information collection and dispersal	Communications and public relations Conservation planning Monitoring Research
Management and restoration of species and habitats	Compatible resource use Conservation area management Control/prevention of invasive exotic species and pathogens Habitat/Natural process restoration Species restoration
Capacity building	Alliances and partnerships
Law and policy	Compliance and enforcement Land use planning and zoning Policies and regulations Standards

The SWAP conservation actions, individually and collectively, will focus on addressing the major problems affecting species of conservation need and their habitats, as outlined in Chapter 4. These problems include addressing impacts from a wide variety of land and water uses; improving habitat quality and quantity; restoring species populations; and management to abate the negative effects of invasive species, pathogens, and climate change.

Successful conservation actions necessarily involve an emphasis on partnerships to achieve

- well-coordinated land and water management planning at a variety of spatial scales (i.e., regional, state, and local);
- effective environmental review and regulatory programs;
- expanded habitat acquisition and management;

- greater incentives for private landowner engagement in conservation;
- and education, research, and monitoring that fosters learning and improves our adaptive management capacity.

5.2. Conservation Opportunity Areas

Chapter 3 described the process for updating the SWAP terrestrial, aquatic, and subterranean habitat priorities. These habitat priorities are the most current geographic representation of the lands and waters across the state that are significant for protecting and restoring GCN species populations. Determining where and how to implement conservation actions involves many additional considerations including the problems affecting different places on the ground, the resources available to address the problems, and developing shared outcomes with conservation partners.

5.2.1. Designation Process for Conservation Opportunity Areas

For the 2015 update, the designation of "Conservation Opportunity Areas" (COAs) is a new approach to help focus the conservation efforts, not only of TWRA, but also of a wide range of other agency and nongovernmental partners. The identification of COAs is a recommended best practice for SWAP updates (AFWA 2012).

Unlike the standard lexicon for classifying problems and conservation actions, COA designations vary from state to state and do not follow a specific method. Each state designates COAs in a manner consistent with its data availability, planning process, and priorities.

"Spatially depict priority areas on the landscape that offer the best opportunities for GCN conservation and call them Conservation Opportunity Areas (COAs)." - AFWA Best Practices for SWAPs

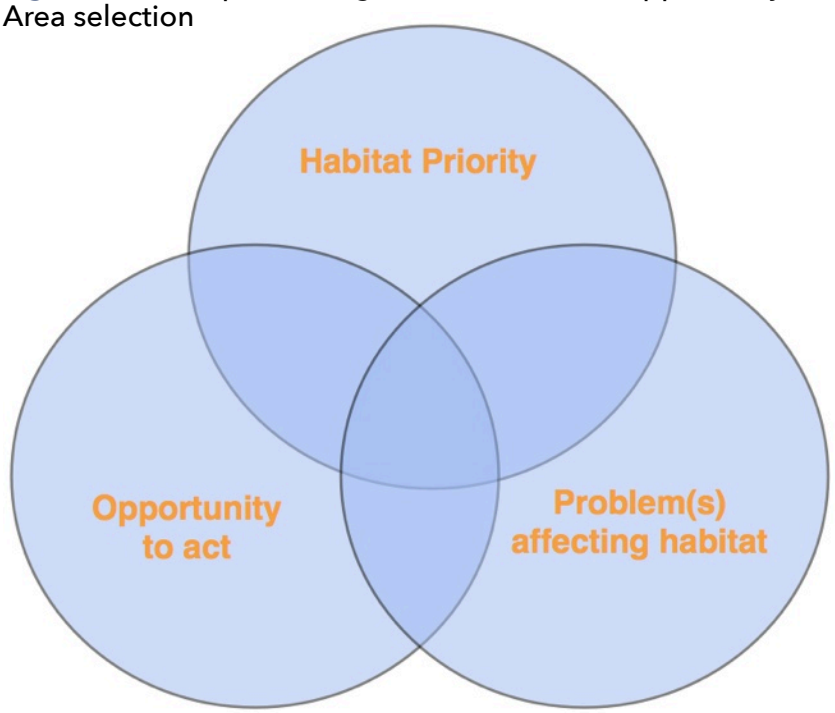


Reelfoot Lake in west Tennessee, internationally recognized for its wildlife diversity, scenery, and recreational opportunities, is a designated Conservation Opportunity Area. - Rob Colvin, TWRA

While designing the COAs for Tennessee, the planning team considered three major attributes: GCN habitat priority, the problems affecting the habitats, and the on-the-ground opportunities to implement conservation actions (Figure 9). The planning team used the GCN habitat priority maps (see Chapter 3, maps 5.1, 5.2 and 5.3) as the background data for identifying COAs. The boundary outlines of the COAs were then drawn to capture a geographic footprint where one or more conservation actions are needed to address a specific issue (e.g. agricultural best management practices, expanded conservation areas, urban stormwater management, or habitat restoration). The planning team also used expert knowledge on partnerships which are active and working in different areas to inform the boundaries, and capture the list of partners in each Conservation Opportunity Area Summary (see Appendix I).

Several regional and statewide conservation planning efforts have been completed by other agencies since 2005. Many of these agencies collaborated with TWRA and used the 2005 habitat priorities to help inform their designations of significant conservation areas. In designing the COAs, the 2015 SWAP team referenced the following documents:

Figure 9. Conceptual design of Conservation Opportunity Area selection



- Tennessee Heritage Conservation Trust Fund Act of 2005 analysis (TWRA, TDEC and TDA 2006);
- Tennessee Department of Environment and Conservation's **Tennessee 2020** plan (TDEC 2009);
- Tennessee Division of Forestry's **Tennessee Forest Resource Assessment & Strategy** (TDF 2010);
- **TWRA Strategic Plan 2014-2020** (TWRA 2014);
- West Tennessee Resources Conservation Plan (TWRA & USFWS 2004)

The COAs for Tennessee capture populations of GCN species and high quality habitats, and as appropriate, define the geographically relevant framework for achieving conservation outcomes. The COAs currently designed for Tennessee are large geographies, with the expectation that further prioritization and goal setting for specific habitat outcomes can be achieved within them through collaborations with partners on shared objectives. For those COAs containing GCN habitats for which major problems have been mapped (see Chapter 4), this spatial data can also be utilized at different scales to target appropriate conservation actions or interventions in collaboration with partners (see Table 15).

The COA boundary designations do not carry any new legal, regulatory, or jurisdictional authorities, nor do they place any restrictions on land uses or activities occurring within these areas. COAs are intended to foster partnership collaborations, investments and voluntary actions to conserve habitat within a given region of the state. This general approach to COA development is consistent with other states such as Illinois, Missouri, and Pennsylvania.

Another important consideration is that COAs are not intended to be fixed, limiting geographic boundaries. As more projects are designed and executed with partners, changes to the COA designations may be useful to better represent new information or the footprint of a particular project opportunity. In addition, achieving habitat conservation objectives will require adequate consideration of all terrestrial, aquatic, and subterranean priorities regardless of whether they are physically located within a COA boundary at this time. Finally, other wide-ranging collaborations on issues such as maintaining forest health can potentially benefit many different geographies and COAs at once.

Table 16 summarizes the Tennessee COAs within their respective ecoregions, and Map 15 shows the locations of COAs in reference to statewide habitat priorities, while Maps 16-19 show the locations of COAs in relation to public lands and major cities (dividing the state into four sections west to east).

Appendix I provides summary information in the form of a stand-alone factsheet for each Conservation Opportunity Area across the state. This information includes a description of the area, lists of species and habitats, general desired conservation outcomes and associated monitoring strategies, as well as ongoing or proposed conservation partnerships.



Hellbender conservation takes place both within and outside of COAs - Joshua A. Miller

5.2.2. Taking Action Outside of Conservation Opportunity Areas

The identification of Conservation Opportunity Areas helps define important geographies across the state where focused collaborations can improve outcomes for GCN species and habitats. However, not all populations of GCN species fall within COAs, and several types of significant conservation actions – such as land use planning, environmental reviews, and research – address issues that affect species and habitats across many different geographies.

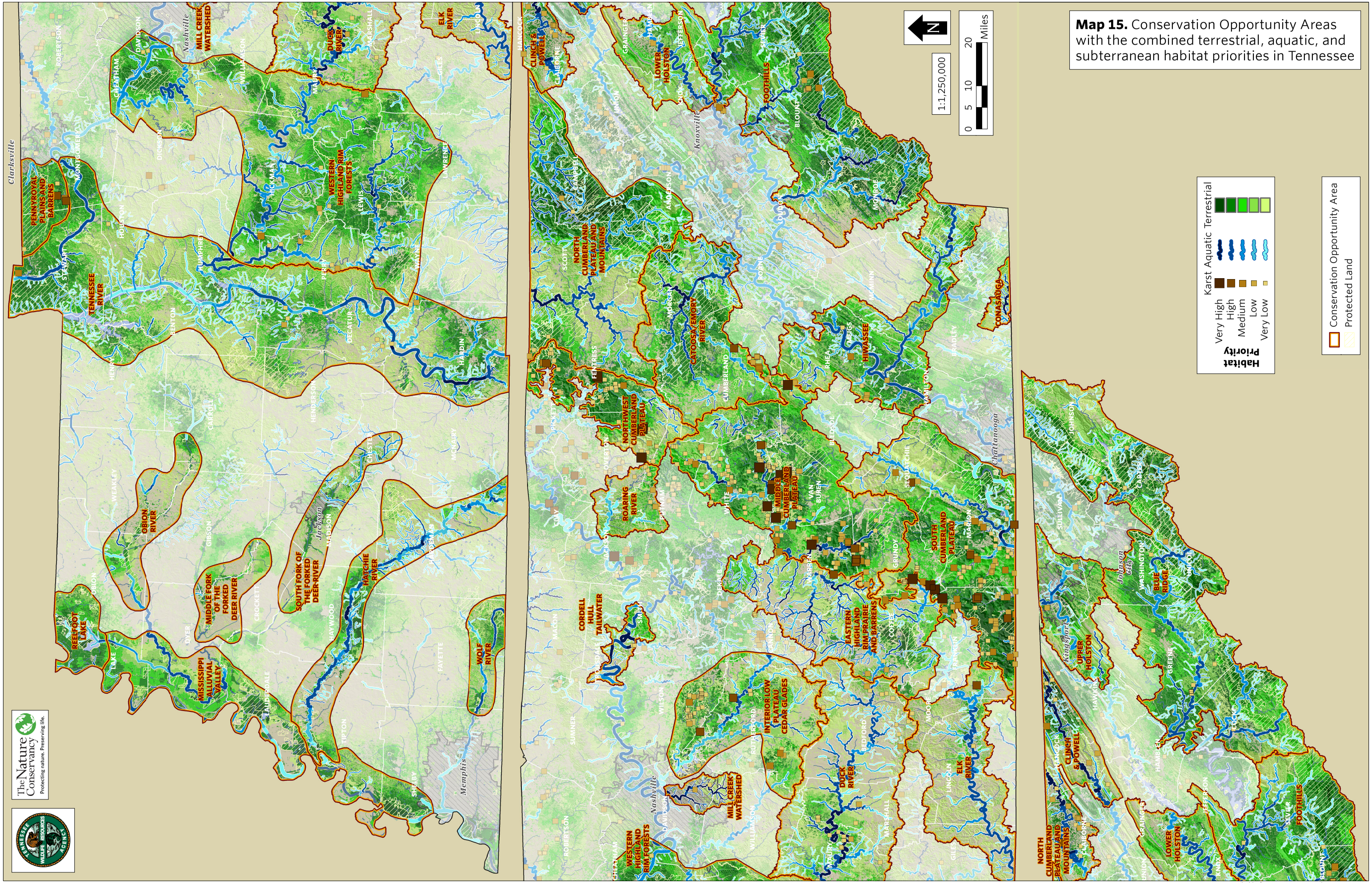
Other actions taken outside COA boundaries, such as stream barrier removals or using best practices for stormwater management, can show significant net benefits in both the local project area and for downstream aquatic habitats. Many of Tennessee's existing public lands contain one or more habitat types important

Table 16. Summary of Conservation Opportunity Areas and their location within terrestrial ecoregions and aquatic subregions

Conservation Opportunity Area	Terrestrial Ecoregion(s)	Aquatic Subregion(s)	Number of GCN species	Acres of very high, high, & medium ranked habitat (natural ecological systems only)	Stream miles of very high, high, and medium ranked habitat
Reelfoot Lake	Mississippi River Alluvial Plain	Mississippi	63	35,884	15
Mississippi Alluvial Valley	Mississippi River Alluvial Plain	Mississippi	77	132,323	117
Obion River	Upper Gulf Coastal Plain	Mississippi	51	33,696	20
Middle Fork of the Forked Deer River	Upper Gulf Coastal Plain	Mississippi	36	23,150	1
South Fork of the Forked Deer River	Upper Gulf Coastal Plain	Mississippi	45	36,352	45
Hatchie River	Upper Gulf Coastal Plain	Mississippi	77	105,444	267
Wolf River	Upper Gulf Coastal Plain	Mississippi	57	19,756	52
Tennessee River	Interior Low Plateau	Lower Tennessee, Lower Cumberland	191	573,176	421
Pennyroyal Plains and Barrens	Interior Low Plateau	Lower Cumberland	111	85,421	2
Western Highland Rim Forests	Interior Low Plateau	Lower Tennessee, Lower Cumberland	162	636,364	626
Mill Creek Watershed	Interior Low Plateau	Cumberland River-Nashville Basin	68	2128	87
Interior Low Plateau Cedar Glades	Interior Low Plateau	Cumberland River-Nashville Basin; Upper Cumberland River	152	116,874	59
Duck River	Interior Low Plateau	Tennessee River-Nashville Basin	148	61,922	278
Elk River	Interior Low Plateau	Tennessee River-Nashville Basin	115	28,552	167
Eastern Highland Rim Prairie and Barrens	Interior Low Plateau	Tennessee River-Nashville Basin; Upper Cumberland River	249	130,721	550
Cordell Hull Tailwater	Interior Low Plateau	Upper Cumberland River	62	22,674	60
Roaring River	Interior Low Plateau	Upper Cumberland River	102	39,154	1

Conservation Opportunity Area	Terrestrial Ecoregion(s)	Aquatic Subregion(s)	Number of GCN species	Acres of very high, high, & medium ranked habitat (natural ecological systems only)	Stream miles of very high, high, and medium ranked habitat
South Cumberland Plateau	Cumberland Plateau & Mountains	Tennessee River-Cumberland Plateau	308	473,060	104
Middle Cumberland Plateau	Cumberland Plateau & Mountains	Tennessee River-Cumberland Plateau; Upper Cumberland River	277	484,626	194
Northwest Cumberland Plateau	Cumberland Plateau & Mountains	Upper Cumberland River	161	204,339	28
Catoosa/Emory River	Cumberland Plateau & Mountains	Tennessee River-Cumberland Plateau	138	312,275	239
Hiwassee	Cumberland Plateau & Mountains, Ridge and Valley	Tennessee River-Blue Ridge; Tennessee River-Cumberland Plateau	172	215,602	237
Conasauga	Ridge & Valley, Southern Blue Ridge	Conasauga River	68	6,547	48
North Cumberland Plateau and Mountains	Cumberland Plateau & Mountains	Cumberland River-Cumberland Mountain; Upper Cumberland River	188	509, 412	445
Clinch and Powell	Ridge & Valley	Tennessee River-Ridge & Valley	138	116,652	211
Upper Holston	Ridge & Valley	Tennessee River-Ridge & Valley	73	81,893	83
Lower Holston	Ridge & Valley	Tennessee River-Ridge & Valley	69	56,682	79
Blue Ridge	Southern Blue Ridge; Ridge & Valley	Tennessee River-Blue Ridge; Tennessee River-Ridge & Valley	231	648,864	262
Foothills	Southern Blue Ridge; Ridge & Valley	Tennessee River-Blue Ridge	202	664,547	411

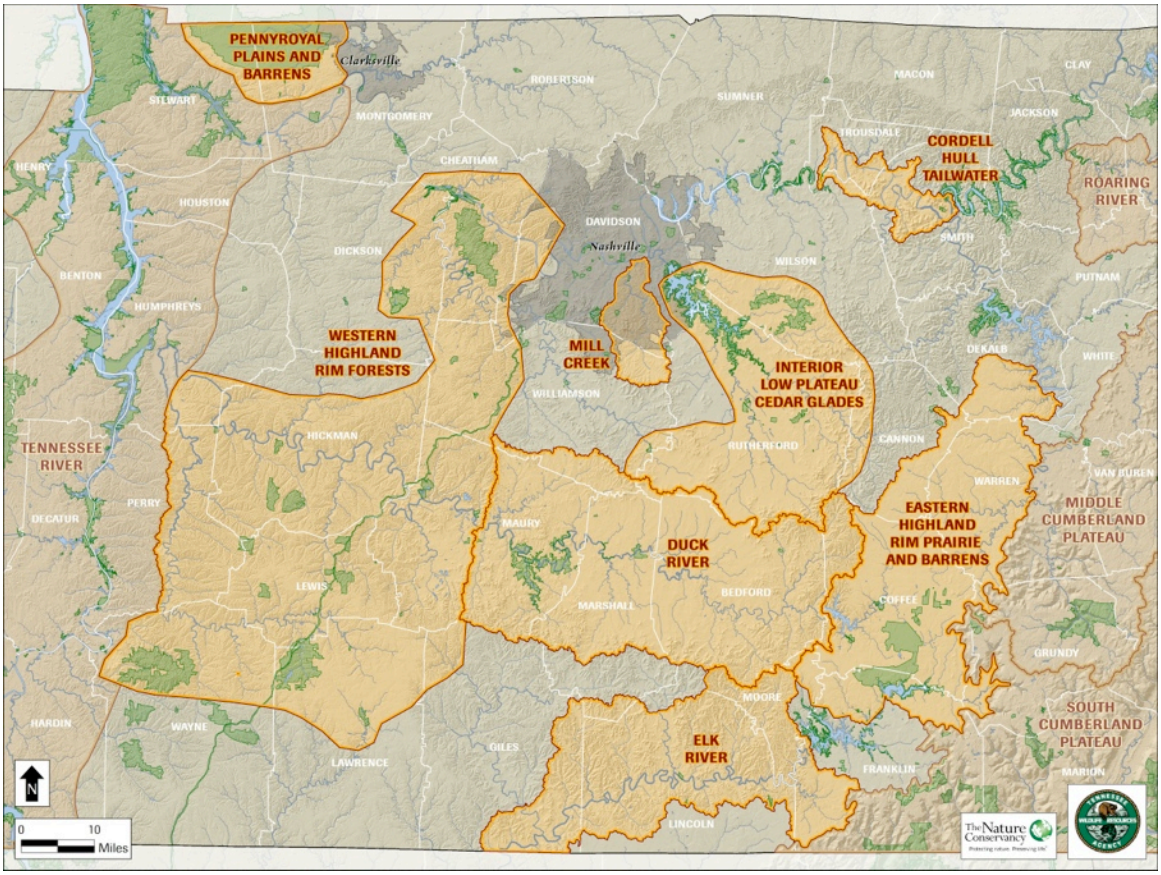
Map 15. Conservation Opportunity Areas with the combined terrestrial, aquatic, and subterranean habitat priorities in Tennessee



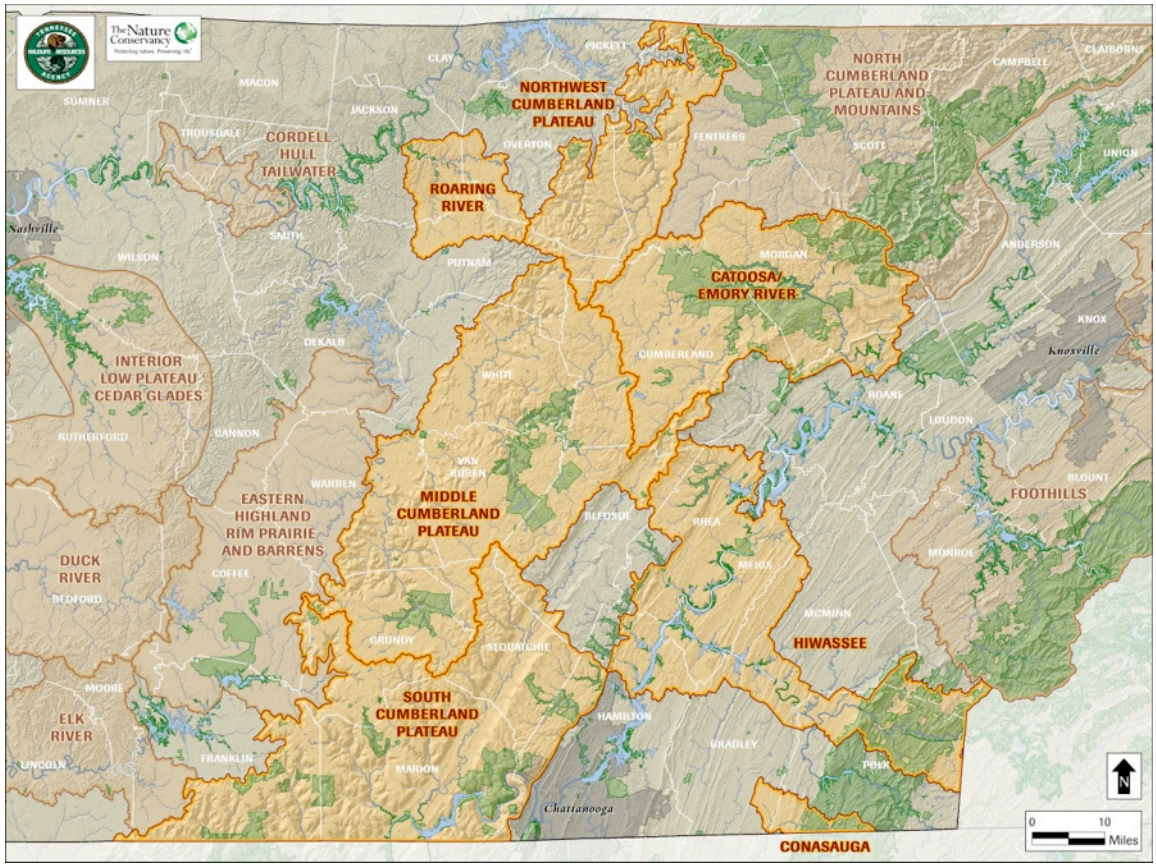
Map 16. West Tennessee COAs, Public Lands, and Major Cities



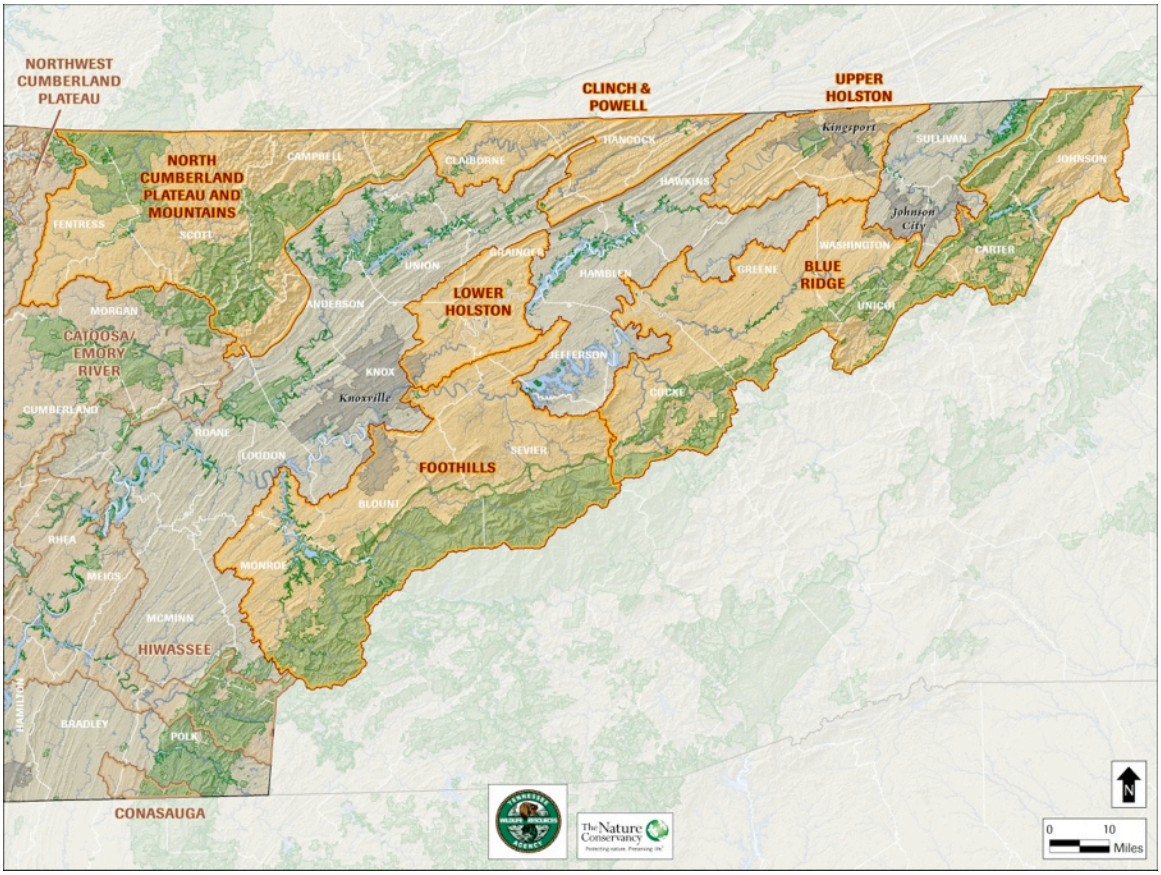
Map 17. Central Tennessee COAs, Public Lands, and Major Cities



Map 18. Cumberland Region COAs, Public Lands, and Major Cities



Map 19. East Tennessee COAs, Public Lands, and Major Cities



for GCN species, and while most public lands are captured within COAs, some are not. As the assessment of potential climate vulnerabilities demonstrates, vegetation types may change over time, resulting in habitat type and distribution shifts from what are identified as priorities on the landscape today.

COAs, therefore, are not intended to artificially constrain decisions about what strategic actions are needed and where they apply. The information on GCN species, habitats, and major problems in the SWAP GIS database can be used in a variety of different decision-making contexts to help determine where a project or strategy may be of benefit in any location across Tennessee.

Accordingly, the 2015 SWAP update articulates those conservation actions that are recommended to be employed statewide to benefit GCN species and their habitats, irrespective of COA boundaries. The overview of strategies in the following section highlights examples of general and specific conservation actions, organized by the SWAP hierarchy, which can be employed to address the major issues affecting species and habitats – whether within or outside COA boundaries.

COAs are not intended to artificially constrain decisions about what strategic actions are needed and where they apply.

These actions include efforts that could be best deployed at a statewide scale (e.g., policy or standards development) and others that must be tailored to habitat protection or restoration outcomes in specific locations (e.g., application of prescribed fire). The project examples demonstrate the importance of conservation activities for species and habitats both within and outside the current Conservation Opportunity Areas.

5.3. Overview of Priority Conservation Strategies in Tennessee

This section on priority conservation strategies is organized according to the Class level of the SWAP conservation strategy hierarchy (see Table 15 and Appendix H). The project examples are intended to illustrate the application of general and specific conservation actions both within and outside Conservation Opportunity Areas.

5.3.1. Habitat Acquisition

Habitat acquisition for conservation purposes continues to be a major need in Tennessee. Strategies for improving public and private funding for land acquisition statewide are important. A primary tenet guiding many, though not all, conservation acquisitions is to build upon and connect the existing public lands base. Conservation Opportunity Areas highlight geographies

where this type of focus may be successful. Another major tenet is to help private land owners and local governments who are already engaged in conservation to retain their land ownership and manage their resource values through education, technical assistance, or financial support.

In many cases where limited or highly dispersed priority habitats remain, or where land use threats are high, acquisition may be the primary and most effective strategy for preventing further habitat destruction and achieving conservation goals. The cedar glades and barrens of middle Tennessee are a prime example of acquisition helping to protect both rare and highly dispersed habitats. Two successful examples of how the 2005 SWAP helped to guide acquisition strategies for conservation are provided in this chapter.

Landscape-scale habitat conservation

In June 2007, the state of Tennessee and the Nature Conservancy, teaming with the timber companies Conservation Forestry and Lyme Timber, completed the largest land protection deal in Tennessee since the creation of Great Smoky Mountains National Park. A total of $82 million in state funding, $13 million from TNC – with financial assistance from the Doris Duke Charitable Foundation and the Tucker Foundation – and $40.2 million from the two timber companies was combined to protect 127,854 acres on the Cumberland Plateau.

This purchase connects the forestlands in Scott, Campbell, Anderson, and Morgan counties with 66,000 acres of existing public lands, creating a protective corridor for wildlife as well as preserving a natural sanctuary for the public. Ranked as globally significant for its diversity of plant and animal species, the area harbors increasingly rare species of bats, salamanders, fish, and other creatures. Migratory songbirds rely on the forestlands of this region for habitat in spring and summer, and large, wide-ranging mammals such as elk and black bear are sheltered on the Plateau.

A sophisticated mix of fee title, conservation easements, and timber rights were combined to close the deal, in which innovative working forest conservation easements, crafted by the



Sandy Gap, a part of the 127,854-acre Cumberland Plateau acquisition - David Engebretson

Tennessee Department of Environment and Conservation and The Nature Conservancy, keep 42,075 acres open to the public for recreation and guide sustainable forest management.

Conservation on this scale ensures that:
✦working forestland is protected, sustaining forest-based jobs and the industry around them well into the future;
✦current and future generations will continue to enjoy access to the property for recreation;
✦ forests are well-managed, remaining healthy and intact, which will help maintain water quality in local communities that depend upon these watersheds and deter floods and erosion;
✦rare ecological lands are added to state ownership and protected for future generations.

Conservation in Developing Areas

In areas of rapid urban/suburban development where land values are increasingly high, permanent conservation easements can provide an excellent alternative to fee title purchase. One such easement – purchased through private philanthropy in partnership with the Tennessee Parks and Greenways Foundation and $12,500 in federal funds through TWRA – occurred in 2013, permanently protecting 1,363 acres of mixed forest/grasslands on the Western Highland Rim in Williamson County.

Partnering with a landowner seeking to conserve property in the area, the easement conserves land near the headwaters of the Harpeth River, which is crucial to downstream habitat and aquatic biodiversity. It is also located adjacent to the Natchez Trace Parkway, with high connectivity to other protected lands. The SWAP GIS database model shows the habitat priority for this property is medium to high for terrestrial species. A survey of the property documented 22 species of reptiles and amphibians, including the Eastern Box Turtle. The tract also contains habitat for interior forest birds.

Conservation easement purchases such as this provide the following benefits:
✦Habitat for uncommon and rare species;
✦Public value in the form of scenic quality (in this case, viewable from the Natchez Trace Parkway);
✦High connectivity to other protected lands, which increases habitat functionality and security on a landscape scale;
✦Protection from encroaching suburban development.

5.3.2. Information Collection and Dispersal

The information collection and dispersal class of strategies includes the following types of General Conservation Actions: improved communications and public relations, conservation planning, monitoring, and research. Improved communications include a focus on raising awareness of stewardship issues on public lands, specific GCN conservation issues, and opportunities to partner in private lands conservation. TWRA also will

continue and seek to expand engagements in joint planning efforts with a variety of partners.

This approach includes the use of new conservation planning data in the 2015 SWAP GIS model to help identify and implement a variety of projects. The agency will also continue to invest in monitoring GCN species, habitats, and particular problems that threaten them. Such monitoring can often best be accomplished through investments and collaborations with researchers. Teaching and engaging the public and volunteers in monitoring activities, sometimes called citizen science, also is growing in popularity and can be helpful to achieving a variety of monitoring objectives. Wildlife diversity staff also will take advantage of new collaborations (e.g. with Landscape Conservation Cooperatives) to improve capabilities for both monitoring and planning at landscape and regional scales.

Communications & Public Relations

Partnerships among agencies and other organizations are effective means of increasing public awareness about important stewardship issues where knowledge can translate into conservation results. Good examples of this in Tennessee include the public outreach campaign to "**Buy Firewood Where You Burn It**" and the related **Don't Move Firewood** website designed to help stop the spread of invasive insect pests, as well as **Protect TN Forests**, which has a broader focus on promoting knowledge of practices that benefit forest health.

Monitoring and Research

Since the 2005 SWAP, TWRA wildlife diversity biologists have spent a significant amount of time monitoring GCN species populations and their response to management activities,



Clockwise from upper left: Electroshocking fish on East Fork of the Stones River - Pandy English; Banding a bat - Josh Campbell; Surveying Alligator Snapping Turtles - Rob Colvin; Live trapped woodrat on Kyles Ford WMA - Scott Dykes (photographers and those in photos all TWRA staff).

contributing to the improvements in the GIS and relational database noted in Chapter 3. Citizen science refers to research collaborations between interested citizens and researchers to collect data about the natural world. Citizen science monitoring programs represent an opportunity to expand the agency's capacity for monitoring certain GCN species. The following are current examples of TWRA citizen science, which could be expanded or replicated for different species:

✦The Tennessee Amphibian Monitoring Program, a partnership between TWRA and Middle Tennessee State University, is a good example of citizen science that recruits and trains volunteers to collect data about GCN species of frogs and toads.
✦Another program trains volunteers to recognize and monitor the spread of the destructive Hemlock Woolly Adelgid, an introduced insect pest that kills native hemlocks in east Tennessee's highlands.
✦A number of citizen groups currently monitor bat houses; greater coordination and sharing of Tennessee bat research between scientists and these programs could benefit both researchers and volunteers.

Monitoring on a very large, or landscape, scale requires continuously updating information in a fast-changing world. The U.S. Fish and Wildlife Service Landscape Conservation Cooperatives, which have been organized since the first 2005 SWAP planning effort, provide a major opportunity for states to engage and assist with planning and monitoring at large spatial scales.

By applying the expanded datasets in Tennessee's GIS relational database, TWRA can improve its species and habitat management decisions. For example, data on lowhead dams being compiled in partnership with the Division of Natural Areas and information on riparian zone condition will be useful to Environmental Services when reviewing permit applications submitted to the Tennessee Dept. of Environment and Conservation.

TWRA also supports research by or in collaboration with partners from academia and other institutions. For example, TWRA has worked with researchers from Middle Tennessee State University, University of Tennessee, and the Nashville Zoo to conduct research focused on improving Hellbenders' resistance to both Chytrid fungus and Ranavirus.



TWRA is supporting research on chytrid fungus and ranavirus in Hellbenders, both of which are thought to be associated with missing digits on the salamanders, as with the hind foot shown here, which normally has five toes. - Sherri Reinsch, Nashville Zoo

5.3.3. Management and Restoration of Species and Habitats

Management and restoration of species and habitats includes a number of General Conservation Actions that form the core stewardship practices designed to maintain ecosystem health: compatible resource use on public and private lands, conservation area management, exotic species/pathogen control, habitat and natural process restoration, and species restoration. This class of conservation strategies focuses on better direct resource management and planning on both public and private lands. Compatible resource use also can depend on effective environmental reviews which ensure that species and habitat needs are adequately considered and incorporated into land and water resource use decisions.

To achieve habitat improvements on public and private lands, it is necessary to make use of a variety of funding sources, especially state and federal incentive programs designed to assist landowners with practices that benefit habitat values as well as their own properties and operations.



Shelterwood cut with burning, an example of forestry management to benefit wildlife at North Cumberland WMA - Scott Dykes, TWRA

Habitat restoration can be thought of as two main types: (1) restoring natural processes, such as removal of barriers to restore stream flows or re-introduction of fire, and (2) restoring specific habitat types for species, such as forests, wetlands, and grasslands. Species restoration efforts become necessary in certain cases, such as with several fish and freshwater mussel species, when precipitous declines require direct population recovery strategies. In particular, restoration of habitats for federally-listed (Threatened or Endangered) species – as well as actions to address at-risk species that could result in precluding the need to list them under the ESA – can be supported through the USFWS Recovery and Partners for Fish & Wildlife programs.

Compatible Resource Use

The 2005 SWAP, the updated 2015 SWAP, and the Tennessee Division of Forestry's (TDF) 2010 **Forest Resource Assessment and Strategy** all agree that opportunities exist for collaboration among TWRA, TDF, and private landowners to improve forest management for the benefit of wildlife and plants. The following points, drawn directly from the Forest Assessment, summarize Best Management Practices (BMPs) needed to ensure

healthy forests for Tennessee wildlife and plants:

✦Forest stewardship plans that address forest health, intermediate stand practices, aesthetics, and non-native invasives will assist landowners in achieving multiple management goals, including wildlife conservation.
✦Structure essential to a diverse fauna can be provided by applying intermediate treatments, such as burning or thinning, and by regeneration harvesting in groups or patches.
✦Modification of some forest practices has been identified as an opportunity to aid certain GCN species. For example, habitat fragmentation and nest predation caused by large clearcut areas may be mitigated by using smaller, irregularly shaped, soft-edged interspersed clearcuts.
✦Habitat fragmentation can also be reduced when stand placement is considered in the context of the surrounding forests. Maintaining the connectivity of hardwood stands provides travel corridors for wildlife, and greater interspersion of food and cover resources.
✦Restoration and protection of uncommon forest habitats is also key to supporting many GCN animals and plants. Uncommon forest habitats include savannas, cave openings, wetlands, rock outcrops, bogs, springs, seeps, glades, balds, and vernal pools. Maintaining contiguous, mature forests across the landscape is also critical for conserving many GCN species, and these habitat needs are important to consider as forest management plans are designed.

Private land management is critical to achieving positive, long-term conservation outcomes in Tennessee. More than 90 percent of Tennessee's land is privately owned, and the manner in which private lands are managed significantly affects public environmental benefits, including water quality, habitat quality, the costs of wildlife management, and the long-term sustainability of wildlife populations. In fact, TDF has identified priority watersheds for focused management and outreach to private landowners based on the following:
✦watershed > 50% forested;
✦privately owned;
✦threatened by development;
✦supplies at least one public water intake.

Since 2007, TWRA has cost-shared four Private Lands Biologist positions with the Natural Resources Conservation Service (NRCS), a very important partner in private lands management. TWRA staff will continue to partner with NRCS in outreach to private landowners, the identification



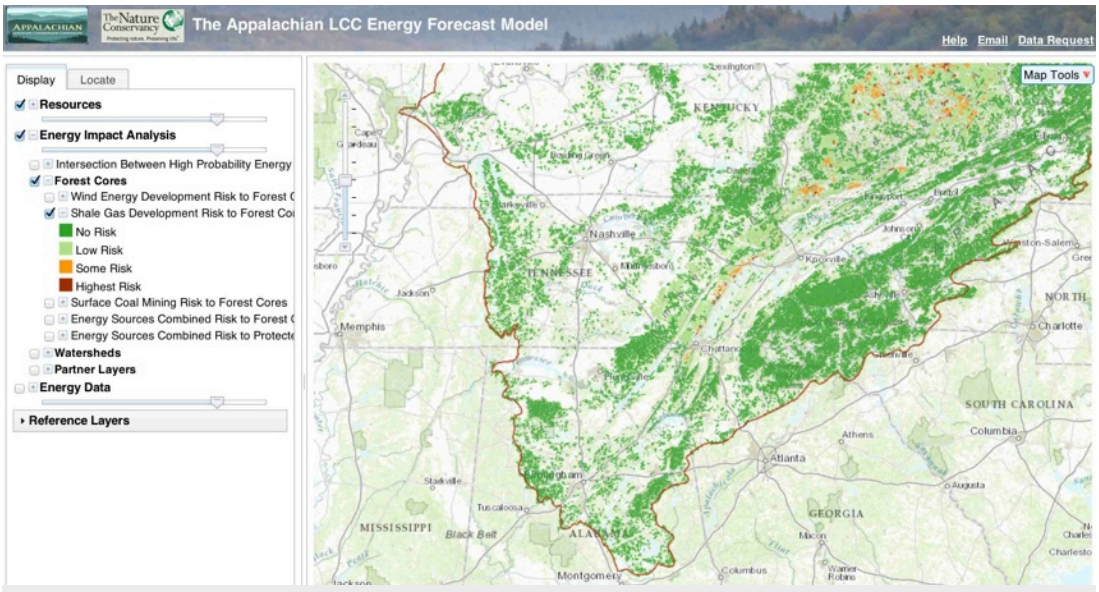
TWRA habitat biologist Wally Akins and a landowner discuss options for improving private property for wildlife. - Robin Mayberry, NRCS

of priority conservation practices for key areas of the state, and the prioritization of incentive program applications based on pressing wildlife conservation needs.

Advance planning and effective environmental reviews to mitigate problems and protect sensitive resources is an important strategy for both public and private lands. For example, the National Park Service developed the Big South Fork National River and Recreation Area/Obed Wild and Scenic River Final Non-federal Oil and Gas Management Plan/ Environmental Impact Statement in 2012. This strategy helps park managers ensure their park units are protected from current as well as potential future issues from new development. The plan provides park-specific guidance for oil and gas owners and operators who wish to establish new oil and gas extraction sites (NPS 2012).

Another example of advance planning at a regional scale is an analysis developed by The Nature Conservancy with support from the Appalachian LCC to assist policy makers, land management agencies, and industry leaders in assessing the overlap between potential future energy development and biological and ecological resource values. Data from the study is hosted on the web-based **Appalachian LCC Energy Forecast Model**, which allows users to query various datasets to see where energy development may likely occur and intersect with important natural values to inform regional landscape planning decisions.

Another important approach to ensuring compatible resource use is the advance designation of sites and areas for which particular land or resource utilization would not advance habitat and species conservation goals. An example of this type of determination has been conducted for the North Cumberland Wildlife Management Area (NCWMA) and lands in its vicinity in the Cumberland Plateau and Mountains region. The NCWMA offers one of Tennessee's premier opportunities to protect, manage, conserve, and restore GCN species and their habitats, with special emphases on aquatic, riparian zone, and ridgeline hydrological and ecological



The Appalachian LCC Energy Forecast Model, showing potential risk of shale gas development relative to forest cores in Tennessee and surrounding states.

function. Over 150 wildlife and plant GCN species are dependent upon adequate protection of these habitat features and their ecological function in the landscape.

TWRA has determined that new contour, cross-ridge, or mountain top removal coal mining is wholly incompatible with agency management and restoration for the NCWMA. Re-mining to resolve outstanding water quality and slope stability problems from previous mining and deep-mining, when properly done, are not considered incompatible with TWRA management plans for the NCWMA. For a detailed list of GCN species potentially affected by incompatible mining in the NCWMA and surrounding vicinity defined in a current State of Tennessee Lands Unsuitable for Mining petition, please see Appendix C, Table 5.

Conservation Area Management

TWRA Wildlife Diversity staff strive to work effectively with other TWRA divisions, the Tennessee Department of Agriculture's Forestry Division, and Tennessee Dept. of Environment and Conservation on management issues within Wildlife Management Areas (WMAs). This is a frequent goal of conservation area management in the 2015 SWAP. Collaboration between agencies with different expertise and jurisdictional authorities helps achieve balance between a variety of management objectives and will help improve habitat zones for all GCN species. For example many rare plants occur in rare and/or small patch habitats that also may include GCN wildlife species.

Another example of improving conservation area management comes from the Obed River Gorge, a popular rock climbing destination. Potential impacts to native plant communities and cultural resources from climbers led the National Park Service to develop the Obed Wild and Scenic River Climbing Management Plan (NPS 2002) to manage and decrease impacts. A similar example is the **Rock Climbing Guidelines** developed by the Tennessee Division of Forestry in cooperation with its user group, the Southeastern Climbers Coalition, to manage the impacts of climbing in Prentice Cooper State Forest.

Proactive management to prevent damage by licensed motorized off-highway vehicles (OHVs) and non-licensed All Terrain Vehicles (ATVs) often consists of driver education. TWRA provides **guidance to riders** on where these different vehicles are allowed and not allowed on Wildlife Management Areas. An excellent example of an educational initiative to improve rider safety and help prevent damage to creeks and rivers is provided by the **Iowa ATV Safety Course**.

Control/Prevention of Invasive Exotic Species and Pathogens

When exotic or introduced species threaten GCN species and habitats, a hierarchy of approaches to prevention and control is needed. Over the long-term, the most cost-effective, but also potentially the most labor intensive and difficult approach is to monitor for new outbreaks or invasions.

Often control or even eradication of invasive species is possible before they become well established. After an exotic species has become established, a variety of control mechanisms is available, depending on the species, but eradication is unlikely. Monitoring is appropriate to determine the level of threat and the effectiveness of management actions.

Arnold Air Force Base in Coffee and Franklin Counties is a good example of integrated pest plant management. The base's invasive pest management strives to:

✦support the maintenance of biodiversity;

✦maintain the structure and function of ecologically significant plant communities;

✦restore a functioning mosaic of barrens habitats;

✦protect high priority sites where plant invasions threaten rare species habitats; and

✦develop monitoring protocols to track management effects, and to detect new pest plant occurrences.



Basal bark treatment of an invasive woody species - Arnold Air Force Base



Joe Elkins, TWRA using an injector to apply herbicide to undesirable tree species in Shady Valley bog habitat. - Scott Dykes, TWRA

The Hemlock Woolly Adelgid, *Adelges tsugae*, is an insect that has wreaked havoc on many hemlock forests in the eastern United States. A relatively new biological control, the predatory beetle species called *Laricobius nigrinus* eats Hemlock Woolly Adelgid (HWA). **Experiments are ongoing in the Great Smoky Mountains National Park** and other Tennessee forests to release these beetles and slow down HWA infestations in priority conservation areas. This effort demonstrates the importance of research efforts in determining the best possible responses so that potential unintended consequences from the introduction of biological controls are understood and minimized.

Timely management actions tailored to address a new pathogen's spread are needed to combat emerging infectious diseases of wildlife. Pathogen spread in populations of one or more GCN species may require focused conservation or

research. The Eastern Hellbenders of Tennessee case study describes an example of this type of collaborative effort.

In recent years, TWRA has also seen evidence of the deleterious effects of pathogen infections on various reptile populations in middle and east Tennessee. Through participation in a multi-state State Wildlife Grant, TWRA has partnered with researchers from Cumberland University, Middle Tennessee State University, and University of Tennessee Department of Forestry, Wildlife and Fisheries Center for Wildlife Health to determine the presence of the snake fungal disease (*Ophidiomyces ophiodiicola*) in Timber Rattlesnake populations at Center Hill Lake, Cedars of Lebanon State Forest, and Flat Rock Cedar Glades and Barrens State Natural Area. Non-target species of reptiles are also sampled to determine if species other than rattlesnakes may be impacted.

Researchers have been performing telemetry to determine movement behavior and using special temperature-sensitive radio transmitters to record the body temperature of timber rattlesnakes throughout hibernation. These efforts, combined with observations of winter basking occurrences, allow researchers to gain valuable insights into the impacts of this devastating disease.

Habitat and Natural Process Restoration

Restoration of habitats and the natural processes that maintain their health is an important strategy for a large majority of GCN species. Within Conservation Opportunity Areas, restoration activities may be prioritized to improve or connect existing habitat areas. Important management techniques can include prescribed fire; removal of stream and river barriers; restoration and reconstruction of wetland and stream habitats; and reestablishment and management of native forest conditions. Map 20 provides an overview of where restoration from current semi-natural landcover conditions to the dominant forest type of the region can be most effective for expanding available habitat for GCN species (Wisby and Palmer 2015).

Prescribed fire is a management approach that provides measurable benefits to early successional and fire-adapted habitats in Tennessee, thereby benefiting many wildlife and plant species. TWRA will



Rattlesnake with snake fungal infection - Daniel Bryan, Cumberland University

TENNESSEE CASE STUDY: The Eastern Hellbenders of Tennessee - A species indicative of good water quality provides a focus for conservation statewide

Perhaps no other species in Tennessee is more emblematic of the widespread, interacting, and complex mix of threats posed by society to healthy aquatic systems than the Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis*). Picturesquely dubbed "The Last Dragons" in a 2014 film produced by Freshwaters Illustrated and the U.S. Forest Service, this giant salamander subspecies was once distributed throughout most streams in the eastern two-thirds of Tennessee.



With a fascinating life history – including a relatively long life (25 years or more), a fierce attachment to home territory, annual battles by males vying for mates, and males that guard their eggs and young – this species has become a flagship for what is extraordinary about Tennessee and southern Appalachian streams. Hellbenders have experienced precipitous population declines across much of the state in the past several decades, and their plight clearly illustrates an issue for which conservation efforts beyond the boundaries of Conservation Opportunity Areas must and will continue.



> "I did not know then (2001) that that individual would be the last Hellbender I would find in the Collins River." -- Dr. Brian Miller, herpetologist, Middle Tennessee State University

The Hellbenders' descent into rarity

Dr. Brian Miller, a salamander expert who first came to Middle Tennessee State University in 1989 to study Hellbenders, has been observing the species' decline for more than 20 years. He began working with Hellbenders in the Collins and Buffalo Rivers where populations seemed relatively high. After a survey hiatus from 1995 to 2001, he returned to the Collins River to find only one Hellbender. "I did not know then that that individual would be the last Hellbender I would find in the Collins River," says Miller.



Top to bottom: Hellbender in typical habitat at night, Hiwassee River -Dave Herasimtschuk, Freshwaters Illustrated; Small hellbender indicative of a reproducing population, lower Little River - TWRA staff; The Hiwassee River: some of the best remaining Hellbender habitat in Tennessee - LookoutBelle/next page: Hellbender in Tellico River - Dave Herasimtschuk, Freshwaters Illustrated

His assessment after searching numerous middle Tennessee rivers over subsequent years is that populations crashed over a 10-year span, going from low densities to almost non-existent. Miller notes, "In retrospect, I was probably working with an aged and dwindling population in the Collins River in the early 1990s, since I never found small Hellbenders back then."

This picture is complicated by one of the quintessential problems in ecology: a lack of historical information with which to compare current conditions. Miller estimates that the initial decline may have begun as early as the 1970s. However, the lack of data on the original size of Hellbender populations hinders any definitive assessment.

Unraveling Hellbender problems

Hellbenders require extremely good water quality. They need clear swift-flowing streams that keep crevices under streambed rocks open and available for Hellbender lairs. This species also breathes through its skin, making it dependent upon high levels of oxygen in the water. For these reasons, most stream modifications impact Hellbenders, including impoundments, channelization, siltation, acid mine drainage, and thermal pollution.



Increased levels of siltation from agriculture and other forms of runoff essentially bury Hellbender habitat. Silt may often carry with it herbicides and other chemicals, which some research has implicated as a potential contributor to Hellbender reproductive problems (Solis et al. 2007). Further complicating this picture is the fact that streams in Tennessee completely lack historical or current records on the chemical loads they carry. People who move or collect river stones for building often directly destroy Hellbender habitat. Finally, in the early 2000s there was also a question about whether Hellbenders were succumbing to diseases that have been spreading among amphibian populations on a global scale.

Responding to the unnerving decline that Miller had found in middle Tennessee's Hellbenders, in 2010 TWRA provided State Wildlife Grant (SWG) support to a collaborative group of researchers, including the University of Tennessee and the Nashville Zoo, to bring together salamander experts and develop a coordinated program of research aimed at improving Hellbender conservation. The program they developed aimed to achieve four goals:

1. Conduct field surveys of historic Hellbender locations to determine current distribution.
2. Determine the extent to which Hellbenders are susceptible to two widespread diseases affecting amphibians: chytrid fungus and ranavirus.
3. Develop an "e-DNA" (environmental DNA) protocol to allow sampling of Hellbender DNA from the water column to discern presence/absence and genetic differences among populations.

4. Develop techniques to study and boost wild Hellbender populations, including cryopreservation of sperm for captive breeding and development of crèche methods for rearing wild caught Hellbender young to increase their survival rate.

A complicated picture emerges

Research implemented by partners in this effort since 2010 has yielded the following:

- The Upper Tennessee Drainage has some of the best remaining Hellbender populations in the state, and the Middle Tennessee has remnant populations (the Duck and Buffalo watersheds), while the Cumberland Drainage populations are imperiled, with over 140 man hours of search effort yielding 0 Hellbenders. Moreover, moderate to high degrees of siltation were found in all the Cumberland waterways surveyed.
- Hellbenders can contract both chytrid fungus and ranavirus. In captivity, nearly all Hellbenders with ranavirus die when water temperature exceeds 68 degrees Fahrenheit (a common occurrence in streams during Tennessee summers).
- The Buffalo River in Middle Tennessee has a genetically unique strain of Hellbenders, which is different from those found in the Hiwassee and Ocoee Rivers of East Tennessee.
- Researchers successfully collected Hellbender sperm, using cryopreservation to "bank" their genes. Captive breeding of Hellbenders has been largely unsuccessful.
- Placing concrete Hellbender houses in streams has allowed fertilized eggs to be removed and hatched in captivity -- either for study or to improve survival of salamander larvae by growing them out for release back into the environment.

Bringing back Hellbenders: 2015 and beyond

People value rarity, and as Hellbender populations across the state have crashed, support and interest in their conservation has increased. Unfortunately, the level of effort required to assist rapidly declining wildlife populations is often quite high and quite complex.

The status of Hellbenders in Tennessee is inspiring concern and action: to understand where they are still found, what threatens them, and what conservation measures will be most effective.

TWRA and the U.S. Fish and Wildlife Service are supporting efforts aimed at further cataloguing Hellbender populations. In 2015, Dr. Miller at MTSU initiated (with TWRA SWG support) a population survey in the Little Buffalo River, the middle Tennessee stream with the best breeding densities of Hellbender according to a 2012 survey. Meanwhile, additional SWG funds are supporting researchers with the University of Tennessee Forestry, Wildlife, & Fisheries Department who are attempting to develop a means of inoculating Hellbenders against chytrid fungus to create disease-resistant populations in the wild.

The brightest part of the big picture is that steeper gradient rivers like the Hiwassee still have some of the best remaining Hellbender populations and could serve as potential sources for reintroduction efforts. However, if population crashes are associated with a decrease in water quality, then those issues must be remedied prior to any stocking efforts (see the Elk River case study). Dr. Miller sums it up by saying, "Some of these east Tennessee streams appear to have somewhat stable populations. Time will tell."

promote the application of prescribed fire in the COAs where fire suppression has occurred, on both public and private lands.

With support from the Tennessee Fire Council and the Tennessee Wildlife Federation, the Tennessee Prescribed Burning Act was signed into law May 10, 2012. This legislation provides liability protection for landowners who use prescribed fire appropriately, and it also authorizes the Tennessee Division of Forestry (TDF) to provide training programs to the public that teach basic fire ecology and the safe and appropriate use of prescribed fire.

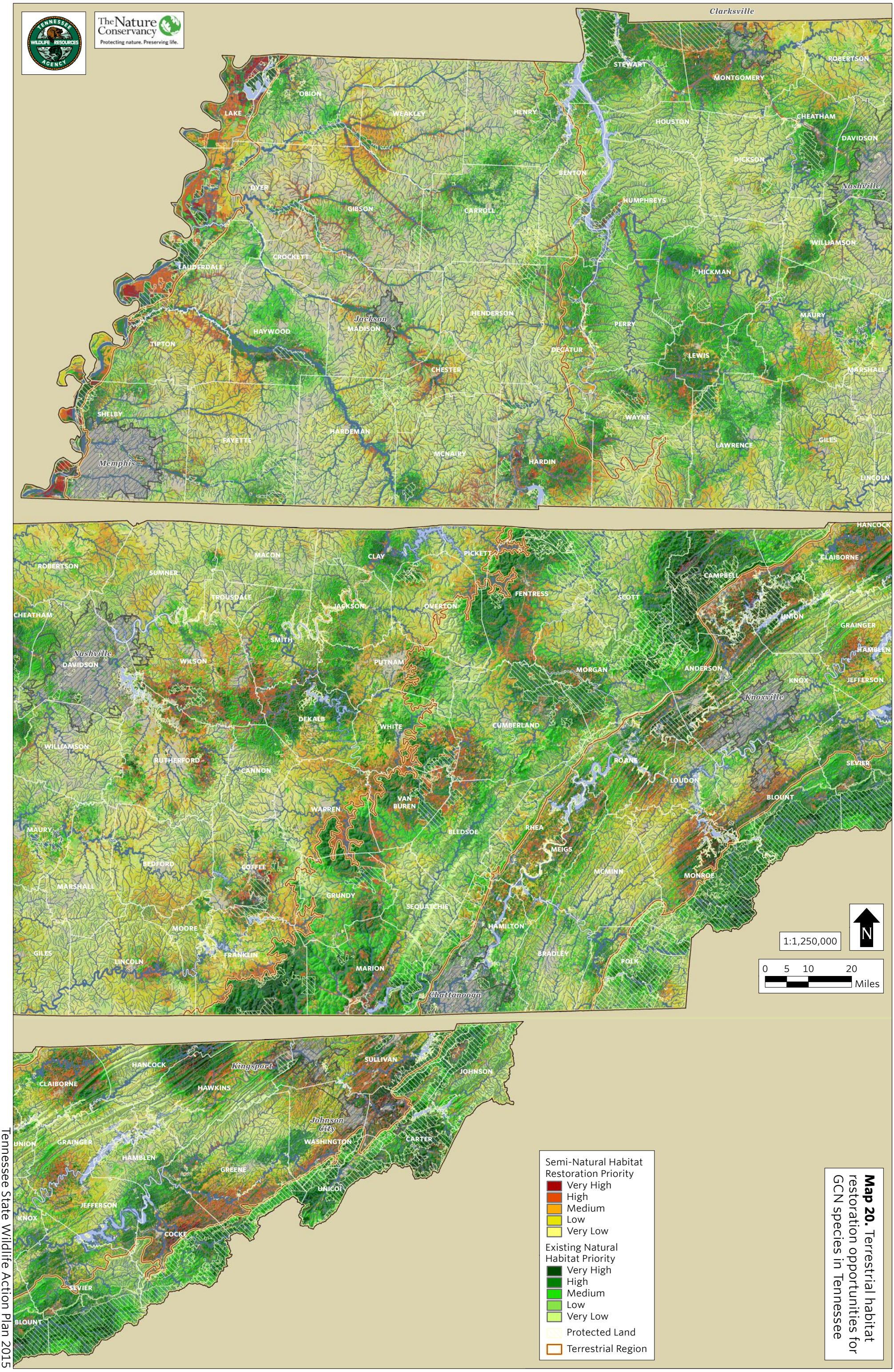
The Golden-winged Warbler Case Study demonstrates how early successional habitat management is emerging as a priority for wildlife management in Tennessee. These habitats are by definition constantly changing, as plant colonization and regrowth occur subsequent to a disturbance. Disturbance may be natural, such as lightning-ignited fire and storm damage, or it may occur as a result of human management, such as a prescribed fire or tree harvesting. Early successional habitats are important for a variety of GCN species, such as Prairie Warbler and Spotted Skunk.

As discussed in Chapter 4, managing large dam infrastructure and reservoir releases to improve water quality and habitat conditions for GCN species is critical for conservation efforts in Tennessee. Another type of activity gaining positive momentum is the restoration of stream habitat connectivity and stream flow through small dam removals. Many small dams on streams and rivers no longer serve the purpose for which they were originally built, and many pose public safety hazards.

Since 2012, several dam removals have taken place in Tennessee, with one in the pipeline as of mid-2015. In 2012, a multi-agency and organization coalition removed a lowhead dam on the Harpeth River near Franklin, TN. This project is located outside of any COAs



Above: Catoosa Wildlife Management Area 1 month after a prescribed burn; below: two native early successional species post-burn. - Clarence Coffey, TWRA retired



Map 20. Terrestrial habitat restoration opportunities for GCN species in Tennessee

TENNESSEE CASE STUDY: Intensive management for early successional habitat, guided by the needs of Golden-winged Warbler in the N. Cherokee Conservation Opportunity Area

The birdwatchers and fishermen who visit Hampton Creek Cove State Natural Area in the Southern Appalachians may not realize the degree of collaboration and management that goes into maintaining this ecological gem. Hampton Creek Cove (HCC) is a popular birding destination owned by the Tennessee Department of Environment and Conservation (TDEC) and managed by the Southern Appalachian Highlands Conservancy (SAHC) land trust.

The creek itself supports one of the most productive native trout streams in East Tennessee, while the old field/early forest succession at lower mountain elevation provides excellent nesting habitat for Golden-winged Warblers, a declining neotropical migrant species. The National Audubon Society designated HCC an "Important Bird Area" in 2005, even though it falls at the edge of the species' breeding range. The HCC site supports the highest density of Golden-winged Warblers on the Roan Mountain Massif.

> Due to their marked dependence on early successional habitat, if an area can be maintained for Golden-winged Warblers, it will likely remain suitable for many more species who rely on that habitat type.

Like many warblers, the Golden-winged is suffering a range-wide decline due at least in part to loss of breeding habitat (Schubert 2013). In fall 2007, the Tennessee Wildlife Resources Agency (TWRA) decided to work with TDEC at this 693-acre Natural Area to enhance habitat for Golden-winged Warblers. The scientific literature supports the idea that these warblers can be considered a type of "indicator" species. Because of their marked dependence on early successional habitat, if an area can be maintained as preferred habitat for Golden-winged Warblers, it will likely remain suitable for many more species that rely on that habitat type.

Hampton Creek Cove ranges from 3,000 to 4,800 feet at the higher elevations and is a mix of pasture, shrub-scrub, and mature timber. Golden-winged Warblers prefer scattered







Top to bottom: Forest habitat closing in without disturbance at HCC; Habitat opened up after bulldozing - both photos by Scott Dykes, TWRA; Golden-winged Warbler in the hand - Nora Schubert/next page left: Early successional habitat restoration begins; right: Green-up first spring after restoration - both photos by Scott Dykes, TWRA

shrub habitat with an understory of forbs (wildflowers and other broad-leaved herbaceous plants) and grasses, where they hide their nests. As scrub habitat matures, in the absence of disturbance from fire or storms, the canopy closes in, eventually making the habitat unsuitable for these birds.

In natural cycles, rebirth follows death; the process is no different for habitat restoration. Early successional habitat restoration involved work from 2007 through 2009 to open up 45 acres of forest canopy using heavy equipment, herbicide, and native grass seeding to ensure quick ground cover for the next breeding season. The seed mix included Fowl Bluegrass (found in four Tennessee counties), Little Bluestem and Indian Grass.

To document management at HCC and to assess the effectiveness of their project, TWRA also funded biological surveys of HCC Golden-winged habitat. Field work is documenting the warblers' population and breeding activities post-restoration, including characteristics of the vegetation in preferred nest sites. Ideally, nest monitoring will assess nesting success in restored and natural habitat.

The results of the habitat work speak for themselves. In years prior to restoration, between 16 and 17 Golden-winged Warbler breeding territories were documented. In the first year after restoration work began, territories dropped to 11, but this result was expected due to the large-scale disturbance of the site. By the spring of 2010, the first year without on-the-ground work, surveys showed 21 occupied territories! The 2013 survey showed that early successional habitat restored by TWRA was occupied by relatively high densities of Golden-winged Warblers, with 17 territories overall (Schubert 2013). Future habitat restoration at the site is recommended, including a monitoring design that will measure GWWA population response to habitat modifications.





The immediate result of conservation work to restore early successional habitat can look like the results of a very bad storm, and that is precisely the point. In Tennessee, vegetation regrowth is quick and profuse.

Schubert, N. 2013. 2013 Golden-winged Warbler monitoring at Hampton Creek Cove State Natural Area, Tennessee. Report submitted to Tennessee Wildlife Resources Agency.

designated in the 2015 SWAP, but would still be a priority today for its benefits to GCN species and local community values. In September 2014, the Tennessee Wildlife Resources Agency (TWRA) took down remnants of the Brown's Mill dam on the East Fork of the Stones River, funded in part by a State Wildlife Grant. Also in 2014 an outdated dam on Richland Creek at McCabe Park in Nashville was removed. All of these projects eliminated recreational hazards while improving and increasing habitat for a wide diversity of native fish and mussels.

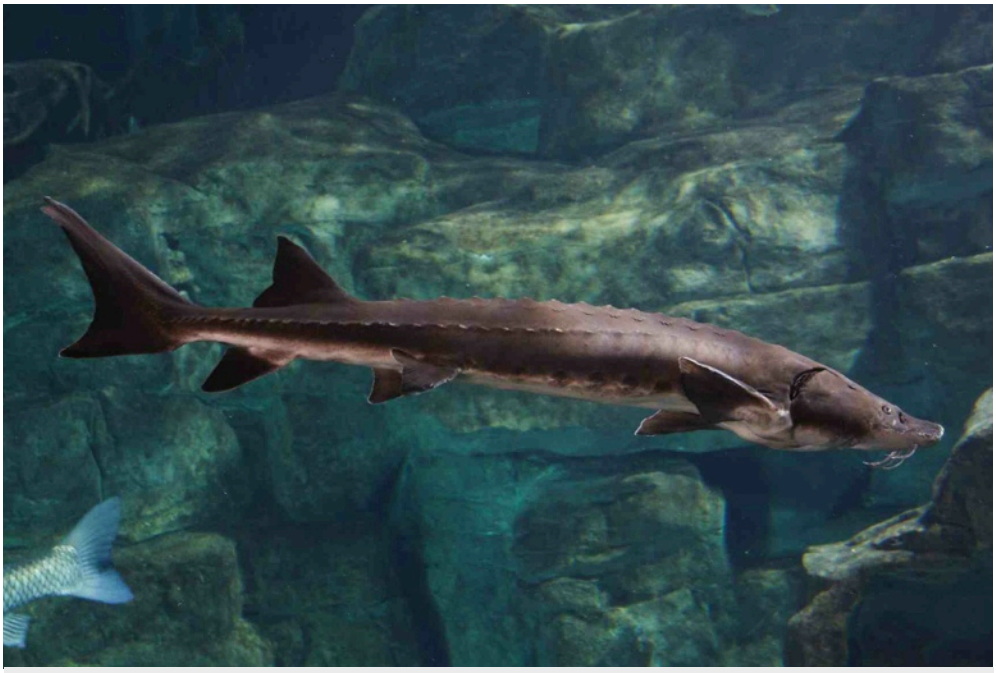
In collaboration with the Tennessee Dam Removal Partnership, TWRA has removed small dams and other river obstructions if they address the following criteria in a thorough planning effort designed to balance all resource values:

- The property owner is agreeable.
- Public safety can be improved.
- River ecology can be improved.
- Funding is available.
- There is support from the public, including but not limited to, local watershed associations and recreational users.
- The dam no longer serves its original or current purpose.

Species Restoration

TWRA and others have undertaken a number of species restoration projects in Tennessee to benefit animals and plants that are rare, declining, or locally extirpated (see Chapter 2). Species restorations occur primarily through one of two means: (1) propagation of plants/captive breeding and release of animals or (2) the transplanting of "seed stock" (both plants and animals). Restoration may occur to augment populations that are in trouble or to reintroduce species to sites where they have been extirpated. For example, a reintroduction and management program for Lake Sturgeon has restored this "fossil" species into several areas of both the Tennessee and Cumberland Rivers since 1998.

As with any complex program, many partners have played an essential role. In this case, the Tennessee Lake Sturgeon Reintroduction Working Group includes the U.S. Fish and Wildlife Service, TWRA, Tennessee Valley Authority, The Tennessee Aquarium, University of Tennessee,



Lake Sturgeon - Todd Stailey, Tennessee Aquarium

Tennessee Technological University, Tennessee Clean Water Network, World Wildlife Fund, and the U. S. Geological Survey (SLSWG 2014).

Lake Sturgeon are large, slow-growing fish that can live to be 150 years old. The cause of their decline was overfishing from the 1940s to 1961, when the last commercial catch took place. Since that time, the species has suffered from the effects of hydroelectric dams and water pollution. However, both the Clean Water Act (passed in 1972) and the Tennessee Valley Authority's Reservoir Release Improvement program contributed to improvements to habitat and prey species populations, making it feasible to consider reintroducing Lake Sturgeon.

Since 2000, more than 120,000 Lake Sturgeon juveniles have been released into both rivers. The program is considered a success by the following measures:

- all suitable habitat within management units is occupied;
- natural reproduction has been observed, with a level of recruitment sufficient to sustain the population;
- the population contains 20+ year classes of adults > 15 years old;
- some level of recreational harvest can be supported.

Although these outcomes have not yet been achieved, monitoring survey results and angler catches have indicated that Lake Sturgeon are persisting in Tennessee waters. These early successes indicate that the working group will be able to meet their long-term goal of Lake Sturgeon restoration.

5.3.4. Capacity Building

Capacity building is essential if governments and organizations are to meet the challenges faced by GCN species and habitats statewide. The problems, and often the solutions, are complex, requiring the intentional development of partnerships. Investments in designing and maintaining successful partnerships are significant conservation strategies that amplify the ability to deliver better on-the-ground outcomes in more places and for more species.

The **Tennessee Bat Working Group** (TNBWG) is an example of one such partnership. The group formed in the summer of 2004 to meet the need for cooperation in the coordination of bat conservation in Tennessee. The goal of the TNBWG is to conserve bats and their habitats in the southeastern United States through collaborative research, education, and management. The scope of the group's efforts is wide-ranging, including research, management, and information exchange concerning bats and their habitats anywhere they occur in the state, regardless of ownership. Members of the TNBWG have played a pivotal role in addressing



An adult Rafinesque's Big-eared Bat in the hand. - Scott Dykes, TWRA

White-nose Syndrome through its collaborative monitoring, research, and public education efforts.

The Tennessee Dam Removal Partnership is a diverse group of individuals from many organizations across several states. There are currently 39 participants representing city, state, and federal entities as well as nongovernmental organizations (NGOs). These include TWRA, TDEC, the Southeast Aquatic Resources Partnership, universities, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, environmental consultants, individual citizens and NGOs such as American Rivers, the Tennessee Clean Water Network, the Cumberland River Compact, and The Nature Conservancy.
The group has held two dam removal workshops facilitated by American Rivers and has supported directly or indirectly the removal of three dams since its creation. Members of the group are actively documenting and mapping obstructions that impact stream health as well as developing prioritization tools to help plan for Tennessee's dam removals in the future.

Like the Tennessee Bat Working Group, which has been invaluable in the fight against White-nose Syndrome, the Tennessee Dam Removal Partnership is organized and poised to deal with dam removal issues and opportunities that will no doubt present themselves in the near future.

Complex solutions to the challenges faced by GCN species often require the intentional development of partnerships.

The **Clinch-Powell Clean Rivers Initiative (CPCRI)** is a two state river coalition including government agencies, research scientists, conservation organizations, and industry leaders. This collaboration works to protect and restore water quality by executing and using high quality river monitoring and science in decision-making; educating key constituencies and raising public awareness; and investing in strategic conservation projects. Since 2007 the CPCRI has led a symposium and collaborative projects that have raised the national profile of these watersheds and elevated the significance of effective environmental management.



A dam under consideration for removal in 2015 - Chris Simpson, TWRA

A critical feature of capacity building efforts is the willingness to invest substantial funding in support of collaborative efforts. Funding from both the public and private sectors, and the sharing of dedicated staff resources whenever possible, are the primary mechanisms which support successful partnerships. State and federal funding resources are regularly matched by private donations and grant funds raised by NGOs, and other private sector actors.

Philanthropic foundations, individual businesses, and corporations often combine to make joint projects successful. Ongoing and future conservation are dependent upon effective relationships supported by intentional funding and commitment of staff.

5.3.5. Law and policy

Some of the problems that GCN species face are statewide in scope. The problems may be quite large, dispersed over vast areas, or accelerated by widespread economic needs and incentives. The major land and water use issues outlined in Chapter 4 – urbanization, agricultural land management, forestry practices, water management, energy development, and transportation and utility corridors – are contributors to these types of wide-ranging problems. Over-collection or illegal collection of several plant and animal species also can be a widespread problem in regions of the state. To address such challenges to GCN species and their habitats, the application of different federal, state, and local policies and regulations often is required. Much can be accomplished through advanced engagement, the identification of shared interests, and cooperative planning. Using these strategies, a variety of objectives may be achieved, including conservation of species and their habitats.

Land Use Planning and Zoning

By promoting and sharing information in the 2015 SWAP with local planning agencies, municipalities, nongovernmental organizations, and many other partners, TWRA will amplify the ability of those groups to effectively plan for the conservation of their community's natural wealth, which underpins quality of life. Information in the 2015 SWAP about priority GCN habitats, Conservation Opportunity Areas, and GCN species can improve planning and provide additional rationale for long-term comprehensive approaches designed to avoid urban sprawl.

Policies and Regulations

Information on GCN species and their priority habitats also can help better inform a variety of existing environmental policies. Similar to the specific partnerships discussed previously as Capacity Building examples, ensuring effective environmental policy and regulatory implementation requires a focus on active collaboration with both public and private sector partners. Protecting GCN species and habitats, in the context of many land and water resource use decisions, requires cooperation and commitment to incorporating available information on species and habitat needs during the process. Several of these types of strategic collaborations are outlined in more detail in Appendix G.

The application of compensatory mitigation approaches at different spatial scales is one area in particular where a variety of expertise and information can be utilized to achieve better outcomes. One example is the application of a "watershed approach" to

compensatory mitigation under the 2008 rule issued under the Clean Water Act by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (EPA) (see Case Study: Stones River Species of Greatest Conservation Need). The rule emphasizes the need to consider habitats of important species and the long-term sustainability of aquatic resources and their associated uplands.

Compliance and Enforcement

Regulations that limit or prohibit the take of wild animals or plants are written to protect the health of species populations. TWRA law enforcement officers investigate and apprehend violators for wildlife offenses ranging from the illegal sale of certain crayfish species as live bait to the illegal take and commercialization of Common Snapping Turtles. Without enforcement, such illegal activities would continue unabated and possibly increase.



Great Egret, a GCN species dependent on wetlands. - Cynthia Routledge

5.3.6. Develop Climate Adaptation Strategies

Preparing for and coping with current and future climate impacts is an emerging field known as climate change adaptation.

In 2012 a consortium of federal and state agency and tribal leaders released the National Fish, Wildlife, and Plants Climate Adaptation Strategy (NFWPCAS). The national strategy provides a framework of goals and strategies "designed to inspire and enable natural resource managers, elected officials, and other decision makers to take action over the next five to ten years to help our living resources adapt to climate change" (NFWPCAP 2012). The strategy is a complementary effort to a wide variety of ongoing science and conservation efforts across the country.

The NFWPCAS identifies the following seven over-arching national goals:

Goal 1: Conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate.

Goal 2: Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate.

Goal 3: Enhance capacity for effective management in a changing climate.

Goal 4: Support adaptive management in a changing climate through integrated observation and monitoring and use of decision support tools.

Goal 5: Increase knowledge and information on impacts and responses of fish, wildlife, and plants to a changing climate.

Goal 6: Increase awareness and motivate action to safeguard fish, wildlife, and plants in a changing climate.

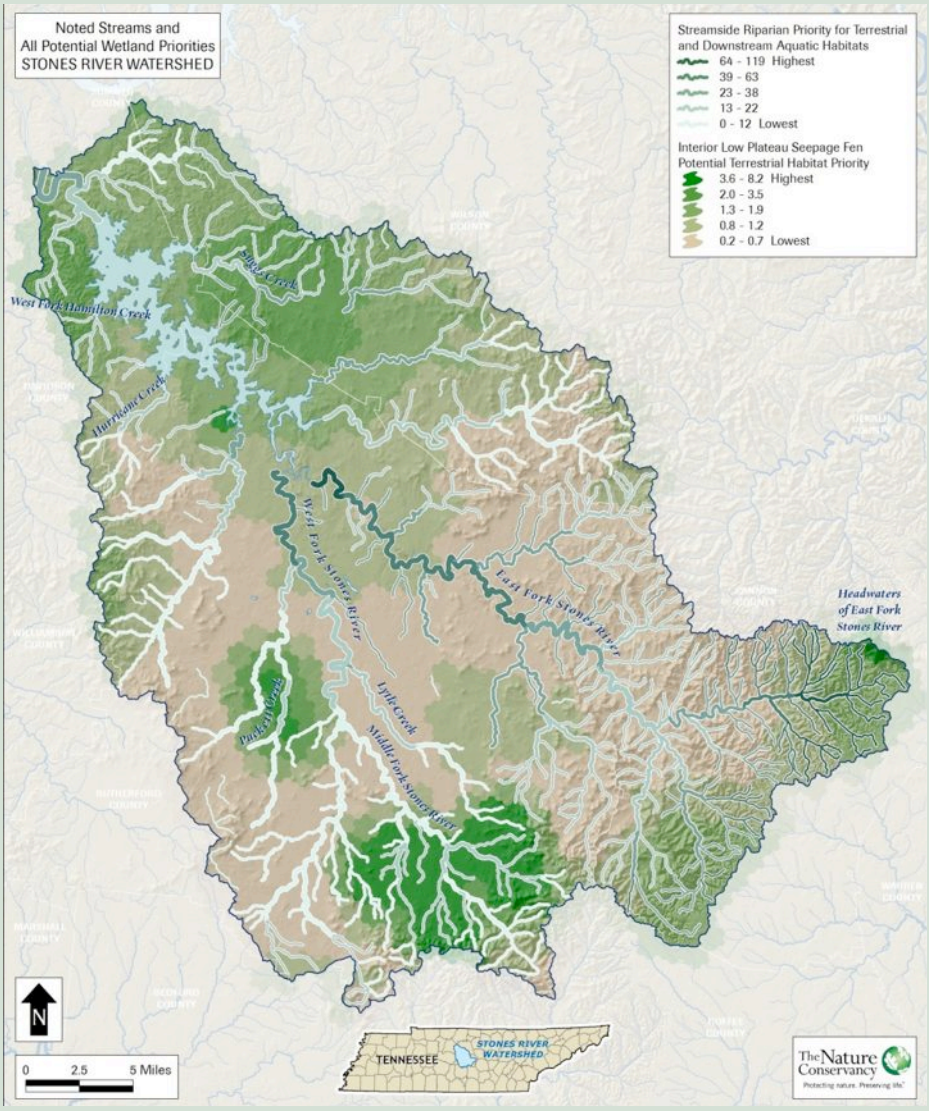
Goal 7: Reduce non-climate stressors to help fish, wildlife, plants, and ecosystems adapt to a changing climate.

TENNESSEE CASE STUDY: Stones River Species of Greatest Conservation Need and their habitats inform the application of compensatory mitigation for wetlands and streams

From 2009-2011, The Nature Conservancy and the Environmental Law Institute, with support from the Doris Duke Charitable Foundation, worked with the U.S. Army Corps of Engineers, TDEC, EPA, TWRA, and other partners to demonstrate how data on GCN species and their habitats could be utilized as part of the watershed approach framework for wetland and stream mitigation decisions in Tennessee (**Palmer and Wisby 2011**).

The Stones River Watershed map shows the distribution of important stream habitats and potential wetland areas based on known GCN distributions and wetland habitat preferences. The results of this pilot effort demonstrate that proper application of the compensatory mitigation hierarchy within a watershed context can help achieve habitat conservation as well as promote the restoration and protection of other important resource values (Palmer and Wisby 2011). Using the information in the SWAP GIS database, similar watershed maps can now be produced for watersheds across Tennessee, at the preferred spatial scale of the planning effort.

> Application of this compensatory mitigation hierarchy within a watershed context can help achieve habitat conservation as well as promote the restoration and protection of other important resource values.



The Stones River is a significant watershed in Tennessee's history. It contains large expanses of prime farmland; provides drinking water for over 250,000 people and annual recreational opportunities for millions; and provides important habitats for globally rare plant and animal species. Land development patterns and future trends suggest that resource impacts requiring mitigation in the watershed are likely to continue.

The data and methods developed for the Stones River plan mark a major advancement in the application of conservation data to stream and wetland mitigation decision-making in Tennessee. Previously, conservation data was available to decision-makers either as individual species locations or habitat patches, neither of which was related to known wetland occurrences in the National Wetland Inventory. The Nature Conservancy used a variety of different datasets to make these connections more explicit, and to improve our collective understanding of the significance and spatial distribution of plant and animal species habitats throughout the watershed.

The final report provides specific recommendations on how mitigation siting and techniques can be applied to achieve multiple resource benefits. These benefits include the following:

- Improving stream health currently degraded from excess sediment;
- Protecting and restoring species habitat;
- Connecting existing conservation lands in the watershed; and
- Maintaining and improving recreational, historic, and agricultural resources.

With respect to GCN species conservation, the Stones River watershed plan identifies several opportunities to avoid negative impacts and utilize restoration and preservation techniques to improve habitat conditions. These include the following:

- Floodplain sections of the East and West Forks of the Stones River provide significant habitat for rare plant and terrestrial animal species.
- The East Fork of the Stones contains the majority of remaining populations of fish, mussel, and crayfish native to the watershed.
- The upper headwaters of the East Fork provide extremely significant habitat for the Brawley's crayfish, a globally rare and State listed Endangered species.
- Isolated wetland habitats in the Puckett Creek subwatershed occupied by the Streamside Salamander, a State rare species, may be impacted by projected land conversion.
- The limestone glade habitats, including seep zones, are highly significant for many globally rare endemic plant species.

Applying this conservation framework to mitigation decisions in the future may make significant contributions to the long-term sustainability of aquatic resources in the Stones River watershed and the associated benefits they provide.





The data and methods developed for the Stones River plan mark a major advancement in the application of conservation data to stream and wetland mitigation decision-making in Tennessee.



Top to bottom: Gray Bats - USFWS; Louisiana Waterthrush - Andy Reago & Chrissy McClarren; Stones River - Casey Fleser

The strategy calls upon government agencies and non-government partners to incorporate goals, strategies, and actions as appropriate into ongoing planning efforts, particularly State Wildlife Action Plans (NFWPCAP 2012).

As described in Chapter 4, TWRA and TNC worked with the National Wildlife Federation (NWF) to complete an updated vulnerability assessment for species and habitats in Tennessee and begin the process of identifying potential adaptation strategies (Glick et al. 2015). NWF is a national leader in connecting climate science and adaptation principles with on-the-ground management actions. The 2014 publication **Climate-Smart Conservation: Putting Adaptation Principles into Practice**, outlines a planning process that guides the development of many types of conservation actions to address climate change-related management concerns and provides case studies of strategy development and implementation (Stein et al. 2014).



Ephemeral wetlands at Hickory Flats WMA - Josh Campbell, TWRA

For the 2015 SWAP revision, the planning team focused on identifying which NFWPCAS goals and strategies best aligned with TWRA's mission and expertise, the key vulnerabilities facing Tennessee's native species and habitats, and what types of adaptation options might be most applicable for addressing key vulnerabilities.

While TWRA and its conservation partners have a role in achieving all seven national goals, three goals and their accompanying strategies were identified as particularly appropriate and connected to important conservation needs in Tennessee (Table 17).

Focus on key vulnerabilities and general adaptation actions

Effectively designing adaptation actions requires an emphasis on "key vulnerabilities," including an understanding or working hypothesis of the reasons a species or habitat is vulnerable (Stein et al. 2014). The companion report to this 2015 SWAP revision (Glick et al. 2015) provides a discussion of the key vulnerabilities facing Tennessee's species and habitats, which also are summarized in Table 18. The 2015 planning team also took the NWF General Adaptation Strategy system and aligned it with the three main NFWPCAS national

goals chosen as a method of "stepping down" elements of the national strategy into more specific adaptation options (see Table 19).

Identifying preliminary adaption options

Many of the conservation strategies and management actions previously discussed in this chapter are highly relevant for addressing climate change vulnerabilities. However, applying these actions as climate adaptation options requires considering their effectiveness given the potential impacts of climate change at local and landscape scales and in the context of other problems

Table 17. NFWPCAS goals and strategies emphasized in Tennessee's SWAP

Goal	Strategy
Goal 1: Conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate.	***Strategy 1.1:*** Identify areas for an ecologically-connected network of terrestrial, freshwater, coastal, and marine conservation areas that are likely to be resilient to climate change and to support a broad range of fish, wildlife, and plants under changed conditions.
	Strategy 1.2: Secure appropriate conservation status on areas identified in Action 1.1.1 to complete an ecologically connected network of public and private conservation areas that will be resilient to climate change and support a broad range of species under changed conditions.
	***Strategy 1.3*:** Restore habitat features where necessary and practicable to maintain ecosystem function and resiliency to climate change.
	Strategy 1.4: Conserve, restore, and as appropriate and practicable, establish new ecological connections among conservation areas to facilitate fish, wildlife, and plant migration, range shifts, and other transitions caused by climate change.
Goal 2: Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate.	***Strategy 2.1:*** Update current or develop new species, habitat, and land and water management plans, programs and practices to consider climate change and support adaptation.
	Strategy 2.2: Develop and apply species-specific management approaches to address critical climate change impacts where necessary.
	Strategy 2.3: Conserve genetic diversity by protecting diverse populations and genetic material across the full range of species occurrences.
Goal 7: Reduce non-climate stressors to help fish, wildlife, plants, and ecosystems adapt to a changing climate.	***Strategy 7.1:*** Slow and reverse habitat loss and fragmentation.
	Strategy 7.2: Slow, mitigate, and reverse where feasible ecosystem degradation from anthropogenic sources through land/ocean- use planning, water resource planning, pollution abatement, and the implementation of best management practices.
	Strategy 7.3: Use, evaluate, and as necessary, improve existing programs to prevent, control, & eradicate invasive species and manage pathogens.
	Strategy 7.4: Reduce destructive capture practices, over-harvesting and illegal trade to help increase fish, wildlife, and plant adaptation.

Table 18. Key Vulnerabilities of Tennessee Species and Habitats

Climate Change Drivers	Potential Impacts	Key Vulnerabilities
Changes in precipitation timing and duration	• Increased frequency, duration, and intensity of drought •Changes to seasonal timing, frequency, and magnitude of moderate and extreme flood events •Changes to habitat availability for different life history stages •Interactions with water quality conditions •Instream flow management response issues	•Low flow/extreme low flow and base flow alteration could result in reduced habitat quality and connectivity for aquatic species. •Increasingly extreme flood events could lead to habitat destabilization (especially in headwater/smaller order streams), affect spawning cues for some species, and interrupt the availability of feeding and nursery grounds. •Increases in stormwater runoff are likely to exacerbate the input of excess nutrients and toxicity loading and contribute to altered pH and dissolved oxygen levels. •Extreme droughts could alter habitat availability, including breeding habitat and food sources for birds, spawning habitat for mussels and fish, and vernal pools for amphibians.
Increasing temperatures	•Contributions to terrestrial habitat shifts •Relationship to pest and pathogen spread •Changes to freshwater and cave habitat suitability •Interactions with water quality conditions •Contributions to phenological mismatch	• Thermal habitat suitability is likely to be reduced for a number of aquatic species, especially Brook Trout, Hellbenders, and some mussel species. •Increased evaporation could cause drying of vernal pool habitats. •Higher temperatures in caves could harm certain cave fish and bat hibernacula. •Significant shifts in forest habitat types are projected, particularly at higher elevations and in the western portion of the state. •Negative impacts are expected among high-elevation habitat-dependent species such as Rock Vole and Carolina Northern Flying Squirrel. •Spread of pests and pathogens are likely to affect plant and animal species both directly and indirectly. •Phenological mismatch could lead to disruptions in species interactions and mutualisms (e.g., timing of insect emergence and other food sources for birds, fish, and other species).
Altered disturbances (e.g., fire, wind damage, ice storms)	•Contributions to terrestrial habitat shifts •Relationship to spread of invasive species •Damage to habitat	•Increasingly extreme events could have adverse effects on habitat quantity and quality, especially in forest communities. •Altered fire regimes could pose significant challenges for fire management practices.

affecting species and habitats (Stein et al. 2014).

The three elements of Tennessee's vulnerability assessment – priority species, potential vegetation/habitat change, and landscape geophysical settings – as well as the landscape-level assessments of major problems statewide, allow TWRA and conservation partners to examine a variety of specific adaptation actions in different spatial contexts.

The SWAP planning team began this process of identifying preliminary adaptation options for a variety of species, habitats, and their key vulnerabilities. The following themes guided this effort (adapted from NWF 2014):

✦Identify circumstances where managing for habitat and species population changes, rather than persistence, may be appropriate.

✦Consider how conservation goals may need to change over time.

✦Link adaptation concepts to existing management actions.

Table 19. Alignment of NWF general adaptation strategies with three NFWPCAS goals of emphasis in the TN SWAP

NFWPCAS Goal	NWF ClimateSmart General Adaptation Strategy	NWF ClimateSmart General Adaptation Strategy Description
1	Protect Key Ecosystem Features	Focus management on structural characteristics, organisms, or areas that represent important "underpinnings" or "keystones" of the current or future system of interest. This may include protecting features such as the "geophysical settings" (Anderson et al. 2014).
	Ensure Connectivity	Protect, restore, and create landscape features that facilitate movement of organisms (and gene flow) among resource patches.
	Protect Refugia	Protect areas less affected by climate change as sources of "seed" for recovery or as destinations for climate-sensitive migrants.
	Restore Structure & Function	Rebuild, modify, or transform ecosystems that have been lost or compromised, in order to restore or establish desired structures and functions.
2	Support evolutionary potential	Protect a variety of species, populations, and ecosystems in multiple places to bet-hedge against losses from climate disturbances, and where possible manage these systems to assist positive evolutionary change.
	Relocate organisms	Engage in human-facilitated transplanting of organisms from one location to another in order to bypass a barrier.
7	Reduce non-climate stressors	Minimize localized human stressors that hinder the ability of species of ecosystems to withstand or adjust to climatic events.

Tennessee's exposure to climate change and landscape-scale impacts can be summarized in three broad categories: (1) changes in precipitation timing and duration; (2) warming temperatures; and (3) climate effects on the magnitude, severity, and return interval of disturbances (i.e. fire, wind damage, ice storms). These factors, both in isolation and combination, contribute to a variety of natural system vulnerabilities across the state (Table 18).

Appendix J summarizes preliminary adaptation options for different sets of priority species and habitats, all related to shifting precipitation and warming temperatures. These preliminary results focus on the following overarching conservation needs:

✦Maintain and improve hydrologic integrity of aquatic systems to support GCN species populations and habitats.

✦Maintain and improve suitable breeding habitat for migratory birds across their range in Tennessee in collaboration with regional partners.

✦Maintain and increase, as appropriate, the quality and abundance of amphibian breeding habitats.

✦Protect and maintain, where feasible, cold water stream habitat in support of eastern Brook Trout populations.

✦Conserve high elevation (>6000 ft) sites and monitor for potential forest type transition, managing for structure, function, and species migration changes as feasible.



Smoky Mountains: The varied topography of mountainous terrain in east Tennessee has provided a home for many species over the millennium and is a critical region of habitat in the Southern Appalachians – Lee Coursey

✦Maintain stable populations of GCN species experiencing pathogen outbreaks through protection and management of diverse habitats, monitoring, and addressing the impacts of pathogens.

The planning team generated a variety of appropriate adaptation options designed to achieve

these six overarching conservation needs. They are listed in Appendix J, grouped by both NFWPCAS goal (1, 2, or 7) and associated NWF general adaptation strategy. Next steps needed to refine these preliminary adaptation options are to apply them in goal- and outcome-setting exercises for the various species and habitat conservation targets, then evaluate which set of adaptation actions best address the conservation needs and also are feasible to implement (Stein et al. 2014).

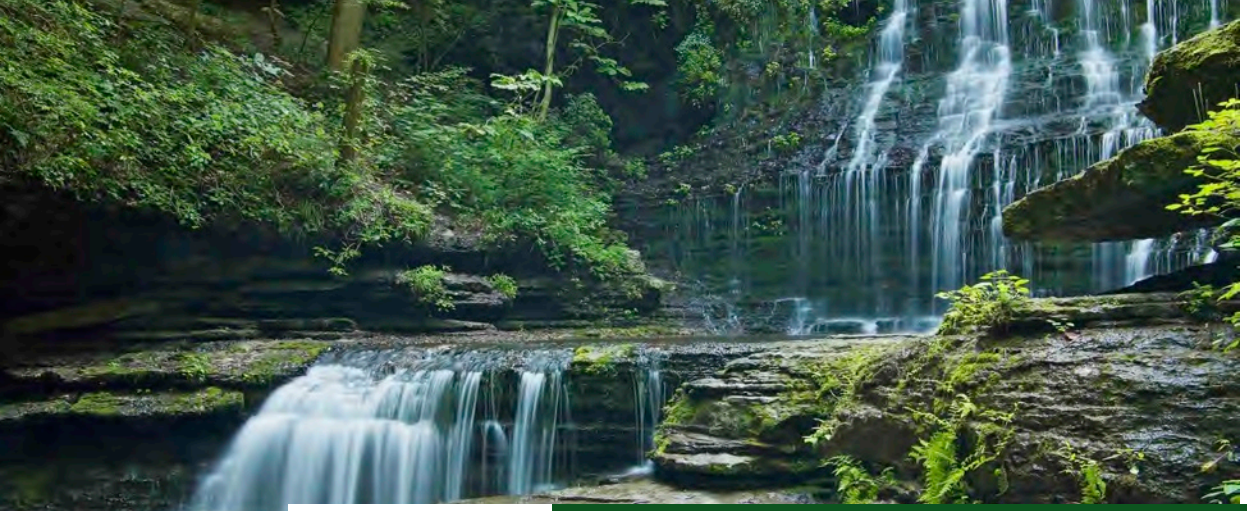
Moving forward, TWRA, in collaboration with its conservation partners, will use the vulnerability assessment information and strategy development framework identified in the 2015 SWAP revision to generate additional adaptation options for priority species and habitats. This effort may include, but is not limited to, identification of new priority areas for acquisition and management; strategies for managing current high priority habitats as they transition to new vegetation states; new priorities for aquatic habitat restoration activities; and decisions regarding alternative management approaches to GCN species populations.



Frozen Head Mountain at Frozen Head Natural Area and State Park, TN - Michael Hodge



Northern Gray-cheeked Salamander, a GCN species - Chris Ogle, TWRA



CHAPTER 6

MONITORING FOR RESULTS AND ADAPTIVE MANAGEMENT

MONITORING OF SPECIES AND HABITATS IS IMPORTANT TO (1) gain a long-term understanding of trends in populations or ecosystem health, (2) provide greater understanding of species responses and needs relative to problems and changing environmental conditions, and (3) assess the results and effectiveness of conservation actions – the key to adaptive management. The first two purposes are collectively referred to as status monitoring, while the last is called effectiveness monitoring.

6.1. The Standards for Measuring Effectiveness of Actions

The 2005 SWAP provided a comprehensive summary of the species and habitat status monitoring conducted by TWRA, other government agencies, academic institutions, and volunteer organizations (see TWRA 2005, pp. 188-198). TWRA has long conducted status monitoring programs to assess and track various wildlife populations (see TWRA 2005, Appendix H "Sampling Protocols for Select Faunal Groups"), both for purposes of management and to identify problems. The results of individual conservation projects are likewise tracked, although often final assessments may consist of cataloguing actions successfully completed.

However, the Association of Fish and Wildlife Agencies in its 2011 *Measuring the Effectiveness of State Wildlife Grants* report notes that, "it has been much more difficult [for state agencies] to bring these two sets of data together to attribute changes in species or habitat status to the effects of any one action" (AFWA 2011). In Tennessee, much of the difficulty lies in ascertaining the status of resources at different spatial

Waterfall at Short Springs State Natural Area - Byron Jorjorian

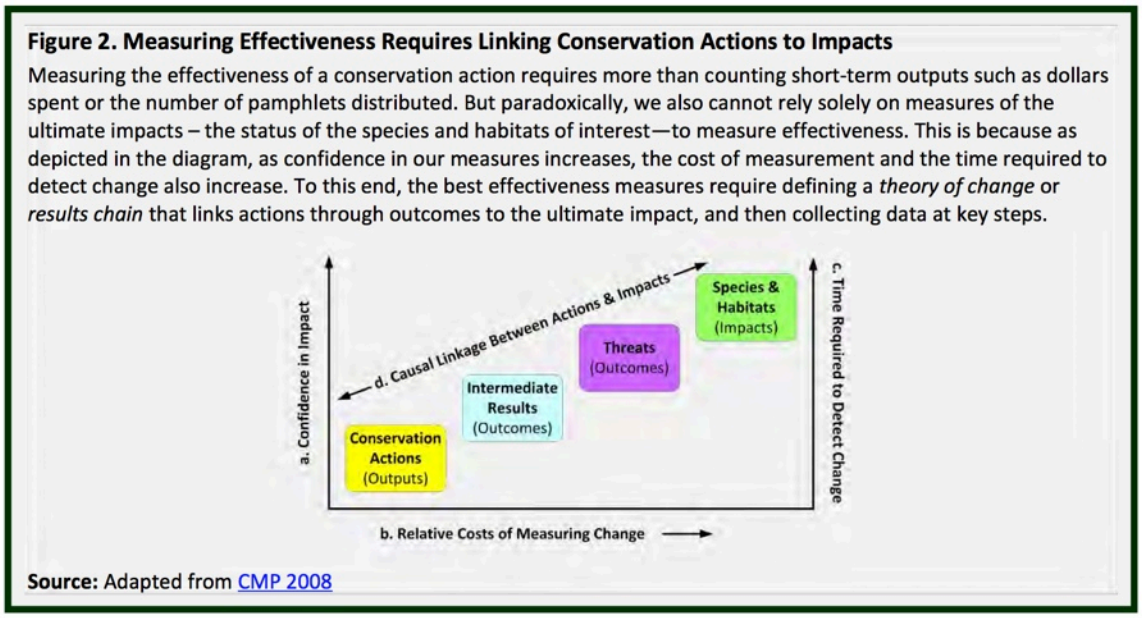
Summary: Monitoring and adaptive management goals in the 2015 SWAP

1. Focus on improving effectiveness monitoring in Tennessee. The 2005 SWAP provided an inventory of TWRA and partner status monitoring programs for species and habitats. The 2015 SWAP introduces effectiveness monitoring and outlines steps for integrating these approaches into existing agency programs and planning cycles.
2. Be explicit about metrics of conservation effectiveness. TWRA has developed a crosswalk of the TN-SWAP specific conservation actions to the U.S. Fish and Wildlife Service's Wildlife/TRACS Reporting System strategy hierarchy. TRACS reporting units have also been assigned for each set of desired changes articulated for the state's Conservation Opportunity Areas.
3. Develop an effectiveness measures framework. TWRA will incorporate status monitoring objectives and effectiveness measures into its existing planning cycles through triennial SWAP reviews and updates.
4. Begin using the Wildlife/TRACS Reporting System. TWRA plans to adopt the format of TRACS conservation measures, using TRACS as an overarching method for tracking and reporting on nongame wildlife monitoring and conservation projects in the state. TWRA will also assess current monitoring data and protocols to incorporate specific effectiveness monitoring approaches for key species and sites.
5. Maximize knowledge and conservation effectiveness through participation in shared monitoring databases.

scales and the connection between different types of conservation actions and results, particularly at landscape scales that necessarily must include at least some private lands. To assist states with making the connections between different types of monitoring, AFWA developed guidance on how to measure the effectiveness of conservation actions funded through the State Wildlife Grants (SWG), including recommendations for how to track and report that effectiveness. The importance of this tracking ultimately goes beyond a consideration of dollars and cents; it cuts to the heart of the stewardship enterprise by providing insight into the overall effectiveness of planning, management, and adaptation to benefit species and habitats.

The Effectiveness Measures report developed a framework for use by states and their partners in

Figure 10. Measuring effectiveness requires linking conservation actions to impact



evaluating the effectiveness of actions funded under State Wildlife Grants, as well as broader conservation strategies outlined in SWAPs (see Figure 10, taken from AFWA's 2011 Effectiveness Measures report). The report also provides comprehensive examples of connecting conservation actions to outcomes, including suggested objective statement formats and monitoring indicators for 11 generic conservation actions. All of these actions are identified in the 2015 TN-SWAP, and conservation partners are encouraged to use these examples as a resource to help design and implement successful conservation projects.



TWRA Wildlife Diversity Coordinator Chris Simpson (left) and TWRA Fisheries Program Manager Mark Thurman seining for GCN fish species in the Roaring River State Scenic River - Mime Barnes, TWRA

6.2. TWRA Adoption of Standardized Effectiveness Measures

The Effectiveness Measures report made several overarching recommendations to states. TWRA will be implementing the following recommendations:

1. Adopt the proposed effectiveness measures framework to improve accountability and project management of State Wildlife Grants.

TWRA has developed a crosswalk of the TN-SWAP specific conservation actions to the U.S. Fish and Wildlife Service's **Wildlife/TRACS Reporting System** Category (Level 1) and Strategy (Level 2) hierarchy (Appendix K). TRACS reporting units have also been assigned for each set of desired changes articulated for the state's Conservation Opportunity Areas (Appendix I).

2. Integrate the effectiveness measures framework into agencies' adaptive management, grant application, and reporting processes; this includes the use of these measures in reporting through the Wildlife/TRACS Reporting System.

TWRA will incorporate monitoring objectives and effectiveness measures into its existing planning cycles through triennial SWAP reviews and updates.

TWRA intends to incorporate status monitoring objectives and effectiveness measures

into its existing planning cycle through triennial SWAP reviews and updates (see Table 20, Ch. 7). These reviews will provide an opportunity to assess conservation achievements in COAs; to prepare and analyze monitoring results; to make adaptive management decisions; and to identify emerging issues and appropriate responses. These reviews will then influence allocation of SWG funds and development of new partnerships. TWRA staff were trained in 2015 how to report these measures for SWG-funded projects in the Wildlife/TRACS Reporting System.

Development and implementation of an effectiveness measures framework will help TWRA and its conservation partners in the following ways:

✦Provide a means to evaluate conservation actions so that successful ones can be replicated and communicated while less successful ones are improved or abandoned;
✦Establish a standardized and accessible body of project performance data to help guide current and future wildlife managers;
✦Provide a cost-efficient mechanism for reporting to Congress, other policy makers, conservation partners, and taxpayers about the value of the SWG program and SWAPs (AFWA 2011).



TWRA Wildlife Diversity Coordinator Rob Colvin holding an Alligator Snapping Turtle - TWRA staff

6.3. Integrating Monitoring and Reporting with TRACS

Through report language in SWG appropriations, Congress has specifically instructed the U.S. Fish and Wildlife Service to work with states to adopt common mapping, data, and measurement standards to facilitate national evaluation and reporting. The Service developed the Wildlife/TRACS Reporting System to track and report on the effectiveness of SWG-funded conservation actions and to make full use of the effectiveness measures developed by AFWA. TRACS will allow data to be collected and aggregated from state and national level databases.

TWRA plans to adopt the format of TRACS conservation measures as an overarching method for tracking and reporting on nongame wildlife monitoring and conservation projects in the state. This will improve the agency's results accounting, project


TWRA Wildlife Diversity Coordinator Scott Dykes with a Golden Mouse - TWRA Staff

monitoring, grant reporting, and determination of SWAP conservation strategies.

Another important goal is to generate spatial project 'footprints' in the TWRA GIS system to provide planners a better overview of their activities in a region.

According to AFWA (2012), TRACS will enhance overall SWAP effectiveness monitoring because it will accomplish the following:

✦Format data in a consistent manner, and encourage conservation partners to provide standardized information.
✦Incorporate the Effectiveness Measures approved by AFWA.
✦Demonstrate effectiveness in a format usable by the U.S. Congress and the Office of Management and Budget (OMB).
✦Provide industries that pay sporting excise taxes with information on the disposition of excise tax dollars and the return on investment of those tax dollars.
✦ Provide accountability and transparency while demonstrating the benefits of wildlife funding programs.



TWRA Wildlife Diversity Biologist Chris Ogle (left) and Wildlife Diversity Coordinator Josh Campbell place a monitoring band on a federally endangered Gray Bat. – Chris Simpson, TWRA

TWRA will begin this process by assessing its current monitoring data and protocols, including status monitoring performed by partners and used by the agency, to define specific effectiveness monitoring approaches for key species and sites where conservation work is planned or ongoing. For example the following programs could be adapted to incorporate effectiveness monitoring objectives:



TWRA Wildlife Manager Bill Smith with Northern Bobwhite - Chris Ogle

✦Shorebird and point count data can be aggregated to develop analyses of responses to habitat change (from restoration, management, climate change, etc.).
✦The use of drift fence monitoring of amphibians at breeding sites could be used to assess the species assemblages pre- and post-

management or pre- and post-restoration, with a particular focus on key projects, such as TWRA's early successional habitat initiative and Quail Focal Areas established in collaboration with the National Bobwhite Conservation Initiative.

✦The SWAP GIS database incorporates updates to land use data from the National Land Cover Database (NLCD) as it becomes available. The NLCD is the definitive Landsat-based, 30-meter resolution, land cover database for the U.S. Comparing land use from one update to the next would provide a comprehensive picture of changes in wildlife habitats at a state scale.



Long-term monitoring is essential to determine the success of species reintroduction efforts, such as reintroduction of the Pale Lilliput mussel into the Duck River in 2014. Crew left to Right: Todd Fobian, Alabama Aquatic Biodiversity Center (AABC); Andrew Henderson, TVA; Paul Johnson, AABC; Steve Ahlstedt (slightly in front), U.S. Geological Survey (retired); Jeff Powell, USFWS; Allen Pyburn, TWRA; Don Hubbs, TWRA; Michael Buntin, AABC; Stephanie Chance, USFWS - photo by Sally Palmer, TNC

6.4. Regional-scale Monitoring Collaborations

One example of how agencies can assess wildlife responses to management is through replicating project strategies and analyzing multiple sets of results over time. In addition, monitoring habitats and populations



Steve Ahlstedt, USGS (retired) and Don Hubbs, TWRA preparing to place mussels into the Duck River - Sally Palmer, TNC



TWRA's Statewide Instream Flow Coordinator Pandy English holding two Northern Black Racers - Scott Dykes, TWRA

over a sufficient geographic area and timeframe can provide insight into how wildlife populations are changing or responding to change. Both of these objectives can be achieved when agencies (1) cooperate to leverage one another's work and knowledge by using monitoring standards that make data comparable, and (2) consolidate data in formats that promote collaborative use.



Jeremy Dennison, TWRA Wildlife Diversity Biologist, holding a Hellbender. - Rob Colvin, TWRA

Several examples of significant monitoring efforts and information sharing include the Tennessee River watershed Index of Biotic Integrity (IBI) work conducted by the Tennessee Valley Authority (TVA); the Great Smoky Mountains National Park All Taxa Biotic Inventory (ATBI); inventory and monitoring conducted by the U.S. Forest Service on federal forest lands; stream flow and biological monitoring managed by the U.S. Geological Survey; and multi-state freshwater mollusk recovery and monitoring activities with the U.S. Fish and Wildlife Service and academic institutions. These program activities, as well as those of many other partners, provide foundational habitat and species population status information that is instrumental to making sound management decisions over time.



Dustin Thames, TWRA Wildlife Diversity Biologist, attaching a radio transmitter to an Indiana Bat - Chris Simpson, TWRA

Solidifying relationships under Memoranda of Understanding or other types of network arrangements can be important mechanisms to ensure this type of critical partnership work is sustainable into the future.

For wide-ranging species such as many birds, TWRA recognizes that regional, national, or flyway-wide databases will enhance each state's ability to manage and conserve these species across broad and biologically meaningful geographic areas. Specifically, the **Avian Knowledge Network** (AKN) is currently developed, supported, and used by many federal, state, and non-profit organizations and has



TWRA Fisheries Program Manager Bart Carter holding a Paddlefish - Scott Dykes, TWRA/below: Carl Williams, TWRA Biologist, using mist net to monitor crayfish, which are released after collecting data. - Bart Carter, TWRA

proven to be extremely effective in providing secure data storage capabilities and facilitating the application of monitoring standards to make datasets comparable across institutions and political boundaries. TWRA considers the exchange and integration of avian data into a permanent centralized data management system a priority action to be accomplished by 2020.

The AKN's Eastern Avian Data Center is an online node that could serve as Tennessee's data entry, storage, and retrieval website. In fact, the AKN already hosts some data from TWRA as well as agency partners. The benefit of this system is an online data interface that allows project or program leaders to easily enter and retrieve data. Another advantage is the community of users that can develop shared tools to analyze data for specific projects and also help to incorporate Tennessee data into larger scale analyses of phenomena such as migration patterns.

Since 2005, TWRA has also invested in the reorganization of its internal data management systems. The new database portals allow consolidation of a variety of project and monitoring data managed internally by TWRA. Compilation of these data ultimately will improve TWRA's ability to share information with other partners and participate in regional-scale monitoring efforts.





CHAPTER 7 TENNESSEE SWAP REVIEW AND REVISION

THE U.S. FISH AND WILDLIFE SERVICE (USFWS) REQUIRES REVIEW of State Wildlife Action Plans (SWAPs) at intervals of 10 years or less. The Association of Fish and Wildlife Agencies (AFWA) recommends that state resource agencies form a working group to assess SWAPs and SWAP implementation, identify best practices, and recommend improvements to SWAPs. In addition, AFWA recommends that SWAP reviews align with other relevant internal conservation planning efforts, for example in Tennessee, TWRA's Strategic Plan. Also, for taxa for which the state has limited authority, staff, or funding (such as insects and plants), agencies are encouraged to engage outside partners and seek additional funding to address these needs. TWRA proposes to engage in a three year review cycle which will provide the foundation for the next ten year comprehensive SWAP review in 2025.

7.1. Integrating Conservation Implementation, SWAP Review, and TWRA Planning Cycles

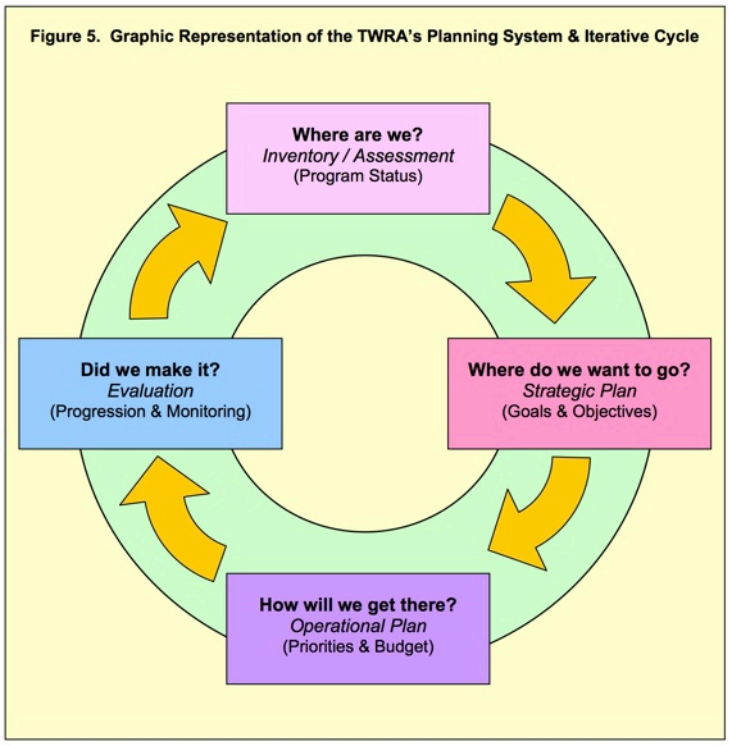
SWAP interim reviews and updates will be incorporated into the agency's comprehensive planning cycle (see Figure 11), by coordinating and sharing information across planning processes and departments within the agency. Table 20 shows the overlap and relationship of the various planning cycles over the SWAP's 10-year timeframe for implementation and revision. Coordination between the 2005 SWAP and TWRA's 2014-20 Strategic Plan has already resulted in a precedent: for the first time, TWRA adopted a habitat-based approach to define the priority management outcomes for its

Photo: Bald Cypress at Hatchie National Wildlife Refuge - Byron Jorjorian

Summary: The SWAP Review and Revision Process 2015-2025

1. Align SWAP reviews with the overall TWRA agency planning cycle. Specifically, integrate TWRA's cycles for SWAP planning with strategic planning, operational planning, and annual planning. The new SWAP planning schedule will include 3 triennial reviews to be rolled up into a draft SWAP update in year 10.
2. Improve partner engagement in SWAP implementation and planning. TWRA proposes to make the SWAP Planning Team as well as the Scientific and Technical Advisors into long-term standing committees. Teams will identify a subset of habitats for interim review (those likely to benefit from or require a shorter review period). Working groups that include conservation partners active in the COAs will review progress in a subset of COAs as part of each triennial SWAP review.
3. Improve and expand data sharing through shared databases and GIS information. TWRA will build upon relationships to reciprocally share and upgrade, on a regular basis, databases and GIS information with the most recent information collected by partners.
4. Identify emerging issues and lessons learned. Emerging issues will be addressed in the planning cycle described, documented with the USFWS, and summarized in subsequent revision documents. TWRA has identified several best practice approaches for improving SWAP implementation and future revisions.

Figure 11. **Graphic representation of the TWRA's planning system and iterative cycle**



Wildlife Resources Program.

Strategic Planning Cycle

TWRA's Strategic Planning cycle recurs at six-year intervals. The Strategic Plan sets forth legal responsibilities, policies, and program structure, and it identifies goals, objectives, problems, and strategies for each program. The SWAP helps inform the planning components for the next iteration of TWRA's strategic plan process, and both the Strategic Plan and SWAP help to guide annual budgetary and operational planning in subsequent years. In year three of the Strategic Planning cycle, a mid-term evaluation is conducted to determine program progress toward Strategic Plan goals. An end-of-cycle evaluation also occurs in year six.

Operational Planning Cycle

Operational Plans are site-specific plans that guide the management of discrete state-owned units, such as Wildlife Management Areas (WMAs). The primary management objectives for WMAs typically focus on

game species management. The role of diversity staff in operational planning is primarily to ensure that the impacts to species of nongame/GCN animals, GCN plants, and significant natural communities are minimal, while promoting management strategies that improve GCN species habitat. Operational Plans are informed by both Strategic Plan Goals and SWAP priorities.

Annual Project Evaluation Cycle

Within 90 days of the fiscal year closing, every TWRA project is subjected to an annual evaluation according to established performance measures. Beginning in 2016, this process will include evaluation according to the Effectiveness Measures guidelines recommended by AFWA (see Chapter 6), and project performance data will be entered into the TRACS reporting system, while project spatial data will be entered into the SWAP GIS relational database as well. These evaluations will assess the effectiveness of SWG-funded and other projects, inform future SWAP priorities, and provide a measure of progress toward Strategic Plan goals.

By including partners in SWAP 3-year reviews, the agency is fostering the incorporation of SWAP priorities into the strategic planning efforts of other agencies and organizations.

SWAP Planning Cycle

The SWAP will be updated iteratively on a cycle of 3-year reviews and will focus on progress made in COAs; documentation of collaborative efforts and the work of partners in support of the SWAP; responses to emerging issues; and the incorporation of results from SWG and other project evaluations (to be assessed annually, with data loaded into TRACS). The results of three triennial reviews would then be rolled up into a draft SWAP update in year 10.

To accomplish interim SWAP progress reviews, TWRA proposes to make the SWAP Planning Team as well as the Scientific and Technical Advisors (drawn from many partner organizations and agencies) into long-term standing committees. The annual SWG project review



Partners from state and federal agencies participating in the 2015 SWAP revision. - Lindsay Gardner, Southeast Aquatic Resources Partnership

process and the triennial SWAP reviews will inform TWRA's annual budget planning cycles, as well as the activities of other TWRA divisions. For example, the Environmental Services and Real Estate divisions rely on GCN species location data and habitat priorities when reviewing permit applications, developing grants, and targeting land acquisition.



Big South Fork National Recreation Area is encompassed within the North Cumberland Plateau and Mountains Conservation Opportunity Area. - Byron Jorjorian

Habitats selected for review will be identified by the SWAP Planning Team and Scientific/Technical Advisors as those likely to benefit from or require a shorter review period. COA reviews will be developed by working groups that include conservation partners active in the COAs. By including partners in SWAP 3-year reviews, the agency is fostering the incorporation of SWAP priorities into the strategic planning efforts of other agencies and organizations. Multiple partnerships will also promote leveraging of SWG and other conservation funds, while increasing the state's capacity to achieve priority conservation goals.

Shorter SWAP review cycles within the 10-year update period will also foster:

✦More timely and effective response to unforeseen emerging issues, such as changes related to climate, pathogens, or other stressors;
✦Greater continuity and flexibility in dealing with staff turnover and the potential for loss of institutional knowledge;
✦The development of annual objectives that can build toward achieving more long-term goals.

7.2. SWAP GIS Relational Database Updates

In addition to documenting project evaluation data annually, and to ensure that Tennessee's SWAP remains a "a living plan," TWRA will build upon relationships already established between the Agency and The Nature Conservancy, the Natural Heritage Inventory Program within the Tennessee Department of Environment and Conservation Division of Natural Areas, and the Tennessee Valley Authority to

reciprocally share and upgrade, on a regular basis, databases with the most recent information each organization has collected. TWRA will also explore the possibility of expanding this partnership to other pertinent agencies, such as the Tennessee Division of Forestry, Tennessee Department of Transportation, U.S Department of Agriculture Natural Resources Conservation Service, the U.S. Fish and Wildlife Service, and other partners as appropriate. TWRA also will explore opportunities to share information on priorities and projects through different types of website interfaces for partners and the general public, with access and data protocols designed to protect sensitive information and ensure appropriate application of the data.

7.3. Emerging Issues

Inevitably, new issues will arise in between the 10-year comprehensive review cycles for State Wildlife Action Plans. SWAP Best Practices guidance indicates that these emerging issues can be addressed through "documented coordination with the U.S. Fish and Wildlife Service . . . as long as the issue is included in the next revision" (AFWA 2012).

The devastating onslaught of White-nose Syndrome (WNS) in bat populations across the eastern U.S., and its arrival and impacts in Tennessee since early 2010, illustrates the dynamic nature of wildlife conservation management and the need for effective responses to emerging issues. "Parasites and pathogens" were identified as a problem during the 2005 SWAP effort; however, WNS had not yet advanced and caused drastic population declines in cave-dwelling bats. In less than 10 years, however, even those bat species whose populations were stable prior to the onset of WNS have declined significantly. TWRA and its conservation partners have invested heavily in population monitoring, cave management, and disease abatement strategies for the past five years, and WNS is now identified within this 2015 update as an ongoing management challenge.



Holiday Darter - Jeremy Monroe, Freshwaters Illustrated



Eastern Meadowlark, like many grassland animals, a species of Greatest Conservation Need - Thomas Blevins

With time, emerging issues likely will include challenges associated with both temperature and precipitation shifts from a changing climate, and potential conflicts between resource uses and habitat needs. For example, more frequent and prolonged droughts may increase the demand for irrigated agriculture in Tennessee, which can result in more pressure on groundwater resources in the western part of the state and surface water streams in middle and east Tennessee. At the same time, these water resources provide public drinking water supplies, wastewater assimilation, recreation, and diverse species habitats.

Other examples of potential emerging issues in the future may involve consideration of the special habitat needs of insect pollinators. Pollinators play a crucial role in the health of overall ecosystems and maintenance of plant diversity in many habitat types (The Heinz Center 2013). Assessing the status of pollinators in Tennessee and their potential management needs could be considered emerging issues in future plan iterations.

Addressing these types of challenges requires a commitment to collaboration among many agencies and stakeholders, particularly through advance planning and a willingness to share information in trans-parent decision-making processes. For the SWAP, emerging issues will be addressed on the planning cycle described, documented with the USFWS, and summarized in subsequent revision documents.



Eastern Carpenter Bee - Bob Peterson

7.4. Lessons Learned from Tennessee's SWAP Review and Revision

The following is a list of ideas and potential next-step actions from Tennessee's SWAP planning team that could improve TWRA's processes in preparing for the next iteration of SWAP revision:

✦Organize all plans, monitoring reports, and other useful documents on a

comprehensive internal server and staff-accessible drive to facilitate compiling pertinent information for the next revision.

✦Improve TWRA staff training in use and application of SWAP GIS data and TRACs.

✦Maintain regularly updated maps of conservation action and project locations.

✦Have staff or interns compile status survey data results by project, so that not only accomplishments but results of conservation management can be incorporated into SWG funding, project planning, and future SWAP goals.

✦Ensure that data entry protocols for projects are established and clear, and that all individuals conducting data entry work are trained in data quality control standards as appropriate.

✦Develop a culture of documenting conservation stories to share with partners and the public. For example, what are the interesting management activities (involving odd equipment, rare animals) that TWRA biologists and partners undertake, which the public does not know about or understand, and how can they be captured in photographs and stories? Organize and archive field photos, with credits, of TWRA and partners for use in a variety of media communications.

✦Communicate regularly and intentionally with agency partners, non-governmental organizations, and other stakeholders about ongoing work and to foster collaborative efforts and engagement in conservation efforts.

These types of specific activities, in conjunction with a more standardized review process aligned with TWRA's overall planning cycles, will help the agency more efficiently address the U.S. Fish and Wildlife Services's SWAP revision requirements over time, improve public awareness and engagement with species and habitat conservation in Tennessee, and ultimately increase the success of conservation efforts.



Green Anole next to a TWRA badge - Josh Campbell, TWRA

Table 20. TWRA Planning Cycles

	The Strategic Plan focuses on priority habitats identified in the SWAP; uses project evaluations and SWAP 3-year reviews to assess progress	Operational plans guide specific stewardship activities to achieve Strategic Plan goals; GCN species and habitat priorities are guided by the SWAP	Project evaluations inform TWRA management, COA projects and partnerships; are entered spatially in GIS relational database and reported	Annual budgets are informed by past project priorities and results; they factor in SWG and partner funding proposals	SWAP triennial reviews/updates: include key partners, review of annual project evaluations, response to emerging issues, and development of new projects and funding partnerships as needed
Year	**Strategic Plan Cycle (2014 = year 1)**	**Operational Planning (WMA and other plans)**	**Annual Project Evaluations, (SWGs +)**	**Annual Budget Planning Cycle**	**State Wildlife Action Plan Cycle (2016 = year 1)**
2015		SWAP GCN species habitat priorities, objectives, and stewardship recommendations developed for incorporation into Operational Plans developed to achieve Strategic Plan goals on TWRA-owned lands		Data/results from previous year project evaluations informs budgeting	SWAP Update Approval; establish permanent planning & science advisory committees
2016			First annual review of projects under SWAP 2015, according to Effectiveness Measures guidelines; TRACS data entered	Data/results from previous year project evaluations informs budgeting	Establish working groups that include partner participation for a subset of high priority COAs
2017	3-year evaluation of agency program progress toward achieving Strategic Plan goals		Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	
2018			Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	1st triennial review: COA work groups assess conservation progress; evaluate TRACS project data; assess emerging issues/potential new partnerships; coordinate with Strategic Planning
2019	Next Strategic Plan Cycle begins; incorporates annual project reviews and SWAP review data		Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	
2020	End-of-cycle evaluation assesses achievement of Strategic Plan goals		Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	

	The Strategic Plan focuses on priority habitats identified in the SWAP; uses project evaluations and SWAP 3-year reviews to assess progress	Operational plans guide specific stewardship activities to achieve Strategic Plan goals; GCN species and habitat priorities are guided by the SWAP	Project evaluations inform TWRA management, COA projects and partnerships; are entered spatially in GIS relational database and reported	Annual budgets are informed by past project priorities and results; they factor in SWG and partner funding proposals	SWAP triennial reviews/updates: include key partners, review of annual project evaluations, response to emerging issues, and development of new projects and funding partnerships as needed
Year	**Strategic Plan Cycle (2014 = year 1)**	**Operational Planning (WMA and other plans)**	**Annual Project Evaluations, (SWGs +)**	**Annual Budget Planning Cycle**	**State Wildlife Action Plan Cycle (2016 = year 1)**
2021	New Strategic Plan approved (2021-2027)		Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	2nd triennial review: COA work groups assess conservation progress; evaluate TRACS project data; assess emerging issues/potential new partnerships; coordinate with Strategic Planning
2022		SWAP GCN species habitat priorities, objectives, and stewardship recommendations developed for incorporation into Operational Plans developed to achieve Strategic Plan goals on TWRA-owned lands	Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	
2023			Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	
2024	3-year evaluation of agency program progress toward achieving Strategic Plan goals; coordinate with SWAP Update		Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	3rd triennial review: COA work groups assess conservation progress; evaluate TRACS project data; assess emerging issues/potential new partnerships; coordinate with Strategic Planning
2025			Annual review of projects/ effectiveness; TRACS data input	Data/results from previous year project evaluations informs budgeting	SWAP Update #2: incorporate 3 previous triennial SWAP reviews

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Glossary of Terms

acid deposition - also known as acid rain, is an environmental phenomenon caused by air pollutants, mainly nitrates (NOX) and sulfates (SOX) primarily from burning fossil fuels. Acid deposition is characterized by extremely high acidity which is particularly harmful to sensitive ecosystems.

aquatic ecological system - dynamic spatial assemblages of ecological communities (e.g. rivers, streams, and lakes) with similar geomorphological patterns tied together by ecological processes (e.g. hydrologic and nutrient regimes, access to floodplains) or environmental gradients (e.g. temperature, chemical and habitat volume), and form a cohesive, distinguishable unit on a hydrography map.

barrens - Tennessee's barrens ecosystems are typically mosaics of open canopy woodlands, or lacking trees altogether, with a dominance of perennial grasses and herbaceous species

bioaccumulation - the process by which organisms can take up contaminants more rapidly than their bodies can eliminate them.

biodiversity - the full range of natural variety and variability within and among living organisms, and the ecological and environmental complexes in which they occur. It encompasses multiple levels of organization, including genes, species, communities, and ecological systems or ecosystems.

bioenergy - a general term that encompasses both biofuel and biomass as sources of energy generation.

biofuels - biofuels, generally defined as liquid fuels derived from biological materials, can be made from plants, vegetable oils, forest products, or waste materials. The raw materials can be grown specifically for fuel purposes, or can be the residues or wastes of existing supply and consumption chains, such as agricultural residues or municipal garbage.

biomagnification - also known as bioamplification or biological magnification, is the sequence of processes in an ecosystem by which higher concentrations of a particular chemical, such as DDT or mercury, are reached in organisms higher up the food chain, generally through a series of prey-predator relationships.

biomass - solid organic materials produced in a renewable manner for energy generation. Two categories of biomass fuels, woody fuels and animal wastes, comprise the vast majority of available biomass fuels.

buffer - conservation buffers are small areas or strips of land in permanent vegetation, designed to slow water runoff, provide shelter and stabilize riparian or other habitat areas. Strategically placed buffer strips in the agricultural landscape can effectively mitigate the movement of sediment, nutrients, and pesticides within farm fields and from farm fields.

conservation action - any act taken to directly abate a stress or source of stress to a target species or habitat, or to prevent the future development of a stress upon a species or its habitat.

conservation goal - in conservation planning, the number and spatial distribution of on-the- ground occurrences of targeted species, natural communities, and ecological systems that are needed to adequately conserve the target in an ecoregion.

Conservation Opportunity Area - Priority areas for conservation, spatially depicted on the landscape, that offer the best opportunities and potential for conservation of species of greatest conservation need and their habitats.

dam - any structure that impounds water.

decline/declining - the historical or recent decrease of a conservation target through all or part of its range. Declining species exhibit significant, long-term decreases in habitat and/or numbers, are subject to a high degree of threat, or may have unique habitat or behavioral requirements that expose them to great risk.

diadromous - Fish that can live in and are migratory between fresh waters and salt waters.

disjunct - distributional range of a species or community which is found in an ecoregion a significant distance from its primary range in other disconnected ecoregions. Disjunct species have populations that are geographically isolated.

distribution pattern - the overall pattern of occurrence for a particular conservation target. In ecoregional planning, distribution patterns are often described in terms of the relative proportion of the target's natural range occurring within a given ecoregion (i.e. endemic, limited, disjunct, peripheral, and widespread).

dry bed retention dam - a dry detention basin temporarily detains and stores collected stormwater runoff for a period of time, releasing the stormwater slowly to reduce flooding and remove pollutants. It is referred to as "dry" because it dries out between rain events. Pollutants are removed by allowing particulates and solids to settle out from the water. Detention does not normally occur until the inflow rate exceeds the design outflow rate.

dry-mesic (forest) - Oak or oak-hickory forest type (typically), characterized by well-drained soils and episodic fire.

ecological systems - ecological systems are dynamic assemblages of native plant and/or animal communities that 1) occur together on the landscape or in the water, 2) are tied together by similar ecological processes (e.g., fire, hydrology), underlying environmental features (e.g., soils, geology), or environmental gradients (e.g., elevation).

ecoregion - a relatively large geographic unit of land and water defined by the climate, vegetation, geology, and other ecological and environmental patterns.

element occurrence (EO) - a term originating from methodology of the Natural Heritage Program network that refers to species, natural communities, or other entities (e.g. migratory bird stopovers, ecological systems) of biodiversity that serve as both conservation targets and as units for organizing and tracking information.

endemic - distributional range of a species or community which primarily or only occurs in one specific area

eutrophication - the process by which a body of water acquires a high concentration of nutrients, especially phosphates and nitrates. These typically promote excessive growth of algae. As the algae die and decompose, high levels of organic matter and the decomposing organisms deplete the water of available oxygen, causing the death of other organisms, such as fish. Eutrophication may be a natural, slow-aging process for a water body, but human activity can greatly speed up or amplify the process.

global rank - a numeric assessment of a biological element's relative imperilment and conservation status across its range of distribution ranging from G1 (critically imperiled) to G5 (secure). Assigned by the Natural Heritage Programs, global ranks for species and natural communities are determined primarily by the number of occurrences or total area of coverage (communities only), modified by other factors such as condition, historic trend in distribution or condition, vulnerability, and threats.

Greatest Conservation Need - a designation determined by each state's fish and wildlife agency, which identifies the species and their associated habitats that are most at risk, threatened, or deserving of conservation action for other reasons.

green infrastructure - a strategically planned and managed network of natural lands, working landscapes, and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.

habitat fragmentation - occurs when large ecosystems are separated into smaller pieces, separating and isolating groups of species and habitats from one another, which impacts breeding patterns and may lead to inbreeding.

headwaters - the source area where a river or stream begins in a landscape.

hibernacula - (single hibernaculum) location where a creature seeks shelter over the winter, such as bats using a cave.

incompatible management practices - incompatible practices modify habitat composition, type, and/or ecological processes in a way that is not compatible with the needs of target wildlife or plant species.

instream flow - the natural variations of water levels in rivers and streams, critical to the maintenance of biodiversity and other values, such as recreation, in aquatic ecosystems.

invasive exotic species - nonindigenous species which have been introduced either intentionally or accidentally into areas outside their natural range and that have the capacity to outcompete native species either reproductively or for natural resources.

karst - landscape formed from the dissolution of soluble rocks including limestone, dolomite and gypsum. Karst is characterized by sinkholes, caves, and underground drainage systems.

keystone species - species with an important role in ecosystem function, such as top carnivores.

limited - distributional range of a species or natural community which occurs in the ecoregion and within a few other adjacent ecoregions.

mesophytic (forest) - a forest that generally receives a moderate amount of moisture.

natural communities - terrestrial plant communities of definite floristic composition, uniform habitat conditions, and uniform physiognomy. Natural communities are defined by the finest level of classification, the "plant association" level of the National Vegetation Classification. Like ecological systems, natural plant communities are characterized by both a biotic and abiotic component.

natural process - processes in nature that play a vital role in ecosystem function by causing change or disturbance on a cyclical basis, such as flooding, fire, or plant succession. Habitat restoration can sometimes be achieved by incorporating natural processes into conservation designs.

occurrence - a spatially referenced location of a species or a location of a natural plant community or ecological system. Many occurrences are tracked by the various Natural Heritage Programs and are known as Element Occurrences. Occurrences may also be more loosely defined locations delineated through the definition/mapping or other spatial data or through the identification of areas by experts.

parcelization - generally refers to the division of ownerships that result in smaller holdings of land which, in turn, results in constrained management options and potentially adverse effects on ecosystem health and wildlife habitat. Parcelization is caused by subdividing large tracts into smaller forest tracts, ranchettes for residential use, or sale of large tracts to buyers who further subdivide the land.

prescribed fire - fire that is purposely lit under controlled conditions and guided by a burn plan to improve ecological health, reduce fuel loads that contribute to catastrophic fire, or achieve desired habitat conditions.

propagation - the breeding of plants or animals for reintroduction into suitable habitats as supplementation of existing populations or as a means of restoring locally extirpated populations.

problem - the combined concept of ecological stresses to a target and the sources of that stress to the target.

refugia - (single refugium) areas in which a population of organisms can survive through a period of unfavorable conditions.

rockhouse - a rockhouse is an area that typically has been eroded away by a stream under a large rock or bluff line. Common on the Cumberland Plateau, they are typically found in sandstone where the old stream meandered next to a rock bluff. .

sinkhole - a cavity in the ground, especially in limestone bedrock, caused by water erosion and providing a route for surface water to disappear underground.

source (of stress) - an extraneous factor, either human (i.e. activities, policies, land uses) or biological (e.g. non-native species), that infringes upon a conservation target in a way that results in stress.

species richness - the number of different species represented in an ecological community, landscape or region.

stress - something which impairs or degrades the size, condition, or landscape context of a conservation target, resulting in reduced viability.

split estate - in split estate situations, the surface rights and subsurface rights (such as the rights to develop minerals) for a piece of land are owned by different parties.

sprawl - low-density decentralized development at the fringes of a central city. It is characterized by a spreading out of development over a wide area with little or no connectivity to the contiguously developed area.

stream connectivity - streams, from headwaters to large rivers, provide pathways for the transport of a wide range of materials, energy and aquatic life. This transport moves upstream and downstream, between surface and groundwater, between channel and floodplain and in time, i.e. seasonal flooding or scouring.

stocking - relative to fish or other aquatic organisms, the practice of raising organisms in a hatchery and releasing them into appropriate lake, stream, or other aquatic habitat.

substrate embeddedness - the degree to which fine sediments surround coarse substrates on the surface of a streambed.

succession - the process of change in the species structure of an ecological community over time. Generally resulting in increasing structural complexity over time until a community becomes relatively stable or self-perpetuating in the absence of disturbance.

tailwater - waters located immediately downstream from a hydraulic structure, most often a dam.

target - specific components of biodiversity which serve as the focus of conservation, including the development and prioritization of conservation strategies. Conservation targets consist of ecological systems, natural communities, and species.

translocation - the capture, transport, and release or introduction of species, habitats or other ecological material from one location to another.

troglobite - an animal that cannot survive outside its cave environment.

troglophile - an animal able to live its entire life in a cave, but usually maintain some of their senses such as partial pigmentation and are usually only partially blind.

trogloxene - an animal that uses caves for shelter but does not complete its life cycle in them, for example bats.

umbrella species - a species or group of species, such as forest interior dwelling birds, whose habitat needs overlap those of other animals and plants.

viable/viability - the ability of a species to persist for many generations, or a natural community or ecological system to persist over some time period. An assessment of viability will often focus on the minimum area and number of occurrences and presence of natural processes necessary for persistence.

viewshed - the geographical area that is visible from a location. It includes all surrounding points that are in line-of-sight with that location and excludes points that are beyond the horizon or obstructed by terrain and other features (e.g., buildings, trees).

volant - able to fly or glide.

widespread - distributional range of a species or natural community which is typically found in the ecoregion, but common in many others also; the bulk of distribution may be elsewhere however.

vulnerability - the inability to withstand the effects of a hostile environment, generally measured by degree of exposure to hostile elements or change, inherent sensitivity to that exposure, and adaptive capacity to accommodate change.













Credits clockwise from top left: Lamprey on a Striped Shiner - Jeremy Monroe, Fisheries Illustrated; Streamside Salamander - Matthew Niemiller; Western Sandpiper - Chris Sloan; Bog Turtle - Jeffrey Basinger, Fisheries Illustrated; Upland Burrowing Crayfish - Carl Williams, TWRA; Little Brown Bats - Chris Ogle, TWRA

Tennessee State Wildlife Action Plan 2015

Appendix A - Overview of AFWA Best Practices for State Wildlife Action Plans addressed in the Tennessee State Wildlife Action Plan

TN-SWAP 2015 APPENDIX A: Overview of AFWA Best Practices for State Wildlife Action Plans addressed in the Tennessee State Wildlife Action Plan

Setting Conservation Priorities

- Engage multiple stakeholders in the prioritization process.
- Be explicit and transparent about which criteria are used so it will be clear and repeatable to any user how the priorities were established.
- Strive for a comprehensive, multi-scale approach and direct conservation efforts toward biodiversity at the coarsest scale an area can support, and then determine the extent to which ecosystems and species at finer scales can be targeted.

Element 1: Species of Greatest Conservation Need

Information on the distribution and abundance of species of wildlife including low and declining populations as the state fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the state's wildlife

Assessing Conservation Status

- To increase consistency when comparing SGCN lists across states, use accepted or official taxonomic standards for plant and animal species.
- Use NatureServe ranking procedures to characterize risk of extinction and extirpation of species and ecosystems.
- In addition, update the SGCN list early in the revision process to make it available for revisions of other sections.

Element 2: Key Habitats

Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified

Habitat Classification Standards and Systems

- When selecting a habitat classification system, ensure that map units are identifiable, scalable, and model-able.
- Use a well-accepted hierarchical vegetation classification standard to classify land cover or habitats for SWAPs. Examples include NatureServe's Terrestrial Ecological Systems of the United States (Comer et al. 2003, NatureServe 2012b) or the US National Vegetation Classification (USNVC) (GreenInfo Network 2012).
- While the development of standardized classification systems for aquatic habitats is less advanced than for terrestrial systems, there are some existing and some emerging regional systems that could be useful. If your region has a standardized system, use it.

Mapping and Modeling

- Identify and spatially depict priority areas on the landscape that offer the best opportunities and potential for SGCN conservation as determined by each state, and use the generic term Conservation Opportunity Areas (COAs) for these focal areas.
- Incorporate existing spatial priorities developed from other multistate conservation planning efforts or partners if the goals and fundamental assumptions are compatible with the SWAP.
- Clearly articulate the purpose and intended use of all maps, underlying assumptions and limitations, and timeline for updating the maps. Map development methods should also be transparent and repeatable. Clearly state that the use of the generic term "COA" does not imply use of a standardized methodology (since no such thing exists). Several states have reported conflicts with partners and stakeholders due to having published maps without adequately communicating what the maps are meant to depict and how they should, and should not, be used.
- To overcome the inconsistency and incompatibility of scale, and to create seamless planning products across partnership boundaries within states (and as appropriate for regional or national projects), align SWAPs along ecological boundaries (e.g., Bailey's ecoregions, The Nature Conservancy's (TNC) Ecoregions, Omernik's ecoregions, the National Geographic Framework [LCCs]).
- Use models (e.g., ESSA Technology's Vegetation Dynamics Development Tool and Cumulative Effects Analysis Tool, etc.) to forecast landscape-scale vegetation dynamics through time.
- Select classification systems, mapping units, and other such methodologies and data sources that will support the ultimate integration of SWAP priorities into future implementation of regional and national conservation initiatives.
- Maintain flexibility in modeling methodology to keep models dynamic and capable of incorporating new and revised data sets, as well as to ensure their currency, and avoid producing a single decision output hindered by model preconceptions.

Element 3: Problems affecting species and habitats

Descriptions of problems which may adversely affect species identified or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats

Threats

- Use the definitions and hierarchical classification in Salafsky et al.'s (2008) *A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions* to describe the general components of any given conservation project and to categorize threats.

- Clearly distinguish among stresses, direct threats, contributing factors sensu Salafsky et al. (2008).

Climate Change

- Include climate change and its impacts as one of the criteria used in selecting and prioritizing SGCN.
- Follow recommendations outlined in AFWA's *Voluntary Guidance for States to Incorporate Climate Change into State Wildlife Action Plans and Other Management Plans*—specifically as described in "Chapter 3: SWAP Revision Process" (Association of Fish and Wildlife Agencies 2009).
- Conduct vulnerability assessments to inform the selection of SGCN and conservation actions. Use *Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment* (Glick et al. 2011b) to determine the best approach for conducting a vulnerability assessment for habitats and species at an appropriate level (as determined by each state).
- Link climate impact to priority actions. Using the best available climate data, specify which impact (e.g., sea-level rise, prolonged drought, increased precipitation, increased fire, etc.) will result in which threat, and which action will address that impact.
- Integrate key characteristics of climate-smart conservation when developing conservation actions (see http://www.nwf.org/Home/ Global-Warming/Climate-Smart- Conservation/Adaptation- Principles.aspx). Example characteristics include: consider broader landscape context, develop forward-looking goals, and consider climate impacts on conservation action or project success.
- Consider key adaptation approaches when developing conservation actions as described in West et al. (2009). Examples include: reduce non-climate stresses, protect key ecosystem features, and ensure connectivity.
- Work with regional partners such as Landscape Conservation Cooperatives (LCCs) and Department of Interior Climate Science Centers (CSCs) to use climate information and resources as well as ensure that they incorporate state-based information into their programs and resources.

Mitigation

- Cultivate awareness, support, and partnerships between the agencies/divisions responsible for SWAP implementation and the agencies/divisions responsible for mitigation oversight.
- Include spatially-explicit layers of high-priority areas to facilitate the use of SWAPs in mitigation efforts.

Element 4: Prioritize conservation actions
Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such action

Conservation Actions

- Use the definitions and hierarchical classification in Salafsky et al.'s (2008) *A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions* to describe the general components of any given conservation project, and categorize conservation actions. The 2015 TN SWAP update utilized the February 2015 beta V2 version of the Salafsky et al. (Conservation Measures Partnership) threats hierarchy.
- Design conservation actions to abate known threats and indicate metrics to measure effectiveness of conservation actions.
- Write conservation actions broadly enough to allow flexibility, yet with enough specificity to measure performance and engage partners.

Element 5: Monitoring & Adaptive Management
Proposed plans for monitoring species identified and their habitats, for monitoring the effectiveness of the conservation actions proposed, and for adapting these conservation actions to respond appropriately to new information or changing conditions

Effectiveness Measures

- Design monitoring programs with the aim of making the resulting data as useful to conservation and science as possible (see Nichols and Williams 2006).
- Use scientifically-sound monitoring protocols designed to detect changes that will inform assessments of SWAP effectiveness.
- Assess populations, habitats, and effectiveness at multiple scales. Trends observed within a state's boundaries are often best understood within a broader spatial and temporal context. Collaborate with other agencies and NGOs in established, long-term, multistate efforts to contribute to, and gain from, broader spatiotemporal perspectives of status and trends.
    - Collaborate with existing monitoring programs, including the North American Breeding Bird Survey, Audubon Christmas Bird Count, Xerces Society Fourth of July Butterfly Count, North American Amphibian Monitoring Program, and Marine Mammal Stranding Network.
    - Coordinate state-level habitat monitoring with forest condition data from the USDA Forest Service Forest Inventory and Analysis National Program, and landscape level fish habitat conditions from the National Fish Habitat Partnership (Esselman et al. 2009).
    - Participate in research and conservation alliances such as Landscape Conservation Cooperatives (LCCs), international bird conservation groups, and regional agency associations. These organizations can provide a framework

for discussions of monitoring and reporting needs, development of funding proposals, and seamless integration of monitoring efforts.

- Specify assessable objectives for each conservation action and select performance measures appropriate for each objective. Employ the AFWA Effectiveness Measures in project planning and implementation.

Element 6: Procedures for review & revision

Descriptions of the procedures to review the strategy at intervals not to exceed ten years

State and USFWS Coordination Before and During Revision Processes

- Use Table 1 below to supplement the 2007 joint USFWS/AFWA *Guidance for State Wildlife Action Plan (Comprehensive Wildlife Conservation Strategy) Review and Revisions* to better understand the requirements and best practices for the three types of SWAP revisions.

Comprehensive Review and Revision Package Documents

- Use the Submittal Checklist (pg. 27) for preparing the submittal package, appropriate to the level of revision.

Review and Revision Frequency

- Align review interval with other relevant conservation planning documents to identify shared conservation actions and objectives, and to be mindful of the timeframes for conservation outcomes.

Addressing Emerging Issues

- Changes to SWAPs to reflect emerging issues, including changes to a living online database connected to and informing SWAPs, can be addressed through documented coordination with the USFWS Regional Office rather than through a formal review/revision as long as the issue is included in the next revision.

Element 7: Coordination with Partners

Design and execute approaches for coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats.

Conservation Partner Engagement

- Provide mechanisms for conservation partner engagement to further collaboration and understanding of how their input is used and valued (e.g., incorporate crosswalks, use online comment retention, and provide regular updates).

- For key taxa (e.g., insects, plants) and other needs which the state has limited regulatory authority, staff expertise, or funding, include those taxa in the SWAP but engage outside partners (e.g., taxa-based or targeted professional societies, conservation organizations, other agencies with authority, universities) or seek additional funding to create a more comprehensive vision of SGCN, habitats, threats, and conservation actions.
- In consultation with conservation partners, scale the level of partner participation (plus associated staff time and other resources related to that outreach) with the type/degree of review/revision (i.e., comprehensive review would benefit from more extensive, broad partnership engagement than a minor revision).
- Ask conservation partners to feature the state's review/revision updates, including public information meetings and requests for comments, in their constituency communications (e.g., newsletters, Web sites, social media updates, e-blasts).
- Provide recognition for partners that contributed significantly to the SWAP to instill a sense of ownership and desire to protect and implement the plan.

SWAP Ease of Use and Accessibility

- To reduce length, incorporate information by reference rather than reiterating text (e.g., refer reader to the best resources for detailed species accounts).
- Send a hardcopy and link of approved revisions to AFWA to update the national SWAP Web site.
- Also send SWAP Coordinator contact information to AFWA as needed.
- Provide a Web link to the entire document as well as a segmented and searchable version of the SWAP, using software that is easily accessible and used by the public and diverse audiences (e.g., free software downloads online such as Adobe Reader for PDF file viewing). Ideally, provide a linked set of documents, references, tools, etc. that are easily updated, compared to a static, fixed documents.
- Create a section or companion document, or refer the reader to resources (e.g., The Conservation Registry, NatureServe, the National Geographic Society's LandScope America, USFWS Wildlife TRACS) on project effectiveness, conservation progress, successes, and implementation efforts that have been realized, or are in progress as a result of the SWAP.

Partnerships

- Develop partnerships early on and revisit them as often as necessary to promote ownership and buy-in, maintain positive, supportive relationships, and ensure that SWAPs are *state* plans rather than *state agency* plans. Formalize partnerships as appropriate.

- Strategically create committees and teams for development, revision, and implementation. For each committee, determine which skills, knowledge, and decision-making authorities are needed to strategically target potential members.
    - Include broad agency perspectives.
    - Throughout the lifetime of the SWAP, maintain a regular working relationship with the implementation committee by convening joint planning and reporting meetings.
- Cultivate a partnership with the Natural Resources Conservation Service (NRCS). Identify key NRCS staff and engage them in SWAP implementation committees.
- Cultivate a partnership with Landscape Conservation Cooperatives (LCCs) to bring additional partners together to identify shared priorities and identify landscape-level actions.
- Familiarize yourself with state Forest Action Plans; contact the state forester to coordinate updates, identify common priorities, and find other ways to coordinate the two plans.
- Coordinate with the US Department of Defense (DoD) Legacy Resource Management Program through the Integrated Natural Resource Management Plans (INRMPs)
- Work with neighboring state fish and wildlife agencies. Reach out to agencies with similar SGCN and habitats to pool resources for regional conservation efforts including problem identification, funding, mapping, and tracking the effectiveness of conservation actions.
- Evaluate the state Teaming With Wildlife (TWW) Coalition. The size and vitality of coalitions vary depending on the urgency of funding needs, or the availability of opportunities. Work with a partner organization to maintain contact with coalition members. Assess whether your coalition is meeting your needs and evaluate options for revitalizing your coalition if needed.
- Develop a communications plan. Identify key constituent groups and audiences, and involvement goals appropriate to each audience. Define communication strategies that will be effective at getting information to, and gathering feedback from, affected groups. Strategies can include outreach through print and electronic media, direct consultation through meetings and events, and quantitative public opinion data collection and human dimensions research. Host a SWAP Summit with identified stakeholders if goals include reinvigorating partnerships, sharing information, soliciting input, sharing successes, and/or garnering support.
- Engage partners in SWAP communications. Ask conservation partners to promote conservation projects, progress, and successes through their constituencies and outreach mechanisms (e.g., Web sites, social media, e-blasts).
- Use a team approach (with species and habitat biologists as well as GIS experts) to develop models and maps. Solicit and consider as much external review as possible along the way. This will ensure a better technical product and generate buy-in to encourage greater acceptance and use of the product.

Element 8: Public Participation

Broad public participation is an essential element of developing and implementing State Wildlife Action Plans, the conservation projects, and identifying the species in greatest need of conservation

- Notify the public of the state's intent to revise its SWAP early in the revision process. Ensure that the general public has an opportunity to review and comment on the plan before it is submitted. Give 30–60 days for the public comment period.
- Develop and implement a public participation process that (1) identifies key constituent groups/ audiences, (2) identifies involvement goals appropriate to each audience, and (3) defines involvement strategies that will be effective at getting information to, and gathering feedback from, affected groups. Make a deliberate effort to reach out to stakeholders and involve them in the process above and beyond formal agency public review processes. These strategies can include outreach through print and electronic media, direct consultation through meetings and events, and quantitative public opinion data collection/human dimensions research.
- Document within the SWAP both the process used and the consideration of comments received.
- File and archive all comments received, as well as actions taken with regard to each comment.
- Scale the level of public participation and comment solicitation with the type of review or revision (i.e., comprehensive, major, or minor) to make effective use of state agency resources.
- When reaching out to the public, link the plan to established community values (e.g., birdwatching, fishing, economic development, land protection, water quality, agriculture, quality of life). Acknowledge existing conservation efforts and emphasize the voluntary nature of the plan. Use direct and honest language. Effective public engagement galvanizes support for the SWAP and brings partners and funding to implementation.

Tennessee State Wildlife Action Plan 2015

Appendix B - Summary of major comments by conservation partners and public reviewers and responses to comments

Appendix B: Summary of major comments by conservation partners and public reviewers and responses to comments.

Conservation Partner Reviews, March and April 2015

Two separate meetings were held in March and April, 2015, in order to solicit feedback from a wide variety of government agency and NGO conservation partners. At each meeting, participants were led through guided work sessions with the following topics and questions.

Work Session 1: Review of draft Conservation Opportunity Areas (COAs). Please refer to the draft conservation area maps when answering these questions.

1. Do you feel that these draft COAs provide a framework that can help groups work together on common areas and objectives?
2. Do any boundaries need adjusting? Is anything big missing?
3. Can you help us identify a specific project location within one or more COAs where we can immediately work together?

Work Session 2: Collaborative strategies discussion, by theme (Agriculture, Watersheds, Private lands protection, Species/population restoration, Outreach & Education). Please refer to document provided with General & Specific Actions in addressing these questions.

1. What types of general strategies can we work on together that are relevant both for your organizational mission and habitat conservation?
2. How can TWRA work with your organization specifically on projects? (e.g. – data sharing, on-the-ground priority projects, outreach, etc.)

General responses to COA and strategy work session comments

Information provided by conservation partners in Work Session #1, question 3 and Work Session #2, question 2, have been incorporated into the individual Conservation Opportunity Area summaries as appropriate (see Appendix I). The notes shared regarding collaborations on general strategies (Work Session 2, question 1) have been compiled by TWRA staff in a format to be used as an internal resource for advancing partnerships on specific strategies and/or in specific geographies.

Review of Work Session #1, question 1 and 2 comments
The following is a summary of the major themes from the Work Session 1 dialogue on the design and utility of Conservation Opportunity Areas in Tennessee:

- Consensus expressed that COAs are a useful framework, both for setting priorities and identifying potential geographic collaborations
- Concerns regarding the size and extent of the COAs across the state, and a need for further definition of outcomes and prioritization within COAs
- The need to be clear on the definition process for COAs, the relative flexibility of the boundaries, and options for adjusting boundaries
- Importance of private lands and working with private landowners to achieve conservation goals statewide
- Recommendation for assessing future strategic opportunities which will cross more than one COA geography (e.g. – private forest lands initiative)

These themes were specifically addressed in the SWAP, Chapter 5 sections 5.2.2 and 5.2.1.

Post- Conservation Partner meeting comments submitted by Peggy W. Shute, Deputy Field Supervisor,
on behalf of the USFWS-TN Field Office, with responses

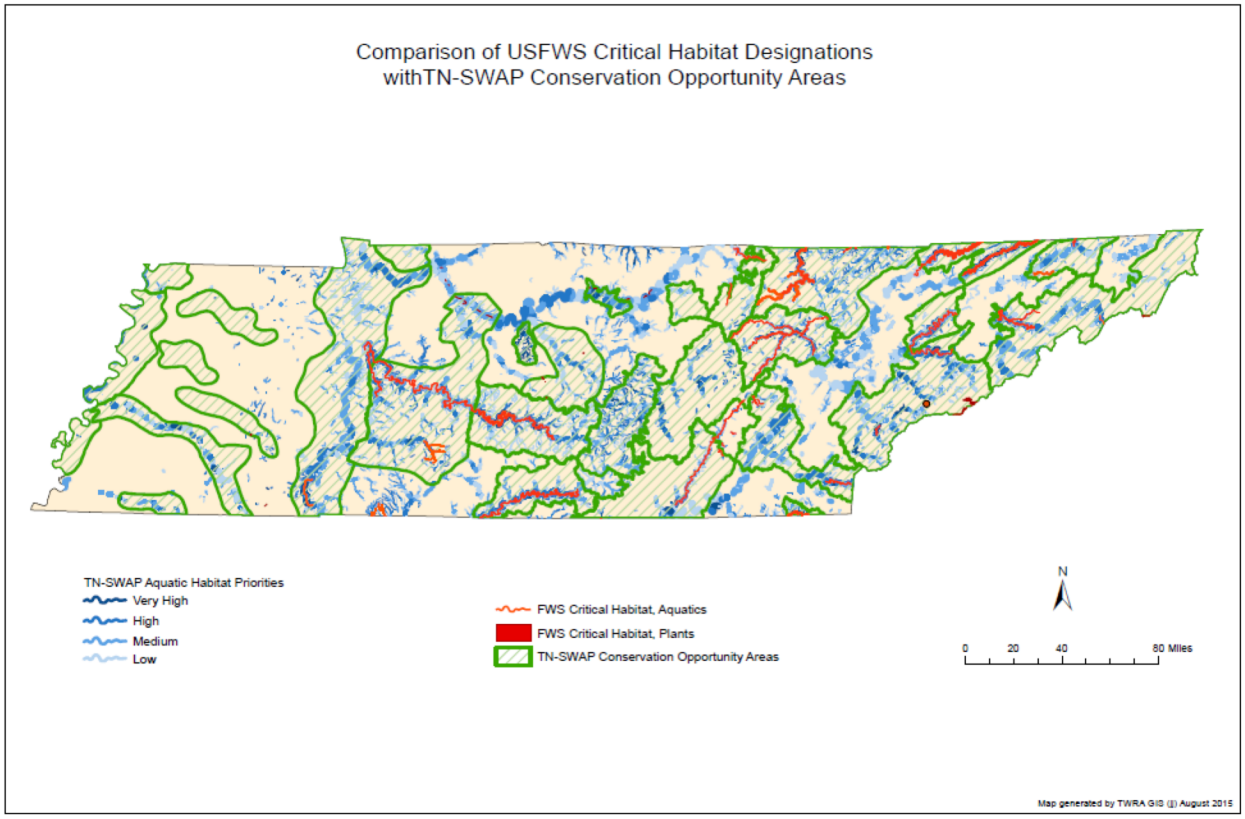
Comment: We appreciate that this version of the TN-SWAP includes plants and mollusk host species.
TWRA Response: Thank you. The explanation for these inclusions in the update is found in Chapter 3, section 3.1.

Comment: We recommend the dataset used for mine impacts (the dataset used is 2010 per the TN-SWAP update outline) be updated to incorporate new mining actions that have affected the landscape and watersheds since 2010.
TWRA Response: The dataset used for mine impacts has been updated and is current as of October 2014. In addition, Chapter 5, section 5.3.3 references the USFWS Appalachian LCC energy forecast model as an additional planning resource which may be utilized.

Comment: Is critical habitat designation included with the GIS modeling as additional

coverage? Some critical habitat designations are presently considered "unoccupied" by the species for which they're designated because these areas are considered important for the species' recovery efforts. Perhaps these areas should receive additional consideration in ranking priorities for conservation actions

TWRA Response: No, critical habitat designation areas have not been included as part of the habitat prioritization process, which is based on the observation records. However, we can review the critical habitat designation boundaries for Tennessee and see that they are considered within the identified Conservation Opportunity Areas. We worked with Kurt Snider to get the USFWS critical habitat designation information for comparison with the COAs. Please see the map on the following page. The majority of FWS Critical Habitat Designations are captured within COAs. Those few areas which are exceptions are in no way disadvantaged in terms of potential investments or collaborative efforts, and COA boundaries will be revisited in the future with partners as implementation of the 2015 SWAP proceeds.



Comments regarding federal status for species included in SWAP analyses (from the spreadsheet list of taxa included in the revision):

Northern long-eared bat (northern myotis), *Myotis septentrionalis*, is now listed federally threatened, which is not indicated on the spreadsheet.

Georgia pigtoe, *Pleurobema hanleyianum*, is listed federally endangered (with critical habitat designated). The spreadsheet indicates the federal status as "proposed endangered."

Slabside pearlymussel, *Pleuronaia dolabelloides*, is listed federally endangered (with critical habitat designated). The spreadsheet indicates this species as a federal candidate.

Fluted kidneyshell, *Ptychobranchus subtentum*, is listed federally endangered (with critical habitat designated). The spreadsheet indicates this species as a federal candidate.

Rabbitsfoot, *Quadrula cylindrica cylindrica*, is listed as federally threatened (with critical habitat designated). No federal status is indicated in the spreadsheet.

Ashy darter, *Etheostoma cinereum*, has recently been taxonomically split and both taxa are found in TN. The ashy darter as now described, is known only from the Tennessee River drainage, and the other taxon is redlips darter, *Etheostoma maydeni*, is the taxon in the Cumberland River drainage. Since the more widespread taxon (before the taxonomic split) was considered a GCN species prior to the split, probably both taxa resulting from the split should be included, and the rankings previously used might change some modeling results?
TWRA response to species status comments: All federal ranking status information has been changed in the database & the species list Appendix. For the ashy darter, the records assigned to the Cumberland and Tennessee drainages will be split accordingly, and those records from the Cumberland drainage re-assigned taxonomically as redlips darter, *Etheostoma maydeni*. This change will be made in the database prior to the final submission to the USFWS.

Comment: Emily Granstaff (presently a Tennessee Tech student working in our office for SARP as a FWS employee) responded to Question 3 regarding specific project locations within one or more COAs on which we could immediately work together, that she could overlay the SWAP Aquatic Habitat priorities with FWS critical habitat areas or at-risk species distributions to see if any reasonable dam removal projects are indicated. Emily's graduate project involves development of a tool to assist in prioritizing potential dam removal projects in relation to conservation impact.
TWRA Response: The Granstaff et al. (2015) project has been identified in Chapter 4, section 4.2 as an example of additional data in development by partners which can be used in the near future to assist in project identification and prioritization. Emily also sent updated numbers on the overall numbers of dams that have been incorporated into Chapter 4.

General strategies that FWS and the SWAP team could work on include:
FWS & SWAP GIS staffs collaborating to improve aquatic habitat data for future SWAP models (conservation planning theme)
TWRA Response: GIS collaboration opportunities noted in sections 4.2, 5.3, and 7.2

Restoration of habitats for federally-listed (T&E) species through the FWS' Recovery and Partners for Fish & Wildlife programs and actions to address at-risk species that could result in precluding the need to list some species under the ESA (habitat restoration theme)

TWRA Response: This information has been added to the introduction portion of section 5.3.3.

Enhancing GIS data state-wide (monitoring theme)
TWRA Response: Noted in Chapter 7

Ways in which TWRA and FWS can work together specifically on projects include:
FWS can share fish barrier data (Emily Granstaff).
TWRA Response: Noted in sections 4.2, 5.3

TWRA can assist FWS in identifying a site near the Hatchie River for water temperature monitoring in support of an alligator gar project (Emily Granstaff).
TWRA Response: USFWS added as a partner in the Hatchie COA (See Conservation Opportunity Area appendices).

Comment: In general, the COAs selected align well with priorities of our office. While we appreciate the educational opportunities for the selection of Mill Creek, which contains the federally listed crayfish, in the list of COAs, we also question this selection, since most COAs selected contain more than a single species of GCN or state or federal listing status.
TWRA Response: Please see the updated information on Mill Creek in the Conservation Opportunity Area appendix. Mill Creek watershed also provides habitat for a suite of other GCN species, including many plants and birds, as well as redband darter (*Etheostoma luteovinctum*). We hope this clarifies the addition of Mill Creek as a COA for the middle TN region.

Comments submitted during public review phase (8/10/15-9/4/15) & responses

Commenters: David Lincicome, Roger McCoy, David Withers, and Todd Crabtree – Tennessee Department of Environment and Conservation, Division of Natural Areas and Division of Natural Heritage
Dates: 8/14/15, 8/26/15, and 9/4/15

Comment & response summary: TDEC commenters provided a variety of input including: basic editorial comments; photo and caption recommendations; plant species name and conservation rank changes; and requests for additional content and/or clarification of content. TWRA has incorporated the vast majority of these edits and has communicated back to TDEC staff regarding how their comments were managed.

Commenter: Don Barger, National Parks Conservation Association
dbarger@npca.org
Date: 8/27/2015

Comments: Thank you for the opportunity to comment on the State's Draft Tennessee State Wildlife Action Plan 2015. The draft is well-written and well-organized. Also, the inclusion of resiliency planning in relation to likely effects of climate change is an important addition.

Specific Comments
Section 4.3.5 Energy Development
Non-renewable energy development: Coal mining

The State of Tennessee's Lands Unsuitable (LUM) Petition, filed pursuant to the Specific Action recommendation in the 2005 SWAP* (reaffirmed by the planning team on page 106) should be cited as an example of the State's plan to protect connectivity and minimize the impacts of fragmentation from non-renewable energy development. Since the federal Office of Surface Mining has yet to make a decision on the proposed designation, the 2015 SWAP should reiterate the multiple benefits of protecting ridgelines in the North Cumberland Wildlife Management Area (WMA). Because the petitioned area includes ridgelines that descend to and connect with the WMA's riparian zones, their protection as intact habitat would greatly enhance climate resiliency due to the range in elevations, insure important forested protection for headwater areas, provide biological restoration for areas downstream that are disturbed by mining, and help protect federally endangered aquatic species downstream in and above Big South Fork NRRA.

Accordingly, it would likewise seem appropriate to include the North Cumberland LUM Petition as an example in Section 5.3.5 Law and Policy: Policies and Regulations. The Petition is a good example of the kind of advanced planning in the high priority North Cumberland Plateau and Mountains COA that seeks a "focused collaboration (to) improve outcomes for GCN species and habitats."

Again, I appreciate this opportunity to comment.

* Law & Policy
Policies & Regulations
Encourage the federal Office of Surface Mining to designate critical units of aquatic, subterranean, and terrestrial habitats as "lands unsuitable for mining" under current federal policy guidelines.

TWRA response to comments by D. Barger, NPCA: In completing the final submission document, TWRA has incorporated more information regarding the Lands Unsuitable for Mining petition area and species potentially affected. These additions can been seen in Chapter 4, section 4.3.5 and Chapter 5, 5.3.3.

Commenter: Jessica Sanford, Stewart Co Humane Society & Cats are Us, Clarksville
Date: 8/27/2015

Comments:
Walden's puddle provides invaluable service to save wild life. I found out the hard way that my veterinary will not help with wildlife injuries and I understand that. Without Walden's puddle there would be no help for the injured animals.

TWRA response to comments by J. Sanford: Comments noted**.** A representative from Walden's Puddle participated in the non-governmental organization partnership meeting held on 4/9/15.

Commenter: Frosty Levy, East Tennessee State University
levyf@etsu.edu
Date: 9/1/2015

Comments: Several plant species of particular concern are not included on the list. These include:

Liatris virgata and *Lycopodiella inundata*, both from the Doe Mountain Recreation Area. Both are new to the state and their location in close proximity to ATV trails merits special attention.

Aureolaria pedicularia, re-discovered in the state after nearly 100 years since the original record. Now found in a large population on Rich Mountain (Unicoi Co.), and in small populations at Tellico Branch (Washington Co.) and Little Mountain (Unicoi Co.).

Pachera paupercula var. appalachica, a taxon with strong research showing its validity but whose results were inexplicably ignored by the Flora of North America. Common in the unique barrens habitat of the Elizabethton Watershed (Carter Co.).

Rudbeckia triloba var. pinnatiloba, also undoubtedly a valid taxon based on genetics and ecology. Common also in the Elizabethon Watershed barrens.

TWRA Response to comments by F. Levy: TWRA forwarded these recommendations to TDEC Division of Natural Heritage staff, who provided feedback on the inclusion of these species on the final 2015 GCN list. Based on this feedback, all plants recommended have been added to the GCN list, with the exception of *Packera paupercula* var. appalachia and *Aureolaria pedicularia*, which have no official conservation status at this time.

Commenter: Fred Ziegler
Date: 9/3/2015
Comments:
Swap maps do not show the correct river channel for the Burralo river at the I 40 bridge. See topo maps.
TWRA response to comments by F. Ziegler: Comments noted. The aquatic system maps are built from the flow-lines available in the National Hydrography Dataset Plus Version 2. This dataset does have discrepancies with respect to specific stream segments or flow lines from topographic maps.

Commenter: David Ray, Open Space Institute
dray@osi.org
Date: 9/4/2015

Comments: Thanks for the opportunity to comment.

The Open Space Institute (OSI) is pleased to see the inclusion of The Nature Conservancy's resilience analysis in the climate change sections of the draft plan, and the combination of that data with the other methodologies. We think it is critically important to include this cutting edge science and spatial data in the State's approach to responding to the effects of climate change on wildlife species and habitats. This approach will also dovetail with the criteria for OSI's Southeast Resilient Landscapes Fund, which provides conservation capital to land protection projects. (This refers to Maps 13 and 14, and pp. 98 and 101-104.)

For terrestrial priorities, the particularly high priority of the Southern Cumberland Plateau and the Northern Cumberland Plateau and Mountains, as well as parts of the Southern Blue Ridge, seems accurate and advisable.

We note and agree with the planning team's statement on page 106 in Chapter 5 that "[t]he 2015 planning team determined that the 2005 strategy hierarchy, including all the General and Specific Actions, remains applicable to GCN statewide conservation efforts moving forward (Appendix G)." OSI will continue to partner with state agencies and nonprofits on the "Habitat Acquisition" class of actions through our land protection funds, but it will be important to continue to build other sources of funds for those purposes in order to leverage the funds that we can make available. And as pressures for energy development continue to grow, it will be critically important to maintain and focus on the relevant specific actions listed in Appendix G—"Participate in environmental review procedures to prevent/mitigate coal mining and oil & natural gas drilling activities that affect target species in critical units of aquatic, subterranean, and terrestrial habitats"; and "Develop strategic alliance with TN Division of Geology, Office of Surface Mining, U.S. Geological Survey, TN Oil & Gas Association, private companies, and other institutions to address mining and drilling issues that affect target species and habitats."

TWRA response to comments by D. Ray, OSI: Comments noted. In completing the final submission document, TWRA has incorporated more information regarding the importance of collaborative efforts to avoid and mitigate affects from energy development. These additions can been seen in Chapter 4, section 4.3.5 and Chapter 5, sections 5.3.3 and 5.3.5. In addition, the specific strategy & collaboration recommendations made separately by OSI during the 4/9/15 partnership meeting have been captured within TWRA's internal partnership resource document.

Tennessee State Wildlife Action Plan 2015

Appendix C - Revised 2015 GCN species list, including additions and removals since 2005; separate list of GCN bird species in taxonomic order; and GCN wildlife and plant species closely associated with ridgeline areas in the North Cumberland Wildlife Management Area and Lands Unsuitable for Mining Petition boundary

Appendix C: Revised 2015 GCN species list, including additions and removals since 2005, and list of GCN bird species in taxonomic order

The following information is a summary of the rationale for selection and non-selection of GCN species. These criteria are the same as those designed and used in Tennessee's 2005 SWAP. The majority of species selected for GCN status met rationale criteria 1, or criteria 2 when ranking, or status information were uncertain or unavailable. Some of the more widespread bird species qualified as GCNs according to criteria 3.

Rationale Categories for Selection as GCN Species

1. Globally rare, imperiled, or endangered species (G1-G3 NatureServe rank) or federal status category of LE (Listed Endangered), E/SA (Endangered by Similarity of Appearance), LT (Listed Threatened), T/SA (Threatened by Similarity of Appearance, PE (Proposed Endangered), PT (Proposed Threatened), or C (Candidate species); or state status category of E (Endangered), T (Threatened), or D (Deemed In Need of Management).
2. Special concern species due to declining trends, or otherwise vulnerable due to endemic, limited, disjunct, or peripheral status in region.
3. Special consideration wide-ranging species due to:
    a. Partners in Flight (PIF) score of 22 or higher
    b. National Shorebird Prioritization Score of 4 or higher
    c. National Wind Coordinating Collaborative category of 'High'
    d. Being a "keystone" species within a biodiversity "hotspot" or part of a globally significant aggregation of species
    e. Species is strongly dependent upon ecological processes often interrupted across the landscape.

Rationale Categories for Non-selection as GCN Species

1. Species occurs in the state but is not significantly imperiled, endangered, declining, or of special management concern.
2. Species range and/or habitat does not sufficiently occur in state to warrant target status.
3. Species is of uncertain taxonomic status.
4. Species is believed to be extinct range-wide.
5. Actively managed game species with sufficient number of viable populations in state.
6. Species is of historic significance but cannot currently be restored in the state.
7. Species distribution in habitats in state is either unknown or too uncertain to warrant target status.

Table 1: 2015 Tennessee State Wildlife Action Plan Species of Greatest Conservation Need

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal	State Status	SWAP Tier
Amphibian	Acris gryllus	Southern Cricket Frog	G5	S2S3			1
Amphibian	Ambystoma barbouri	Streamside Salamander	G4	S2		D	1
Amphibian	Ambystoma texanum	Smallmouth Salamander	G5	S5			1
Amphibian	Aneides aeneus	Green Salamander	G3G4	S3S4			1
Amphibian	Cryptobranchus alleganiensis	Hellbender	G3G4	S3	No Status	D	1
Amphibian	Desmognathus abditus	Cumberland Dusky Salamander	G2G3	S2S3			1
Amphibian	Desmognathus aeneus	Seepage Salamander	G3G4	S1		D	1
Amphibian	Desmognathus imitator	Imitator Salamander	G3G4	S3			1
Amphibian	Desmognathus organi	Northern Pygmy Salamander	G3	SNR			1
Amphibian	Desmognathus welteri	Black Mountain Salamander	G4	S3		D	1
Amphibian	Desmognathus wrighti	Pygmy Salamander	G3	S2S3		D	1
Amphibian	Eurycea aquatica	Brown-backed Salamander	G3	SNR			1
Amphibian	Eurycea junaluska	Junaluska Salamander	G3	S2		D	1
Amphibian	Gyrinophilus gulolineatus	Berry Cave Salamander	G1Q	S1		T	1
Amphibian	Gyrinophilus palleucus	Tennessee Cave Salamander	G2G3	S2		T	1
Amphibian	Gyrinophilus palleucus necturoides	Big Mouth Cave Salamander	G2G3T1	SNR			1
Amphibian	Gyrinophilus palleucus palleucus	Pale Salamander	G2G3T2	S?			1
Amphibian	Hemidactylium scutatum	Four-toed Salamander	G5	S3		D	1
Amphibian	Hyla gratiosa	Barking Treefrog	G5	S3		D	1
Amphibian	Hyla versicolor	Gray Treefrog	G5	S5			1
Amphibian	Lithobates areolatus	Crawfish Frog	G4	S4			1
Amphibian	Necturus maculosus	Mudpuppy	G5	S5			1
Amphibian	Plethodon aureolus	Tellico Salamander	G2G3	S2			1
Amphibian	Plethodon jordani	Red-cheeked Salamander	G2	S2			1
Amphibian	Plethodon montanus	Northern Gray-cheeked Salamander	G4	S3			1
Amphibian	Plethodon richmondi	Ravine Salamander	G5	S2			1
Amphibian	Plethodon shermani	Red-legged Salamander	G2	S2			1
Amphibian	Plethodon wehrlei	Wehrle's Salamander	G4	S1		D	1
Amphibian	Plethodon welleri	Weller's Salamander	G3	S2		D	1
Amphibian	Plethodon yonahlossee	Yonahlossee Salamander	G4	S2			1
Amphibian	Pseudacris brachyphona	Mountain Chorus Frog	G5	S4			1
Amphibian	Pseudotriton montanus	Mud Salamander	G5	S5			1
Amphibian	Rana capito	Carolina Gopher Frog	G3	S1			1

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Amphibian	Siren intermedia	Lesser Siren	G5	S5			1
Arachnid	Achaearanea porteri	Porter's cave spider	G4	S?			2
Arachnid	Agyneta sp.	Trussell Cave Sheet-web Spider	G1	S?			2
Arachnid	Anthrobia mammouthia	(a cave obligate spider)	G5	S1			2
Arachnid	Antrodiaetus sp.	(a foldingdoor trap-door spider)	G?	S?			2
Arachnid	Apochthonius minor	(a pseudoscorpion)	G1	S?			2
Arachnid	Apochthonius sp.	(a pseudoscorpion)	G1	S?			2
Arachnid	Appaleptoneta sp.	(a cave leptonetid spider)	G1	S?			2
Arachnid	Appaleptoneta sp. 1	(a cave leptonetid spider)	G1	S1			2
Arachnid	Bathyphantes albiventris	(a sheet-web spider)	G4	S?			2
Arachnid	Bathyphantes pallidus	Pallid Sheet-web Spider	G5	S?			2
Arachnid	Bishopella sp. Probably laciniosa	harvestman	G?	S?			2
Arachnid	Callioplus pantoplus	(an amaurobiid spider)	G3	S2			2
Arachnid	Calymmaria persica	Cave-loving funnel-web spider	G4	S?			2
Arachnid	Chitrella archeri	(a cave obligate pseudoscorpion)	G1G2	S1S2			2
Arachnid	Cicurina breviaria	funnel-web spider	G4	S?			2
Arachnid	Cicurina placida	funnel-web spider	G4	S?			2
Arachnid	Coras taugynus	funnel-web spider	G3G4	S?			2
Arachnid	Eidmanella pallida	Pallid cave spider	G5	S?			2
Arachnid	Erebomaster sp.	harvestmen	G?	S?			2
Arachnid	Hesperochernes mirabilis	Southeastern Cave Pseudoscorpion	G5	S3			2
Arachnid	Hesperonemastoma sp.	harvestmen	G?	S?			2
Arachnid	Kleptochthonius affinis	(a cave obligate pseudoscorpion)	G1G2	S1S2			2
Arachnid	Kleptochthonius barri	(a cave obligate pseudoscorpion)	G1G2	S1S2			2
Arachnid	Kleptochthonius charon	(a cave obligate pseudoscorpion)	G1G2	S1S2			2
Arachnid	Kleptochthonius daemonius	(a cave obligate pseudoscorpion)	G1G2	S1S2			2
Arachnid	Kleptochthonius infernalis	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius magnus	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius myopius	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius pluto	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius rex	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius sp.	Sells cave pseudoscorpion	G1	S?			2
Arachnid	Kleptochthonius sp.	pseudoscorpions	G1	S?			2
Arachnid	Kleptochthonius sp.	Round Cove cave pseudoscorpion	G1	S?			2
Arachnid	Kleptochthonius sp.	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius stygius	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius tantalus	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Kleptochthonius undescribed sp.	cave pseudoscorpions	G1	S?			2

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Arachnid	Liocranoides archeri	Archer's two-clawed spider	G2	S?			2
Arachnid	Liocranoides coylei	Coyle's tengellid spider	G3	S?			2
Arachnid	Liocranoides gertschi	Gertsch's tengellid spider	G3	S?			2
Arachnid	Liocranoides sp.	(a cave two-clawed spider)	G1G2	S?			2
Arachnid	Liocranoides sp.	Two-clawed spider	G2	S?			2
Arachnid	Liocranoides tennesseensis	Tennessee two-clawed spider	G2	S?			2
Arachnid	Liocranoides unicolor	(a cave obligate spider)	G5	S?			2
Arachnid	Macrocheles sp. 1	mite	G?	S?			2
Arachnid	Macrocheles sp. 2	mite	G?	S?			2
Arachnid	Macrocheles sp. 3	mite	G?	S?			2
Arachnid	Maymena ambita	Minute cave spider	G3	S?			2
Arachnid	Meta ovalis	American cave orb weaver	G5	S?			2
Arachnid	Microcreagris nickajackensis	Nickajack cave pseudoscorpion	G1	S?			2
Arachnid	Microhexura montivaga	Spruce-fir Moss Spider	G1	S1	LE		2
Arachnid	Nemasatosoma sp.	harvestmen	G?	S?			2
Arachnid	Nesticus barri	(a cave obligate spider)	G3	S3			2
Arachnid	Nesticus barrowsi	(a cave obligate spider)	G1G2	S1S2			2
Arachnid	Nesticus dilutus	Grassy Creek Cave Spider	G1	S1			2
Arachnid	Nesticus furtivus	Crystal Caverns Cave Spider	G1	S1			2
Arachnid	Nesticus paynei	(a cave obligate spider)	G3G4	S3			2
Arachnid	Nesticus pecki	Peck's cave spider	G1	S?			2
Arachnid	Nesticus stygius	(a cave obligate spider)	G1G2	S1S2			2
Arachnid	Nesticus tennesseensis	(a spider)	G3G4	S2S4			2
Arachnid	Nesticus valentinei	Valentine's Cave Spider	G1G2	S1S2	MC		2
Arachnid	Oreonetides sp.	cave sheet-web spiders	G1	S?			2
Arachnid	Phalangodes appalachius	Appalachian Cave Harvestman	G3G4	S3			2
Arachnid	Phalangodes sp.	cave harvestmen	G2	S?			2
Arachnid	Phanetta subterranea	Subterranean sheet-web spider	G5	S?			2
Arachnid	Poecilophysis weyerensis	(a cave mite)	G3?	S2S3			2
Arachnid	Porrhomma cavernicola	Appalachian Cave Spider	G5	S1?			2
Arachnid	Rhagidia species s. latu	(a mite)	G?	S?			2
Arachnid	Theromaster sp. 1	(a cave obligate harvestman)	G1	S1			2
Arachnid	Tolus sp.	(a harvestman)	G?	S?			2
Arachnid	Tyrannochthonius fiskei	(a cave obligate pseudoscorpion)	G1	S1			2
Arachnid	Tyrannochthonius halopotamus	Salt River cave pseudoscorpion	G1	S?			2
Arachnid	Tyrannochthonius steevesi	(a cave obligate pseudoscorpion)	G1	S1			2
Bat	Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S3		D	1
Bat	Corynorhinus townsendii virginianus	Virginia Big-eared Bat	G4T2	SP	LE		3

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Bat	Myotis austroriparius	Southeastern Bat	G3G4	S3			1
Bat	Myotis grisescens	Gray Bat	G3	S2	LE	E	3
Bat	Myotis leibii	Eastern Small-footed Bat	G1G3	S2S3		D	1
Bat	Myotis lucifugus	Little Brown Bat	G5	S5			1
Bat	Myotis septentrionalis	Northern Myotis	G4	S4	LT		3
Bat	Myotis sodalis	Indiana Bat	G2	S1	LE	E	3
Bat	Perimyotis subflavus	Tri-colored Bat	G5	S5			1
Bird	Accipiter striatus	Sharp-shinned Hawk	G5	S3B, S4N	No Status	D	1
Bird	Aegolius acadicus	Northern Saw-whet Owl	G5	S1		T	1
Bird	Ammodramus henslowii	Henslow's Sparrow	G4	S1B		D	1
Bird	Ammodramus leconteii	LeConte's Sparrow	G4	S1N			1
Bird	Ammodramus savannarum	Grasshopper Sparrow	G5	S4	(PS)		1
Bird	Anas rubripes	American Black Duck	G5	S3S4N			1
Bird	Aquila chrysaetos	Golden Eagle	G5	S1		T	1
Bird	Ardea alba	Great Egret	G5	S2B, S3N		D	1
Bird	Asio flammeus	Short-eared Owl	G5	S3N			1
Bird	Bartramia longicauda	Upland Sandpiper	G5	SXB?			1
Bird	Bonasa umbellus	Ruffed Grouse	G5	S4			1
Bird	Botaurus lentiginosus	American Bittern	G4	S1			1
Bird	Calidris canutus	Red Knot	G5	S2N			1
Bird	Calidris himantopus	Stilt Sandpiper	G5	S3N			1
Bird	Calidris mauri	Western Sandpiper	G5	S4N			1
Bird	Calidris pusilla	Semipalmated Sandpiper	G5	S4N			1
Bird	Caprimulgus carolinensis	Chuck-will's-widow	G5	S3S4			1
Bird	Caprimulgus vociferus	Whip-poor-will	G5	S3S4			1
Bird	Cardellina canadensis	Canada Warbler	G5	S3B, S4N			1
Bird	Certhia americana	Brown Creeper	G5	S2B, S4N			1
Bird	Chaetura pelagica	Chimney Swift	G5	S5			1
Bird	Charadrius alexandrinus	Snowy Plover	G4	S?	(PS:LT)		3
Bird	Charadrius melodus melodus	Piping Plover	G3	S2N	(LE:LT)		3
Bird	Charadrius wilsonia	Wilson's Plover	G5	S?			1
Bird	Chordeiles minor	Common Nighthawk	G5	S4			1
Bird	Circus cyaneus	Northern Harrier	G5	S4N			1
Bird	Cistothorus platensis	Sedge Wren	G5	S3N, SPB			1
Bird	Colinus virginianus	Northern Bobwhite	G5	S2S3	(PS)		1
Bird	Contopus cooperi	Olive-sided Flycatcher	G4	S1		D	1
Bird	Egretta caerulea	Little Blue Heron	G5	S2B, S3N		D	1
Bird	Empidonax alnorum	Alder Flycatcher	G5	S1			1

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Bird	Empidonax minimus	Least Flycatcher	G5	S3			1
Bird	Empidonax traillii	Willow Flycatcher	G5	S2S3	(PS)		1
Bird	Euphagus carolinus	Rusty Blackbird	G5	S4N			1
Bird	Falco peregrinus	Peregrine Falcon	G4	S1B	No Status	E	3
Bird	Gallinula galeata	Common Gallinule	G5	S1B	No Status	D	1
Bird	Geothlypis formosa	Kentucky Warbler	G5	S4			1
Bird	Grus americana	Whooping Crane	G1	S?	(LE, XN)		3
Bird	Haliaeetus leucocephalus	Bald Eagle	G5	S3		D	3
Bird	Helmitheros vermivorum	Worm-eating Warbler	G5	S4			1
Bird	Hylocichla mustelina	Wood Thrush	G5	S4			1
Bird	Icteria virens	Yellow-breasted Chat	G5	S4			1
Bird	Icterus spurius	Orchard Oriole	G5	S4			1
Bird	Ictinia mississippiensis	Mississippi Kite	G5	S2S3		D	1
Bird	Ixobrychus exilis	Least Bittern	G5	S2B		D	1
Bird	Lanius ludovicianus	Loggerhead Shrike	G4	S1B, S2N	No Status	D	1
Bird	Limnothlypis swainsonii	Swainson's Warbler	G4	S3		D	1
Bird	Limosa fedoa	Marbled Godwit	G5	S?			1
Bird	Limosa haemastica	Hudsonian Godwit	G4	S?			1
Bird	Melanerpes erythrocephalus	Red-headed Woodpecker	G5	S4			1
Bird	Numenius phaeopus	Whimbrel	G5	S?			1
Bird	Nycticorax nycticorax	Black-crowned Night-heron	G5	S2S3B			1
Bird	Parkesia motacilla	Louisiana Waterthrush	G5	S4			1
Bird	Passerina ciris	Painted Bunting	G5	S2			1
Bird	Peucaea aestivalis	Bachman's Sparrow	G3	S1B		E	1
Bird	Pluvialis dominica	American Golden Plover	G5	S3N			1
Bird	Poecile atricapillus	Black-capped Chickadee	G5	S2B			1
Bird	Porphyrula martinica	Purple Gallinule	G5	S1B			1
Bird	Protonotaria citrea	Prothonotary Warbler	G5	S4			1
Bird	Rallus elegans	King Rail	G4	S2		D	1
Bird	Rallus limicola	Virginia Rail	G5	S1B, S3N			1
Bird	Riparia riparia	Bank Swallow	G5	S3			1
Bird	Setophaga caerulescens	Black-throated Blue Warbler	G5	S4			1
Bird	Setophaga cerulea	Cerulean Warbler	G4	S3B		D	1
Bird	Setophaga discolor	Prairie Warbler	G5	S3S4			1
Bird	Setophaga dominica	Yellow-throated Warbler	G5	S4			1
Bird	Setophaga fusca	Blackburnian Warbler	G5	S3B, S4N			1
Bird	Scolopax minor	American Woodcock	G5	S4B			3
Bird	Sitta pusilla	Brown-headed Nuthatch	G5	S2B			1

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Bird	Sphyrapicus varius	Yellow-bellied Sapsucker	G5	S1B, S4N		D	1
Bird	Sternula antillarum athalassos	Interior Least Tern	G4T2Q	S2S3B	LE	E	3
Bird	Sturnella magna	Eastern Meadowlark	G5	S5			1
Bird	Thryomanes bewickii	Bewick's Wren	G5	S1		E	1
Bird	Troglodytes troglodytes	Winter Wren	G5	S3B, S4N			1
Bird	Tryngites subruficollis	Buff-breasted Sandpiper	G4	S3N	MC		1
Bird	Tympanuchus cupido	Greater Prairie-chicken	G4	SX	(PS)		1
Bird	Tyto alba	Barn Owl	G5	S3		D	1
Bird	Vermivora chrysoptera	Golden-winged Warbler	G4	S3B		D	1
Bird	Vermivora cyanoptera	Blue-winged Warbler	G5	S4			1
Bird	Vireo bellii	Bell's Vireo	G5	S1B	No Status		1
Bivalve	Actinonaias ligamentina	Mucket	G5	S4			1
Bivalve	Actinonaias pectorosa	Pheasantshell	G4	S4			1
Bivalve	Alasmidonta atropurpurea	Cumberland Elktoe	G1G2	S1S2	LE	E	3
Bivalve	Alasmidonta marginata	Elktoe	G4	S4	MC		1
Bivalve	Alasmidonta raveneliana	Appalachian Elktoe	G1	S1	LE	E	3
Bivalve	Alasmidonta viridis	Slippershell Mussel	G4G5	S3S4			1
Bivalve	Anodontoides denigratus	Cumberland Papershell	G1	SSYN	MC		1
Bivalve	Cumberlandia monodonta	Spectaclecase	G3	S2S3	LE		3
Bivalve	Cyprogenia stegaria	Fanshell	G1Q	S1	LE	E	3
Bivalve	Dromus dromas	Dromedary Pearlymussel	G1	S1	LE	E	3
Bivalve	Elliptio arca	Alabama Spike	G3Q	S2			1
Bivalve	Elliptio arctata	Delicate Spike	G2G3Q	S2			1
Bivalve	Epioblasma brevidens	Cumberlandian Combshell	G1	S1	LE	E	3
Bivalve	Epioblasma capsaeformis	Oyster Mussel	G1	S1	LE	E	3
Bivalve	Epioblasma florentina walkeri	Tan Riffleshell	G1T1	S1	LE	E	3
Bivalve	Epioblasma metastriata	Upland Combshell	GH	SH	LE	E	3
Bivalve	Epioblasma obliquata obliquata	Catspaw	G1T1	S1	LE	E	3
Bivalve	Epioblasma othcaloogensis	Southern Acornshell	GHQ	SH	LE	E	3
Bivalve	Epioblasma triquetra	Snuffbox	G3	S3	LE		3
Bivalve	Fusconaia cor	Shiny Pigtoe	G1	S1	LE	E	3
Bivalve	Fusconaia cuneolus	Finerayed Pigtoe	G1	S1	LE	E	3
Bivalve	Fusconaia subrotunda	Longsolid	G3	S3			1
Bivalve	Hamiota altilis	Finelined Pocketbook	G2G3	S1S2	LT	T	3
Bivalve	Hemistena lata	Cracking Pearlymussel	G1	S1	LE	E	3
Bivalve	Lampsilis abrupta	Pink Mucket	G2	S2	LE	E	3
Bivalve	Lampsilis siliquoidea	Fatmucket	G5	S2			1
Bivalve	Lampsilis straminea claibornensis	Southern Fatmucket	G5T5	SH			1

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Bivalve	Lampsilis virescens	Alabama Lampmussel	G1	S1	LE	E	3
Bivalve	Lasmigona complanata complanata	White Heelsplitter	G5T5	S?			1
Bivalve	Lasmigona holstonia	Tennessee Heelsplitter	G3	S2			1
Bivalve	Lasmigona sp. 1 cf. holstonia	Barrens Bankclimber	GNR	S1			1
Bivalve	Lasmigona subviridis	Green Floater	G3	S2			1
Bivalve	Lemiox rimosus	Birdwing Pearlymussel	G1	S1	LE	E	3
Bivalve	Leptodea leptodon	Scaleshell	G1	SX	LE		3
Bivalve	Ligumia recta	Black Sandshell	G5	S5			1
Bivalve	Medionidus acutissimus	Alabama Moccasinshell	G2	S1	LT	T	3
Bivalve	Medionidus conradicus	Cumberland Moccasinshell	G3G4	S3			1
Bivalve	Medionidus parvulus	Coosa Moccasinshell	G1Q	S1	LE	E	3
Bivalve	Obovaria jacksoniana	Southern Hickorynut	G2	S1			1
Bivalve	Obovaria olivaria	Hickorynut	G4	S2?			1
Bivalve	Obovaria retusa	Ring Pink	G1	S1	LE	E	3
Bivalve	Obovaria subrotunda	Round Hickorynut	G4	S2S3			1
Bivalve	Pegias fabula	Littlewing Pearlymussel	G1	S1	LE	E	3
Bivalve	Plethobasus cicatricosus	White Wartyback	G1	S1	LE	E	3
Bivalve	Plethobasus cooperianus	Orangefoot Pimpleback	G1	S1	LE	E	3
Bivalve	Plethobasus cyphyus	Sheepnose	G3	S2S3	LE		3
Bivalve	Pleurobema chattanoogaense	Painted Clubshell	G1Q	S1?			1
Bivalve	Pleurobema clava	Clubshell	G1G2	SH	LE	E	3
Bivalve	Pleurobema cordatum	Ohio Pigtoe	G3	S3			1
Bivalve	Pleurobema decisum	Southern Clubshell	G1G2	S1	LE	E	3
Bivalve	Pleurobema georgianum	Southern Pigtoe	G1	S1	LE	E	3
Bivalve	Pleurobema gibberum	Cumberland Pigtoe	G1	S1	LE	E	3
Bivalve	Pleurobema hanleyianum	Georgia Pigtoe	G1	S1	LE		3
Bivalve	Pleurobema johannis	Alabama Pigtoe	GH	S1?			1
Bivalve	Pleurobema oviforme	Tennessee Clubshell	G2G3	S2S3			1
Bivalve	Pleurobema perovatum	Ovate Clubshell	G1	SH	LE	E	3
Bivalve	Pleurobema plenum	Rough Pigtoe	G1	S1	LE	E	3
Bivalve	Pleurobema rubellum	Warrior Pigtoe	GH	SH			1
Bivalve	Pleurobema rubrum	Pyramid Pigtoe	G2G3	S1S2			1
Bivalve	Pleurobema sintoxia	Round Pigtoe	G4	S4			1
Bivalve	Pleurobema troschelianum	Alabama Clubshell	G1Q	S1			1
Bivalve	Pleuronaia barnesiana	Tennessee Pigtoe	G2G3	S2S3			1
Bivalve	Pleuronaia dolabelloides	Slabside Pearlymussel	G2	S2	LE		3
Bivalve	Ptychobranchus foremanianus	Rayed Kidneyshell	G1	S1	LE	E	3
Bivalve	Ptychobranchus subtentum	Fluted Kidneyshell	G2	S2	LE		3

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Bivalve	Quadrula cylindrica cylindrica	Rabbitsfoot	G3G4T3	S3	LT		3
Bivalve	Quadrula cylindrica strigillata	Rough Rabbitsfoot	G3G4T2	S2	LE	E	3
Bivalve	Quadrula fragosa	Winged Mapleleaf	G1	S1	LE	E	3
Bivalve	Quadrula intermedia	Cumberland Monkeyface	G1	S1	LE	E	3
Bivalve	Quadrula sparsa	Appalachian Monkeyface	G1	S1	LE	E	3
Bivalve	Simpsonaias ambigua	Salamander Mussel	G3	S1			1
Bivalve	Strophitus connasaugaensis	Alabama Creekmussel	G3	S1			1
Bivalve	Strophitus undulatus	Creeper	G5	S5			1
Bivalve	Toxolasma cylindrellus	Pale Lilliput	G1	S1	LE	E	3
Bivalve	Toxolasma lividum	Purple Lilliput	G3Q	S1S2			1
Bivalve	Uniomerus declivis	Tapered Pondhorn	G5Q	S2			1
Bivalve	Venustaconcha sima	(a mussel)	G?	S?			1
Bivalve	Villosa fabalis	Rayed Bean	G2	S1	LE		3
Bivalve	Villosa iris	Rainbow	G5	S5			1
Bivalve	Villosa lienosa	Little Spectaclecase	G5	S4S5			1
Bivalve	Villosa nebulosa	Alabama Rainbow	G3	S2			1
Bivalve	Villosa perpurpurea	Purple Bean	G1	S1	LE	E	3
Bivalve	Villosa taeniata	Painted Creekshell	G3G4	S3S4			1
Bivalve	Villosa trabalis	Cumberland Bean	G1	S1	LE	E	3
Bivalve	Villosa umbrans	Coosa Creekshell	G2	S2			1
Bivalve	Villosa vanuxemensis	Mountain Creekshell	G4	S4			1
Bivalve	Villosa vibex	Southern Rainbow	G5Q	S2			1
Crustacean	Acanthocyclops parasensitivus	(a copepod)	G2	S?			1
Crustacean	Amerigoniscus nicholasi	(a cave obligate isopod)	G1G2	S1S2			1
Crustacean	Amerigoniscus paynei	(a cave obligate isopod)	G1G2	S2S3			1
Crustacean	Bactrurus angulus	Cumberland Gap Cave Amphipod	G1	S1			1
Crustacean	Bactrurus undescribed sp.	groundwater amphipod	G1	S?			1
Crustacean	Barbicambarus cornutus	Bottle Brush Crayfish	G4	S2			1
Crustacean	Bryocamptus (Limocamptus) sp.	copepods	G1	S?			1
Crustacean	Caecidotea bicrenata	(a cave obligate isopod)	G5	SR			1
Crustacean	Caecidotea bicrenata bicrenata	(a cave obligate isopod)	G3G4T3T4	SR			1
Crustacean	Caecidotea bicrenata whitei	(a cave obligate isopod)	G3G4T3T4	S1?			1
Crustacean	Caecidotea circulus	(a cave obligate isopod)	G1G2	S1			1
Crustacean	Caecidotea incurva	Incurved Cave Isopod	G2G4	S1			1
Crustacean	Caecidotea nickajackensis	Nickajack Cave Isopod	GH	S1			1
Crustacean	Caecidotea nortoni	(a cave obligate isopod)	G2G3	S1S2			1
Crustacean	Caecidotea recurvata	Southwestern Virginia Cave Isopod	G5	SR			1
Crustacean	Caecidotea richardsonae	Tennessee Valley Cave Isopod	G3G5	SR			1

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Crustacean	Caecidotea scyphus	(a cave obligate isopod)	G1G2	S1			1
Crustacean	Caecidotea sp.	cave isopods	G?	S?			1
Crustacean	Caecidotea stygia	(a cave obligate isopod)	G5	S1S2			1
Crustacean	Cambarus angularis	Angled Crayfish	G3	S3?			1
Crustacean	Cambarus bouchardi	Big South Fork Crayfish	G2	S1		E	1
Crustacean	Cambarus brachydactylus	Shortfingered Crayfish	G2G4	S3			1
Crustacean	Cambarus clivosus	Short Mountain Crayfish	G2	S2			1
Crustacean	Cambarus conasaugaensis	Mountain Crayfish	G3	S1			1
Crustacean	Cambarus crinipes	Hairyfoot Crayfish	G3	S3			1
Crustacean	Cambarus cymatilis	Conasauga Blue Burrower	G1	S1		E	1
Crustacean	Cambarus deweesae	Valley Flame Crayfish	G4	S1		E	1
Crustacean	Cambarus extraneus	Chickamauga Crayfish	G2	S1S2		T	1
Crustacean	Cambarus hamulatus	Prickly Cave Crayfish	G3G4	S3			1
Crustacean	Cambarus hiwasseensis	Hiwassee Crayfish	G3G4	S1			1
Crustacean	Cambarus manningi	(a crayfish)	G4	S3			1
Crustacean	Cambarus obeyensis	Obey Crayfish	G1	S2		T	1
Crustacean	Cambarus pristinus	Pristine Crayfish	G2	S2		E	1
Crustacean	Cambarus sp. 1	Emory River Crayfish	G1	S1			1
Crustacean	Cambarus sp?	Obed Crayfish	G1Q	S1?			1
Crustacean	Cambarus stockeri	Cocoa Crayfish	GNR	S1S2			1
Crustacean	Cambarus tenebrosus	Cavespring Crayfish	G4	S?			1
Crustacean	Cambarus williami	Brawleys Fork Crayfish	G2	S2		E	1
Crustacean	Crangonyx antennatus	Appalachian cave amphipod	G4	S?			1
Crustacean	Crangonyx sp.	amphipods	G?	S?			1
Crustacean	Dactylocythere steevesi	(a cave obligate shrimp)	G4	S2S3			1
Crustacean	Diacyclops nearticus	Nearctic copepod	G3G4	S?			1
Crustacean	Diacyclops sp.	Indiana Groundwater Copepod	G1	S1			1
Crustacean	Diacyclops yeatmani	Yeatman's Groundwater Copepod	G2G3	S1			1
Crustacean	Donnaldsoncythere tuberosa	(a cave obligate shrimp)	G2G3	S2?			1
Crustacean	Fallicambarus hortoni	Hatchie Burrowing Crayfish	G1	S1		E	1
Crustacean	Gammarus minus	Lesser spring amphipod	G5	S?			1
Crustacean	Haplophthalmus danicus	(a terrestrial cave isopod)	G?	S?			1
Crustacean	Itocyclops undescribed sp.	cave copepods	G1	S?			1
Crustacean	Ligidium elrodii hancockensis	(a cave obligate isopod)	G4G5T1T2	S1?			1
Crustacean	Megacyclops donnaldsoni	Donnaldson’s cave copepod	G1	S?			1
Crustacean	Miktoniscus barri	(a cave obligate isopod)	G2G4	S2?			1
Crustacean	Miktoniscus medcofi	Medcof’s terrestrial isopod	G4	S?			1
Crustacean	Orconectes alabamensis	Alabama Crayfish	G5	S2		D	1

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Crustacean	Orconectes australis	Southern Cave Crayfish	G5	S3			1
Crustacean	Orconectes barrenensis	(a crayfish)	G4	S3			1
Crustacean	Orconectes barri	Cumberland Plateau Cave Crayfish	G2	S?			1
Crustacean	Orconectes burri	Blood River Crayfish	G2	S1			1
Crustacean	Orconectes cooperi	Flint River Crayfish	G1	S1			1
Crustacean	Orconectes forceps	Surgeon Crayfish	G4	S4			1
Crustacean	Orconectes incomptus	Tennessee Cave Crayfish	G2	S1		E	1
Crustacean	Orconectes pagei	Big Sandy Crayfish	G4	S4			1
Crustacean	Orconectes pellucidus	Mammoth Cave Crayfish	G4	S3			1
Crustacean	Orconectes shoupi	Nashville Crayfish	G1G2	S1S2	LE	E	3
Crustacean	Orconectes taylori	Crescent Crayfish	G2	S2			1
Crustacean	Orconectes wrighti	Hardin Crayfish	G2	S2		E	1
Crustacean	Pseudocandona jeanneli	Jeannel's Cave Ostracod	G1G2	S?			1
Crustacean	Pseudocandona sp.	groundwater ostracods	G1G2	S?			1
Crustacean	Sagittocythere barri	Ectocommensal Ostracod	G5	S3			1
Crustacean	Stygobromus barryi	(a cave obligate amphipod)	G2G3	S1			1
Crustacean	Stygobromus dicksoni	(a cave obligate amphipod)	G5	S1S2			1
Crustacean	Stygobromus exilis	Central Kentucky Cave Obligate	G5	SR			1
Crustacean	Stygobromus fecundus	(a cave obligate amphipod)	G1G2	S1			1
Crustacean	Stygobromus finleyi	Finley's Cave Amphipod	G3G4	S1			1
Crustacean	Stygobromus mackini	Southwestern Virginia Cave Amphipod	G5	SR			1
Crustacean	Stygobromus nortoni	Norton's Cave Amphipod	G2G3	SH			1
Crustacean	Stygobromus sp.	cave amphipods	G?	S?			1
Crustacean	Stygobromus sp. 22	Swamp River Cave Amphipod	G3	S3			1
Crustacean	Stygobromus sp. 24	(a cave obligate amphipod)	G1	S1			1
Crustacean	Stygobromus sp. 3	Bosnak’s cave amphipod	G2	S?			1
Crustacean	Stygobromus sp. 34	(a cave obligate amphipod)	G1G2	S1S2			1
Crustacean	Stygobromus sp. 4	Southern cave amphipod	G3	S?			1
Crustacean	Stygobromus sparsus	(a cave obligate amphipod)	G4	S1			1
Crustacean	Stygobromus vitreus	(a cave obligate amphipod)	G4	S2			1
Crustacean	Triconiscus pusillus	terrestrial isopod	EX	S?			1
Fish	Acipenser fulvescens	Lake Sturgeon	G3G4	S1		E	1
Fish	Ammocrypta beanii	Naked Sand Darter	G5	S2		D	1
Fish	Ammocrypta clara	Western Sand Darter	G3	S1		T	1
Fish	Ammocrypta vivax	Scaly Sand Darter	G5	S2		D	1
Fish	Anguilla rostrata	American Eel	G5	S3			1
Fish	Atractosteus spatula	Alligator Gar	G3G4	S1		D	1
Fish	Carpiodes velifer	Highfin Carpsucker	G4G5	S2S3		D	1

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Fish	Chrosomus cumberlandensis	Blackside Dace	G2	S2	LT	T	3
Fish	Chrosomus saylori	Laurel Dace	G1	S1	LE	E	3
Fish	Chrosomus tennesseensis	Tennessee Dace	G3	S3		D	1
Fish	Clinostomus funduloides ssp. 1	Smoky Dace	G5T3Q	S1S2		D	1
Fish	Crystallaria cincotta	Diamond Darter	G1	SX		D	1
Fish	Cycleptus elongatus	Blue sucker	G3G4	S2		T	1
Fish	Cyprinella caerulea	Blue Shiner	G2	S1	LT	E	3
Fish	Erimonax monachus	Spotfin Chub	G2	S2	LT, XN, PXN	T	3
Fish	Erimystax cahni	Slender Chub	G1	S1	LT	T	3
Fish	Erimystax dissimilis	Streamline Chub	G4	S3S4			1
Fish	Erimystax insignis	Blotched Chub	G4	S3S4			1
Fish	Etheostoma acuticeps	Sharphead Darter	G3	S2S3			1
Fish	Etheostoma akatulo	Bluemask Darter	G1	S1	LE	E	3
Fish	Etheostoma aquali	Coppercheek Darter	G2G3	S2S3		T	1
Fish	Etheostoma baileyi	Emerald Darter	G4G5	S2		D	1
Fish	Etheostoma barbouri	Teardrop Darter	G4G5	S2		D	1
Fish	Etheostoma barrenense	Splendid Darter	G4	S3		D	1
Fish	Etheostoma bellum	Orangefin Darter	G4G5	S3		D	1
Fish	Etheostoma blennius sequatchiense	Sequatchie Blenny Darter	G4T3	S3			1
Fish	Etheostoma boschungi	Slackwater Darter	G1	S1	LT	T	3
Fish	Etheostoma brevirostrum	Holiday Darter	G2	S1		T	1
Fish	Etheostoma cervus	Chickasaw Darter	G2G3	S2S3		D	1
Fish	Etheostoma cinereum	Ashy Darter	G2G3	S2S3		T	1
Fish	Etheostoma corona	Crown Darter	G3	S1S2		E	1
Fish	Etheostoma denoncourti	Golden Darter	G2	S2			1
Fish	Etheostoma ditrema	Coldwater Darter	G2	S1		T	1
Fish	Etheostoma forbesi	Barrens Darter	G1G2	S1		E	1
Fish	Etheostoma gutselli	Tuckasegee Darter	G3G4	S1		E	1
Fish	Etheostoma lemniscatum	Tuxedo Darter	G1	S1	LE	E	3
Fish	Etheostoma luteovinctum	Redband Darter	G4	S4		D	1
Fish	Etheostoma maculatum	Spotted Darter	G2	SP			1
Fish	Etheostoma marmorpinnum	Marbled Darter	G1	S1	LE	E	3
Fish	Etheostoma maydeni	Redlips Darter	G2G3	S2S3		T	1
Fish	Etheostoma microlepidum	Smallscale Darter	G2G3	S2		D	1
Fish	Etheostoma neopterum	Lollypop Darter	G3	S1S2			1
Fish	Etheostoma obeyense	Barcheek Darter	G4	S3			1
Fish	Etheostoma olivaceum	Sooty Darter	G3	S3		D	1

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Fish	Etheostoma percnurum	Duskytail Darter	G1	S1	LE	E	3
Fish	Etheostoma pseudovulatum	Egg-mimic Darter	G1	S1		E	1
Fish	Etheostoma pyrrhogaster	Firebelly Darter	G2G3	S2		D	1
Fish	Etheostoma rupestre	Rock Darter	G4	S3			1
Fish	Etheostoma sagitta	Arrow Darter	G3	S2	C	D	1
Fish	Etheostoma sitikuense	Citico Darter	G1	S1	LE, XN	E	3
Fish	Etheostoma striatulum	Striated Darter	G1	S1		T	1
Fish	Etheostoma susanae	Cumberland Darter	G1G2	S1	LE	E	3
Fish	Etheostoma tippecanoe	Tippecanoe Darter	G3G4	S1S2		D	1
Fish	Etheostoma trisella	Trispot Darter	G1	S1		T	1
Fish	Etheostoma tuscumbia	Tuscumbia Darter	G2	SX		D	1
Fish	Etheostoma vulneratum	Wounded Darter	G3	S2			1
Fish	Etheostoma wapiti	Boulder Darter	G1	S1	LE, XN	E	3
Fish	Fundulus chrysotus	Golden Topminnow	G5	S1S2		D	1
Fish	Fundulus julisia	Barrens Topminnow	G1	S1		E	1
Fish	Hemitremia flammea	Flame Chub	G3	S3		D	1
Fish	Hybognathus placitus	Plains Minnow	G4	S1		D	1
Fish	Hybopsis lineapunctata	Lined Chub	G3G4	S1		D	1
Fish	Ichthyomyzon gagei	Southern Brook Lamprey	G5	S1		D	1
Fish	Ichthyomyzon unicuspis	Silver Lamprey	G5	S2		D	1
Fish	Macrhybopsis gelida	Sturgeon Chub	G3	S1		D	1
Fish	Macrhybopsis meeki	Sicklefin Chub	G3	S2		D	1
Fish	Macrhybopsis sp. 1	Coosa Chub	G3G4	S1			1
Fish	Moxostoma lacerum	Harelip Sucker	GX	SX		D	1
Fish	Moxostoma sp. 2	Sicklefin Redhorse	G2Q	S?	C		1
Fish	Notropis albizonatus	Palezone Shiner	G1	SH	LE	E	3
Fish	Notropis asperifrons	Burrhead Shiner	G4	S2			1
Fish	Notropis buccatus	Silverjaw Minnow	G5	S1		T	1
Fish	Notropis chrosomus	Rainbow Shiner	G4	S3			1
Fish	Notropis dorsalis	Bigmouth Shiner	G5	S1		D	1
Fish	Notropis rubellus	Rosyface Shiner	G5	S2		D	1
Fish	Notropis rupestris	Bedrock Shiner	G2	S2		D	1
Fish	Noturus baileyi	Smoky Madtom	G1	S1	LE, XN	E	3
Fish	Noturus crypticus	Chucky Madtom	G1	S1	LE	E	3
Fish	Noturus fasciatus	Saddled Madtom	G2	S2		T	1
Fish	Noturus flavipinnis	Yellowfin Madtom	G1	S1	LT, XN	E	3
Fish	Noturus gladiator	Piebald Madtom	G3	S3		D	1
Fish	Noturus munitus	Frecklebelly Madtom	G3	S1		T	1

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Fish	Noturus stanauli	Pygmy Madtom	G1	S1	LE	E	3
Fish	Percina antesella	Amber Darter	G1G2	S1	LE	E	3
Fish	Percina aurantiaca	Tangerine Darter	G4	S3		D	1
Fish	Percina burtoni	Blotchside Logperch	G2G3	S2		D	1
Fish	Percina jenkinsi	Conasauga Logperch	G1	S1	LE	E	3
Fish	Percina kusha	Bridled Darter	G2	S1			1
Fish	Percina macrocephala	Longhead Darter	G3	S2		T	1
Fish	Percina phoxocephala	Slenderhead Darter	G5	S3		D	1
Fish	Percina sp. 3	Muscadine Darter	G2Q	S1			1
Fish	Percina squamata	Olive Darter	G3	S2		D	1
Fish	Percina stictogaster	Frecklebelly Darter	G4G5	S1		D	1
Fish	Percina tanasi	Snail Darter	G2G3	S2S3	LT	T	3
Fish	Percina williamsi	Sickle Darter	G2	S2		T	1
Fish	Phenacobius catostomus	Riffle Minnow	G4	S2			1
Fish	Polyodon spathula	Paddlefish	G4	S3	MC		3
Fish	Salvelinus fontinalis	Brook Trout	G5	S3			1
Fish	Scaphirhynchus albus	Pallid Sturgeon	G2	S1	LE	E	3
Fish	Thoburnia atripinnis	Blackfin Sucker	G3	S2		D	1
Fish	Typhlichthys subterraneus	Southern Cavefish	G4	S3		D	1
Flatworm	Sphalloplana buchanani	(a cave obligate planarian)	G1G2	S1			2
Flatworm	Sphalloplana chandleri	Chandler's Planarian	G1G2	S1			2
Flatworm	Sphalloplana consimilis	Powell Valley Planarian	G2G3	S1			2
Flatworm	Sphalloplana percoeca	(a cave obligate planarian)	G5	S3?			2
Flatworm	Sphalloplana sp.	(flatworms)	G?	S?			2
Flatworm	Sphalloplana sp.	(a cave obligate flatworm)	G2	S?			2
Flatworm	Sphalloplana sp. 2	Rumbling Falls Cave Flatworm	G2	S1			2
Gastropod	Anguispira alabama	Alabama Tigersnail	G2	S2			1
Gastropod	Anguispira cumberlandiana	Cumberland Tigersnail	G1G2	S3?			1
Gastropod	Anguispira knoxensis	Rustic Tigersnail	G1	S2S3			1
Gastropod	Anguispira kochi	Banded Tigershell	G4G5	S2?			1
Gastropod	Anguispira picta	Painted Tigersnail	G1	S1	LT	E	3
Gastropod	Athearnia anthonyi	Anthony's Riversnail	G1	S1	LE, XN	E	3
Gastropod	Carychium exile	Ice Thorn	G5	S?			1
Gastropod	Carychium stygium	Cave Thorn	G3	S2			1
Gastropod	Daedalochila auriformis	Rockpile Liptooth	G4	S1			1
Gastropod	Discus bryanti	Sawtooth Disc	G3	S1S2			1
Gastropod	Discus clappi	Channelled Disc	G1	S1			1
Gastropod	Elimia acuta	Acute Elimia	G1	S1			1

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Gastropod	Elimia arachnoidea	Spider Elimia	G3	S2			1
Gastropod	Elimia aterina	Coal Elimia	G1	S1	MC		1
Gastropod	Elimia christyi	Knotty Elimia	G2	S2			1
Gastropod	Elimia porrecta	Nymph Elimia	G1G2	SU	MC		1
Gastropod	Elimia striatula	File Elimia	G2	S2			1
Gastropod	Elimia strigosa	Brook Elimia	G1	S1	MC		1
Gastropod	Elimia teres	Elegant Elimia	G1	S1	MC		1
Gastropod	Elimia troostiana	Mossy Elimia	G1	S1	MC		1
Gastropod	Euchemotrema fraternum montanum	(a pillsnail)	G5T2	S2			1
Gastropod	Fumonelix archeri	Ocoee Covert	G1	S1			1
Gastropod	Fumonelix christyi	Glossy Covert	G3	S2			1
Gastropod	Fumonelix jonesiana	Big-tooth Covert	G1	S1			1
Gastropod	Fumonelix orestes	Engraved Covert	G1	S?			1
Gastropod	Fumonelix wetherbyi	Clifty Covert	G2G3	S2S3			1
Gastropod	Fumonelix wheatleyi	Cinnamon Covert	G4	S3			1
Gastropod	Fumonelix wheatleyi clingmanicus	Clingman Covert	G4T2T3	S2S3	MC		1
Gastropod	Glyphyalinia junaluskana	Dark Glyph	G2	S2?			1
Gastropod	Glyphyalinia ocoae	Blue-gray Glyph	G1	S1			1
Gastropod	Glyphyalinia pentadelphia	Pink Glyph	G2G3	S2			1
Gastropod	Glyphyalinia rimula	Tongued Glyph	G2	S3			1
Gastropod	Glyphyalinia sp.	terrestrial snails	G1	S?			1
Gastropod	Glyphyalinia sp.	terrestrial snails	G1	S?			1
Gastropod	Glyphyalinia sp.	terrestrial snails	G?	S?			1
Gastropod	Glyphyalinia specus	Hollow Glyph	G3	S4			1
Gastropod	Glyphyalinia wheatleyi	Wheatley's glyph	G4	S?			1
Gastropod	Haplotrema kendeighi	Blue-footed Lancetooth	G1G2	S3			1
Gastropod	Helicodiscus aldrichianus	Burrowing Coil	G2	S3?			1
Gastropod	Helicodiscus barri	Raccoon Coil	G2G4	S3S4			1
Gastropod	Helicodiscus enneodon	Bluff Coil	G2Q	S4S5			1
Gastropod	Helicodiscus fimbriatus	Fringed Coil	G4	S3			1
Gastropod	Helicodiscus hadenoecus	Cricket Coil	G3	S3			1
Gastropod	Helicodiscus hexodon	Toothy Coil	G1	S1			1
Gastropod	Helicodiscus multidens	Twilight Coil	G2	S3			1
Gastropod	Helicodiscus notius specus	(a cave snail)	G5T2	S1?			1
Gastropod	Helicodiscus sp.	terrestrial snails	G?	S?			1
Gastropod	Inflectarius downieanus	Dwarf Globelet	G3	S4			1
Gastropod	Inflectarius ferrissi	Smoky Mountain Covert	G2	S2			1
Gastropod	Inflectarius kalmianus	Brown Globelet	G3	S3			1

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Gastropod	Inflectarius smithi	Alabama Shagreen	G2	S2			1
Gastropod	Inflectarius subpalliatus	Velvet Covert	G2	S2			1
Gastropod	Io fluvialis	Spiny Riversnail	G2	S2			1
Gastropod	Leptoxis crassa	Boulder Snail	G1	SH	(PS)		1
Gastropod	Leptoxis umbilicata	Umbilicate Rocksnail	G1Q	S1			1
Gastropod	Leptoxis virgata	Smooth Mudalia	G2	S1			1
Gastropod	Lithasia armigera	Armored Rocksnail	G3G4	S1S2			1
Gastropod	Lithasia curta	Knobby Rocksnail	G1	SX			1
Gastropod	Lithasia duttoniana	Helmet Rocksnail	G2Q	S2			1
Gastropod	Lithasia geniculata fuliginosa	Geniculate River Snail	G3T3Q	S2			1
Gastropod	Lithasia geniculata pinguis	Small Geniculate River Snail	G3T3Q	S2			1
Gastropod	Lithasia jayana	Rugose Rocksnail	G2	S2	MC		1
Gastropod	Lithasia lima	Warty Rocksnail	G2Q	S2			1
Gastropod	Lithasia salebrosa	Muddy Rocksnail	G2G3Q	S2			1
Gastropod	Marstonia ogmorhaphe	Royal Springsnail	G1	S1	LE	E	3
Gastropod	Marstonia scalariformis	Moss Pyrg	G1	SX			1
Gastropod	Megapallifera wetherbyi	Blotchy Mantleslug	G2G3	S3			1
Gastropod	Mesodon altivagus	Wandering Globe	G2G3	S?			1
Gastropod	Mesodon andrewsae	Balsam Globe	G3	S3			1
Gastropod	Mesodon sanus	Squat Globelet	G3	S2S3			1
Gastropod	Mesomphix andrewsae	Mountain Button	G2G3	S3S4			1
Gastropod	Mesomphix rugeli	Wrinkled Button	G4	S3			1
Gastropod	Mesomphix subplanus	Flat Button	G3	S3S4			1
Gastropod	Paravitrea alethia	Goddess Supercoil	G1	S1?			1
Gastropod	Paravitrea andrewsae	High Mountain Supercoil	G2	S3?			1
Gastropod	Paravitrea bellona	Club Supercoil	G1	S?			1
Gastropod	Paravitrea blarina	Shrew Supercoil	G2	S3			1
Gastropod	Paravitrea calcicola	Pearl Supercoil	G1	S1?			1
Gastropod	Paravitrea clappi	Mirey Ridge Supercoil	G2G3	S2S3			1
Gastropod	Paravitrea lamellidens	Lamellate Supercoil	G2	S2			1
Gastropod	Paravitrea lapilla	Gem Supercoil	G2	S3?			1
Gastropod	Paravitrea metallacta	Caney Fork Supercoil	G2	S3			1
Gastropod	Paravitrea petrophila	Cherokee Supercoil	G2G3	S4			1
Gastropod	Paravitrea placentula	Glossy Supercoil	G3	S3			1
Gastropod	Paravitrea reesei	Round Supercoil	G2	S1S2			1
Gastropod	Paravitrea subtilis	Slender Supercoil	G2	S3?			1
Gastropod	Paravitrea tantilla	Teasing Supercoil	G2G3	S4			1
Gastropod	Paravitrea ternaria	Sculpted Supercoil	G1	S1S2	MC		1

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Gastropod	Paravitrea tridens	White-foot Supercoil	G2	S2			1
Gastropod	Paravitrea umbilicaris	Open Supercoil	G2	S2?			1
Gastropod	Paravitrea variabilis	Variable Supercoil	G2G3	S2S3			1
Gastropod	Paravitrea varidens	Roan Supercoil	G1G2	S1S2	MC		1
Gastropod	Patera clarki	Dwarf Proud Globe	G3	S2S3	(PS)		1
Gastropod	Philomycus sellatus	Alabama Mantleslug	G2G3	S3?			1
Gastropod	Philomycus virginicus	Virginia Mantleslug	G3	S2S3			1
Gastropod	Pilsbryna aurea	Ornate Bud	G1	S1			1
Gastropod	Pilsbryna castanea	Prominent Bud	G1	S2			1
Gastropod	Pilsbryna vanattai	Honey Glyph	G2G3	S2S3			1
Gastropod	Pleurocera alveare	Rugged Hornsnail	G3	S2	MC		1
Gastropod	Pleurocera corpulenta	Corpulent Hornsnail	G1	S1			1
Gastropod	Pleurocera curta	Shortspire Hornsnail	G2	S2	MC		1
Gastropod	Pleurocera trochiformis	Sulcate Hornsnail	G2	S2			1
Gastropod	Pleurocera walkeri	Telescope Hornsnail	G1	S1			1
Gastropod	Somatogyrus aureus	Golden Pebblesnail	G1	S1			1
Gastropod	Somatogyrus parvulus	Sparrow Pebblesnail	G1G2Q	SR	MC		1
Gastropod	Somatogyrus sp. 2	Hiwassee Pebblesnail	G1Q	S1			1
Gastropod	Somatogyrus tennesseensis	Opaque Pebblesnail	G1	S1	MC		1
Gastropod	Stenotrema altispira	Highland Slitmouth	G3	S2?			1
Gastropod	Stenotrema angellum	Kentucky Slitmouth	G4	S3			1
Gastropod	Stenotrema calvescens	Chattanooga Slitmouth	G2	S3S4			1
Gastropod	Stenotrema cohuttense	Cohutta Slitmouth	G2	S2			1
Gastropod	Stenotrema depilatum	Great Smoky Slitmouth	G2	S3			1
Gastropod	Stenotrema edgarianum	Sequatchie Slitmouth	G2G3	S2S3			1
Gastropod	Stenotrema exodon	Alabama Slitmouth	G2	S?			1
Gastropod	Stenotrema magnafumosum	Appalachian Slitmouth	G3	S3S4			1
Gastropod	Stenotrema pilula	Pygmy Slitmouth	G3G4	S3			1
Gastropod	Stenotrema waldense	Doaks Creek Slitmouth	G1	S2S3			1
Gastropod	Striatura exigua	Ribbed Striate	G5	S1			1
Gastropod	Succinea greerii	Dryland Ambersnail	G3	S3?			1
Gastropod	Triodopsis anteridon	Carter Threetooth	G3	S1S2			1
Gastropod	Triodopsis claibornensis	Claiborne Threetooth	G2	S2			1
Gastropod	Ventridens coelaxis	Bidentate Dome	G3	S2S3			1
Gastropod	Ventridens decussatus	Crossed Dome	G3	S2?			1
Gastropod	Ventridens eutropis	Carinate Dome	G2	S3?			1
Gastropod	Ventridens lasmodon	Hollow Dome	G3	S4			1
Gastropod	Ventridens percallosus	Tennessee Dome	G2	S3			1

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Gastropod	Vertigo clappi	Cupped Vertigo	G1G2	S1			1
Gastropod	Vertigo parvula	Smallmouth Vertigo	G3	S2S3			1
Gastropod	Vertigo teskeyae	Swamp Vertigo	G5	S1			1
Gastropod	Webbhelix multilineata	Striped Whitelip	G5	S2			1
Gastropod	Xolotrema obstrictum	Sharp Wedge	G3	S5			1
Gastropod	Zonitoides lateumbilicatus	Striate Gloss	G3G4	S2?			1
Insect	Acrotrichis lucidula	Feather-winged Beetle	G2G3	SE1?			2
Insect	Agarodes stannardi	Stannard's Agarodes Caddisfly	GNR	SP	MC		2
Insect	Aleochara lucifuga	(a rove beetle)	G4	S?			2
Insect	Aleochara sp.	(a rove beetle)	G?	S?			2
Insect	Allocapnia brooksi	Sevier Snowfly	G2	S2			2
Insect	Allocapnia cunninghami	Karst Snowfly	G1G2	S1			2
Insect	Allocapnia fumosa	Smokies Snowfly	G2	S3?			2
Insect	Allocapnia perplexa	Perplexing Snowfly	G1	S1			2
Insect	Aloconota diversiseta	(a rove beetle)	G1	S1			2
Insect	Aloconota insecta	(a rove beetle)	G4	S?			2
Insect	Aloconota laurentiana	(a rove beetle)	G4	S?			2
Insect	Amblyscirtes linda	Linda's Roadside Skipper	G2G3	S2			2
Insect	Amphinemura mockfordi	Tennessee Forestfly	G2	S2?			2
Insect	Anillinus longiceps	(a cave obligate beetle)	G?	S?			2
Insect	Anillinus sp.	(a ground beetle)	G?	S?			2
Insect	Anillinus sp.	(undescribed ground beetle)	G1	S?			2
Insect	Anillinus sp. 5	Flag Trail Cave Beetle	G1	S1			2
Insect	Arianops pecki	(a cave ant beetle)	G?	S?			2
Insect	Arianops sp.	(cave ant beetles)	G1	S?			2
Insect	Arianops stygica	(a cave ant beetle)	G1	S?			2
Insect	Arrhopalites benitus	(a springtail)	G4	S?			2
Insect	Arrhopalites caecus	(a springtail)	G4	S?			2
Insect	Arrhopalites marshalli	Marshall’s Cave Springtail	G2	S?			2
Insect	Arrhopalites pavo	(a cave springtail)	G2	S?			2
Insect	Arrhopalites pygmaeus	(a springtail)	G4	S?			2
Insect	Arrhopalites sp.	(a cave obligate springtail)	G1	S1			2
Insect	Arrhopalites sp. 2 near bimus	(undescribed cave springtail)	G1	S?			2
Insect	Arrhopalites sp. 3 near benitus	(undescribed cave springtail)	G1	S?			2
Insect	Arrhopalites sp. 4	(undescribed cave springtail)	G1	S1			2
Insect	Arrhopalites sp. 4 near lacuna	(undescribed cave springtail)	G1	S?			2
Insect	Atheta annexa	(a rove beetle)	G4	S?			2
Insect	Atheta lucifuga	Light Shunning Rove Beetle	G4	S2			2

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Insect	Atheta sp.	(a rove beetle)	G?	S?			2
Insect	Atheta troglophila	(a troglophilic rove beetle)	G4	S?			2
Insect	Atranus pubescens	(a ground beetle)	G4	S?			2
Insect	Batriasymmodes jeanneli	(a cave obligate beetle)	G3	S1S2			2
Insect	Batriasymmodes quisnamus	(a cave obligate beetle)	G3	S3			2
Insect	Batriasymmodes spelaeus	(a cave obligate beetle)	G3G4	S2?			2
Insect	Batrisodes barri	(a cave obligate beetle)	G1G2	S1S2			2
Insect	Batrisodes clypeospecus	(a cave obligate beetle)	G1G2	S1S2			2
Insect	Batrisodes ferulifer	(a cave obligate beetle)	G1	S1			2
Insect	Batrisodes gemmoides	(a cave obligate beetle)	G1	S1			2
Insect	Batrisodes gemmus	(a cave obligate beetle)	G1	S1			2
Insect	Batrisodes pannosus	(a cave obligate beetle)	G1	S1			2
Insect	Batrisodes sp.	ant beetles	G?	S?			2
Insect	Batrisodes sp.	ant beetles	G?	S?			2
Insect	Batrisodes specus	(a beetle)	G3G4	S?			2
Insect	Batrisodes valentinei	(a cave obligate beetle)	G2G4	S3S4			2
Insect	Bembidion lacunarium	ground beetle	G4	S?			2
Insect	Callophrys irus	Frosted Elfin	G3	S2S3			2
Insect	Catops gratiosus	round fungus beetle	G4	S?			2
Insect	Ceratophysella denticulata	Toothed springtail	G4	S?			2
Insect	Ceratophysella sp.	springtails	G?	S?			2
Insect	Ceratophysella undescribed sp., denticulata group	springtail	G?	S?			2
Insect	Ceuthophilus ensifer	cave cricket	G3	S?			2
Insect	Ceuthophilus gracilipes vs. stygius	cave cricket	G4	S?			2
Insect	Ceuthophilus sp.	cave crickets	G?	S?			2
Insect	Ceuthophilus stygius	cave cricket	G4	S?			2
Insect	Cheumatopsyche helma	Helma's Net-spinning Caddisfly	G3	S1S3			2
Insect	Cicindela ancocisconensis	(a tiger beetle)	G3	S2			2
Insect	Darlingtonea kentuckensis	(a ground beetle)	G3G4	S1?			2
Insect	Desoria trispinata	Three-spined springtail	G4	S?			2
Insect	Desoria truncata	Truncate springtail	G4?	S?			2
Insect	Dissochaetus oblitus	round fungus beetle	G4	S?			2
Insect	Euhadenoecus puteaus	cave cricket	G4	S?			2
Insect	Folsomia candida	springtail	G4	S?			2
Insect	Folsomia sp. 2 nr. macrochaeta	(a cave obligate springtail)	G1	S1			2
Insect	Folsomia stella	Stellate springtail	G4	S?			2
Insect	Glyphopsyche sequatchie	Sequatchie Caddisfly	G1	S1	C		2
Insect	Gomphus consanguis	Cherokee Clubtail	G3	S1			2

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Insect	Gomphus sandrius	Tennessee Clubtail	G1	S1			2
Insect	Gomphus septima	Septima's Clubtail	G2	SR			2
Insect	Habrophlebiodes celeteria	(a mayfly)	G2G4	S2	MC		2
Insect	Hadenoecini sp.	cave crickets	G?	S?			2
Insect	Hadenoecus barri	Barr's cave cricket	G4	S?			2
Insect	Hadenoecus jonesi	Jones' cave cricket	G3G4	S?			2
Insect	Hadenoecus opilionides	(a cave obligate cricket)	G3	S3			2
Insect	Hydroperla rickeri	Tennessee Springfly	G2	S2			2
Insect	Hydropsyche etnieri	Buffalo Springs Caddisfly	G2	S2			2
Insect	Hypogastrura antra	springtail	G?	S?			2
Insect	Hypogastrura sp. 1	(a viatica group springtail)	G1	S1			2
Insect	Hypogastrura sp. Denticulata group	springtail	G?	S?			2
Insect	Hypogastrura undescribed sp.	springtails	G?	S?			2
Insect	Lesteva pallipes	rove beetle	G4	S?			2
Insect	Litocampa barryi	(a bristletail)	G?	S?			2
Insect	Litocampa cherokeensis	(a bristletail)	G?	S?			2
Insect	Litocampa cookei	Cooke's Cave Dipluran	G3	S?			2
Insect	Litocampa davisi	(a bristletail)	G?	S?			2
Insect	Litocampa inexspectata	(a bristletail)	G?	S?			2
Insect	Litocampa sp.	(bristletails)	G?	S?			2
Insect	Litocampa sp. 1	undescribed cave dipluran	G1	S?			2
Insect	Litocampa sp. 5	Rumbling Falls Cave Dipluran	G2	S1			2
Insect	Litocampa sp. 6	Buffalo Cove Cave Dipluran	G1	S1			2
Insect	Litocampa sp. 7	Mill Hollow Cave Dipluran	G1	S1			2
Insect	Litocampa sp. 8	Mountain Eye Cave Dipluran	G1	S1			2
Insect	Litocampa valentinei	(a cave obligate bristletail)	G5	S2			2
Insect	Macrocera nobilis	fungus gnat	G4	S?			2
Insect	Macromia margarita	Mountain River Cruiser	G3	S2S3			2
Insect	Megaleuctra williamsae	Williams' Rare Winter Stonefly	G2	S1S2			2
Insect	Megaselia cavernicola	cave hump-backed fly	G5	S?			2
Insect	Neanura sp. 1	Swamp River Cave Neanura	G1	S1			2
Insect	Nelsonites walteri	(a cave obligate beetle)	G3	S3			2
Insect	Nemadus horni	small carrion beetle	G4	S?			2
Insect	Nicrophorus americanus	American Burying Beetle	G2G3	SH	LE		3
Insect	Oconoperla innubila	(a stonefly)	G2	S2?			2
Insect	Onychiurus pseudofimetarius	springtail	G4	S?			2
Insect	Onychiurus reluctus	springtail	G4	S?			2
Insect	Onychiurus sp.	springtails	G?	S?			2

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Insect	Onychiurus sp. 2	Swamp River Cave Onychiurus	G1	S1			2
Insect	Ophiogomphus acuminatus	Acuminate Snaketail	G3	S2			2
Insect	Ophiogomphus alleghaniensis	Allegheny Snaketail	G3T2T3	S1			2
Insect	Ophiogomphus edmundo	Edmund's Snaketail	G1G2	S1			2
Insect	Ophiogomphus howei	Howe's Dragonfly	G3	S3?			2
Insect	Paraleptophlebia kirchneri	(a mayfly)	G1	S1			2
Insect	Perlesta etnieri	(a stonefly)	G1	SNR			2
Insect	Platynus tenuicollis	ground beetle	G4	S?			2
Insect	Plauditus grandis	(a mayfly)	G1	S1			2
Insect	Prionochaeta opaca	small carrion beetle	G4	S?			2
Insect	Pseudanophthalmus acherontis	Echo Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus beakleyi	(a cave obligate beetle)	G3G4	S3			2
Insect	Pseudanophthalmus bendermani	Benderman's Cave Beetle	G1G2	S1S2			2
Insect	Pseudanophthalmus catherinae	Catherine's Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus cerberus cerberus	(a cave obligate beetle)	G3G4T3T4	S?			2
Insect	Pseudanophthalmus ciliaris ciliaris	(a cave obligate beetle)	G3G4T1T2	S1S2			2
Insect	Pseudanophthalmus colemanensis	Coleman Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus cumberlandus	(a cave obligate beetle)	G3	S3			2
Insect	Pseudanophthalmus digitus	(a cave obligate beetle)	G1G2	S2			2
Insect	Pseudanophthalmus engelhardti	Engelhart's Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus farrelli	(a cave obligate beetle)	G1G2	S1S2			2
Insect	Pseudanophthalmus fowlerae	Fowler's Cave Beetle	G1	S1	C		2
Insect	Pseudanophthalmus fulleri	(a cave obligate beetle)	G2G3	S2S3			2
Insect	Pseudanophthalmus hesperus	(a cave obligate beetle)	G1	S1			2
Insect	Pseudanophthalmus humeralis	(a cave obligate beetle)	G2	S2			2
Insect	Pseudanophthalmus inquisitor	Inquirer Cave Beetle	G1	S1	C		2
Insect	Pseudanophthalmus insularis	Baker Station Cave Beetle	GH	S1	C		2
Insect	Pseudanophthalmus intermedius	Intermediate cave beetle	G2	S?			2
Insect	Pseudanophthalmus jonesi	Grassy Cove Cave Beetle	G1G2	S1S2			2
Insect	Pseudanophthalmus loganensis	(a cave obligate beetle)	G2G3	S1S2			2
Insect	Pseudanophthalmus longiceps	Long-headed Cave Beetle	G1G2	S1			2
Insect	Pseudanophthalmus macradei	(a cave obligate beetle)	G1G2	S1S2			2
Insect	Pseudanophthalmus nickajackensis	Nickajack Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus nortoni	Norton's Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus occidentalis	Western Cave Beetle	G1G2	S1			2
Insect	Pseudanophthalmus pallidus	Pale Cave Beetle	G1G2	S1S2			2
Insect	Pseudanophthalmus paradoxus	Ridgetop Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus paulus	Nobletts Cave Beetle	GH	S1	C		2

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Insect	Pseudanophthalmus paynei	Payne's Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus princeps	(a cave obligate beetle)	G1G2	S?		S1S2	2
Insect	Pseudanophthalmus productus	(a cave obligate beetle)	G3G4	S3			2
Insect	Pseudanophthalmus pusillus	Tiny Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus robustus	(a cave obligate beetle)	G3G4	S3			2
Insect	Pseudanophthalmus rotundatus	(a cave obligate beetle)	G2	S2			2
Insect	Pseudanophthalmus scutilus	New Mammoth Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus sidus	Meredith Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus simplex	Simple Cave Beetle	G1G2	S1S2			2
Insect	Pseudanophthalmus sp.	Keyhole cave beetle	G1	S?			2
Insect	Pseudanophthalmus sp.	cave ground beetles	G1	S?			2
Insect	Pseudanophthalmus sp.	(a cave obligate beetle)	G?	S?			2
Insect	Pseudanophthalmus sp.	Aaron Tolletts cave beetle	G1	S?			2
Insect	Pseudanophthalmus sp.	Wilmoth cave beetle	G1	S?			2
Insect	Pseudanophthalmus sp.	Caney Hollow cave ground beetle	G1	S?			2
Insect	Pseudanophthalmus sp.	Sells cave ground beetle	G2	S?			2
Insect	Pseudanophthalmus sp.	Baker cave beetle	G1	S?			2
Insect	Pseudanophthalmus sp. 27	Rumbling Falls Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus sp. 29	Falling Springs Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus sp. 30	Ace in the Hole Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus sp. 36	Millers Cave Beetle	GNR	S1?			2
Insect	Pseudanophthalmus sp. 36	Gunters Cave Beetle	G?	S?		S1?	2
Insect	Pseudanophthalmus sp. A englehardti group	(a cave obligate beetle)	G?	S?			2
Insect	Pseudanophthalmus sp. B englehardti group	(a cave obligate beetle)	G?	S?			2
Insect	Pseudanophthalmus sp. B jonesi group	(a cave obligate beetle)	G?	S?			2
Insect	Pseudanophthalmus sp. TN #1 SCA or TN #28?	(a cave obligate beetle)	G1	S1			2
Insect	Pseudanophthalmus templetoni	(a cave obligate beetle)	G1	S1			2
Insect	Pseudanophthalmus tennesseensis	(a cave obligate beetle)	G3	S2			2
Insect	Pseudanophthalmus tiresias	Indian Grave Point Cave Beetle	G1	S1	C		2
Insect	Pseudanophthalmus tullahoma	Duck River Cave Beetle	G1G2	S1			2
Insect	Pseudanophthalmus unionis	Union County Cave Beetle	G1G2	S1			2
Insect	Pseudanophthalmus valentinei	(a cave obligate beetle)	G3G4	S2S3			2
Insect	Pseudanophthalmus vanburenensis	(a cave obligate beetle)	G1	S1			2
Insect	Pseudanophthalmus ventus	Blowing Cave Beetle	G1	S1			2
Insect	Pseudanophthalmus wallacei	Wallace's Cave Beetle	G1	S1			2
Insect	Pseudosinella aera	(a cave obligate springtail)	G4	S2			2
Insect	Pseudosinella aera	(a cave springtail)	G?	S?			2
Insect	Pseudosinella alba	White springtail	G4	S?			2

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Insect	Pseudosinella cf. christianseni	(a cave springtail)	G?	S?			2
Insect	Pseudosinella cf. gisini	(a cave springtail)	G?	S?			2
Insect	Pseudosinella cf. nata	(a cave springtail)	G?	S?			2
Insect	Pseudosinella christianseni	Christiansen's Cave Springtail	G5	S2			2
Insect	Pseudosinella collina	(a springtail)	G3G4	S?			2
Insect	Pseudosinella hirsuta	Hirsute Cave Springtail	G5	S3			2
Insect	Pseudosinella orba	(a cave obligate springtail)	G3G4	S2			2
Insect	Pseudosinella pecki	Peck’s cave springtail	G2	S?			2
Insect	Pseudosinella sp.	(a springtail)	G?	S?			2
Insect	Pseudosinella sp. 5	Swamp River Cave Pseudosinella	G1	S1			2
Insect	Pseudosinella sp. 6	(a cave obligate springtail)	G1	S1			2
Insect	Pseudosinella sp. 7 nr. Nata	(a cave obligate springtail)	G1	S1			2
Insect	Pseudosinella spinosa	Spinose Cave Springtail	G5	S2			2
Insect	Pseudosinella undescribed sp. near espanita	cave springtail	G1	S?			2
Insect	Psyllipsocus ramburi	(a cave barklice)	G4	S?			2
Insect	Ptomaphagus barri	(a cave obligate beetle)	G2G3	S1S2			2
Insect	Ptomaphagus chromolithus	(a cave obligate beetle)	G2G3	S1			2
Insect	Ptomaphagus fecundus	(a cave obligate beetle)	G1	S1			2
Insect	Ptomaphagus hatchi	Hatch’s cave fungus beetle	G3	S3?			2
Insect	Ptomaphagus hubrichti	(a cave obligate beetle)	G2G3	S1			2
Insect	Rhadine caudata	ground beetle	G4	S?			2
Insect	Sciara sp.	fungus gnats	G?	S?			2
Insect	Semiothisa fraserata	Fraser Fir Geometrid Moth	G2?	S2?			2
Insect	Sensillanura barberi	Barber's Springtail	G4	S?			2
Insect	Sinella basidens	(a cave obligate springtail)	G3G4	S1?			2
Insect	Sinella cavernarum	(a springtail)	G5	S3			2
Insect	Speleochus steevesi	(a cave obligate beetle)	G?	S?			2
Insect	Speleochus undescribed species	(a beetle)	G?	S?			2
Insect	Spelobia tenebrarum	Cave dung fly	G5	S?			2
Insect	Speyeria diana	Diana Fritillary	G3G4	S3			2
Insect	Stenonema sinclairi	(a mayfly)	G2	S2			2
Insect	Stenoponia americana	flea	G5	S?			2
Insect	Subterrochus ferus	cave ant beetle	G1G2	S?			2
Insect	Subterrochus sp.	cave ant beetles	G1	S?			2
Insect	Tomocerus bidentatus	Two-toothed springtail	G4	S?			2
Insect	Tomocerus dubius	springtail	G4	S?			2
Insect	Tomocerus flavescens	Golden springtail	G5	S?			2
Insect	Tomocerus missus	Relict cave springtail	G4	S?			2

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Insect	Tomocerus sp.	springtails	G1	S?			2
Insect	Trechus cumberlandus	Cumberland Ground Beetle	G2	S2			2
Insect	Trechus tennesseensis tauricus	(a carabid beetle)	GNRTNR	S1			2
Insect	Trechus tennesseensis tennesseensis	(a carabid beetle)	GNRTNR	S1			2
Insect	Trechus tuckaleechee	(a carabid beetle)	GNR	S2			2
Insect	Triacanthella copelandi	Copeland's Cave Springtail	G1	S1			2
Insect	Tychobythinus strinatii	(a cave obligate beetle)	G1G2	S1S2			2
Insect	Typhlogastrura christianseni	Christiansen's cave springtail	G1	S?			2
Insect	Undetermined species	sepsid Black scavenger fly	G?	S?			2
Insect	Zapada chila	(a stonefly)	G2	S2?			2
Mammal	Condylura cristata	Star-nosed Mole	G5	S2		D	1
Mammal	Glaucomys sabrinus coloratus	Carolina Northern Flying Squirrel	G5T2	S1S2	LE	E	3
Mammal	Martes pennanti	Fisher	G5	S1			1
Mammal	Microtus chrotorrhinus carolinensis	Southern Rock Vole	G4T3	S2		D	1
Mammal	Mustela nivalis	Least Weasel	G5	S2			1
Mammal	Napaeozapus insignis	Woodland Jumping Mouse	G5	S4		D	1
Mammal	Neotoma floridana haematoreia	Southern Appalachian Woodrat	G5T4Q	S2		D	1
Mammal	Neotoma floridana illinoensis	Eastern Woodrat	G5T5	S3		D	1
Mammal	Neotoma magister	Allegheny Woodrat	G3G4	S3		D	1
Mammal	Ochrotomys nuttalli	Golden Mouse	G5	SU			1
Mammal	Parascalops breweri	Hairy-tailed Mole	G5	S3		D	1
Mammal	Sorex cinereus	Cinereus Shrew	G5	S4		D	1
Mammal	Sorex dispar	Long-tailed Shrew	G4	S2		D	1
Mammal	Sorex fumeus	Smoky Shrew	G5	S4		D	1
Mammal	Sorex hoyi	American Pygmy Shrew	G5	S2			1
Mammal	Sorex longirostris	Southeastern Shrew	G5	S4		D	1
Mammal	Sorex palustris	American Water Shrew	G5	S2		D	1
Mammal	Spilogale putorius	Eastern Spotted Skunk	G4	S3			1
Mammal	Sylvilagus transitionalis	Appalachian Cottontail	G4	S3	MC		3
Mammal	Synaptomys cooperi	Southern Bog Lemming	G5	S4		D	1
Mammal	Tamiasciurus hudsonicus	Red Squirrel	G5	S4S5			3
Mammal	Zapus hudsonius	Meadow Jumping Mouse	G5	S4	No Status	D	1
Millipede	Ameractis satis	(a cave obligate milliped)	G4	S?			2
Millipede	Cambala sp.	millipeds	G?	S?			2
Millipede	Chaetaspis debilis	(a cave obligate millipede)	G?	S?			2
Millipede	Chaetaspis mollis	(a cave obligate millipede)	G1	S1			2
Millipede	Chaetaspis sp.	cave millipeds	G?	S?			2
Millipede	Chaetaspis sp. 1	Thunder Run Cave Millipede	G1	S1			2

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Millipede	Delophon holti	Hamblen County Millipede	GNR	S1			2
Millipede	Ophyiulus pilosus	(a millipede)	G?	S?			2
Millipede	Pseudotremia acheron	(a cave obligate millipede)	G1G2	S1			2
Millipede	Pseudotremia cercops	(a cave obligate millipede)	G1	S1			2
Millipede	Pseudotremia deprehendor	(a cave obligate millipede)	G2G3	S1?			2
Millipede	Pseudotremia eburnea	(a cave obligate millipede)	G2G4	S?			2
Millipede	Pseudotremia garlandae	Garland's Cave Millipede	G1	S1			2
Millipede	Pseudotremia lethe	(a cave obligate millipede)	G1	S1			2
Millipede	Pseudotremia lictor	(a cave obligate millipede)	G1	S1			2
Millipede	Pseudotremia manni	Mann's Cave Millipede	G1	S1			2
Millipede	Pseudotremia minos	Russell cave milliped	G1	S?			2
Millipede	Pseudotremia n. sp.	(a cave obligate millipede)	G?	S?			2
Millipede	Pseudotremia nodosa	(a cave obligate millipede)	G4	S2S3			2
Millipede	Pseudotremia rhadamanthus	(a cave obligate millipede)	G1G2	S1			2
Millipede	Pseudotremia roebuckorum	Roebuck's Cave Millipede	G1	S1			2
Millipede	Pseudotremia sp.	cave millipeds	G?	S?			2
Millipede	Pseudotremia sp. 10	Baker cave milliped	G1	S?			2
Millipede	Pseudotremia sp. 5	Three Forks cave milliped	G1	S?			2
Millipede	Pseudotremia sp. 6	Slippery slit cave milliped	G1	S?			2
Millipede	Pseudotremia sp. 7	Barr’s cave milliped	G?	S?			2
Millipede	Pseudotremia sp. 8	Skylight cave milliped	G1	S?			2
Millipede	Pseudotremia sp. 9	Holliday’s cave milliped	G1	S?			2
Millipede	Pseudotremia undescribed sp.	Hoffman’s cave milliped	G1	S?			2
Millipede	Pseudotremia undescribed sp.	Shear’s cave milliped	G1	S?			2
Millipede	Pseudotremia valga	(a cave obligate millipede)	G1G2	S1?			2
Millipede	Pseudotremia wallaceae	Wallace's Cave Millipede	G1	S1			2
Millipede	Scoterpes blountensis	(a cave obligate millipede)	G?	S?			2
Millipede	Scoterpes copei	(a cave obligate millipede)	G3G4Q	S1			2
Millipede	Scoterpes hesperus	(a cave obligate millipede)	G?	S?			2
Millipede	Scoterpes jackdanieli	(a cave obligate millipede)	G?	S?			2
Millipede	Scoterpes musicarustica	(a cave obligate millipede)	G?	S?			2
Millipede	Scoterpes sp.	cave millipeds	G1	S?			2
Millipede	Scoterpes sp.	cave millipeds	G2	S?			2
Millipede	Scoterpes sp.	cave millipeds	G?	S?			2
Millipede	Scoterpes tricorner	(a cave obligate millipede)	G?	S?			2
Millipede	Scoterpes undescribed sp.	(a cave milliped)	G2G3	S?			2
Millipede	Scoterpes ventus	Eastern Tennessee Cave Millipede	G3	S1			2
Millipede	Tetracion jonesi	(a cave obligate millipede)	G3G4	S1S2			2

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Millipede	Tetracion tennesseensis	(a cave obligate millipede)	G2G3	S2S3			2
Plant	Abies fraseri	Fraser Fir	G2	S1S2		T	4
Plant	Acalypha deamii	Deam's Copperleaf	G4?	S1		S	4
Plant	Acer leucoderme	Chalk Maple	G5	S3		S	4
Plant	Acmella oppositifolia	Creeping Spotflower	G5	S3		S	4
Plant	Aconitum reclinatum	Trailing Wolfsbane	G3	S1		E	4
Plant	Acrobolbus ciliatus	(a liverwort)	G3?	S1		S	4
Plant	Adlumia fungosa	Climbing Fumitory	G4	S2		T	4
Plant	Agalinis auriculata	Earleaved False-foxglove	G3	S2		E	4
Plant	Agalinis heterophylla	Prairie False-foxglove	G4G5	S1		E	4
Plant	Agalinis oligophylla	Ridge-stem False-foxglove	G4	S1		E	4
Plant	Agalinis plukenetii	Purple Gerardia	G3G5	SH		E-P	4
Plant	Agalinis setacea	Thread-leaved Gerardia	G5?	SH		S	4
Plant	Agastache scrophulariifolia	Purple Giant Hyssop	G4	S1S2		T	4
Plant	Ageratina luciae-brauniae	Lucy Braun's White Snakeroot	G3	S3		T	4
Plant	Agrostis mertensii	Arctic Bentgrass	G5	SH		S	4
Plant	Allium burdickii	Narrow-leaf Ramps	G4G5	S1S2		T-CE	4
Plant	Allium stellatum	Glade Onion	G5	S1		E	4
Plant	Allium tricoccum	Ramps	G5	S1S2		S-CE	4
Plant	Alnus viridis ssp. crispa	Green Alder	G5T5	S1		S	4
Plant	Amelanchier sanguinea	Roundleaf Shadbush	G5	S2		T	4
Plant	Ammoselinum popei	Pope's Sand-parsley	G4	S2		T	4
Plant	Amsonia tabernaemontana var. gattingeri	Limestone Blue Star	G5T3Q	S3		S	4
Plant	Anastrophyllum saxicola	(a liverwort)	G3G4	S1		S	4
Plant	Anemone canadensis	Canada Anemone	G5	SX		E-P	4
Plant	Anemone caroliniana	Carolina Anemone	G5	S1S2		E	4
Plant	Angelica atropurpurea	Great Angelica	G5	S1		T	4
Plant	Apios priceana	Price's Potato-bean	G2	S3	LT	E	4
Plant	Arabis hirsuta	Western Hairy Rockcress	G5	S1		T	4
Plant	Archidium alternifolium	(a moss)	G4G5	S1		T	4
Plant	Arenaria lanuginosa	Wooly Sandwort	G5	S1		E	4
Plant	Aristida ramosissima	Branched Three-awn Grass	G5	SH		E-P	4
Plant	Arnoglossum plantagineum	Fen Indian-plantain	G4G5	S2		T	4
Plant	Asclepias purpurascens	Purple Milkweed	G5?	S1		S	4
Plant	Asplenium scolopendrium var. americanum	Hart's-tongue Fern	G4T3	S1	LT	E	4
Plant	Astilbe crenatiloba	Roan False Goat's-beard	GXQ	SX		E-P	4
Plant	Astragalus bibullatus	Pyne's Ground-plum	G1	S1	LE	E	4
Plant	Astragalus tennesseensis	Tennessee Milk-vetch	G3	S3		S	4

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Plant	Athyrium filix-femina ssp. angustum	Northern Lady Fern	G5T5	S2		S	4
Plant	Aureolaria patula	Spreading False-foxglove	G3	S3		S	4
Plant	Bacopa caroliniana	Carolina Water-hyssop	G4G5	S1		S	4
Plant	Baptisia bracteata var. leucophaea	Cream Wild-indigo	G4G5T4T5	S1S2		S	4
Plant	Bazzania nudicaulis	(a liverwort)	G2G3	S2		T	4
Plant	Berberis canadensis	American Barberry	G3	S2		S	4
Plant	Betula papyrifera var. cordifolia	Heart-leaved Paper Birch	G5T5	S1		E	4
Plant	Boechera patens	Spreading Rockcress	G3	S1		E	4
Plant	Boechera perstellata	Braun's Rockcress	G2	S1	LE	E	4
Plant	Boechera shortii	Short's Rockcress	G5	S1S2		S	4
Plant	Bolboschoenus fluviatilis	River Bulrush	G5	S1		S	4
Plant	Botrychium jenmanii	Alabama Grapefern	G3G4	S1		T	4
Plant	Botrychium matricariifolium	Chamomile Grapefern	G5	S1		S	4
Plant	Botrychium oneidense	Blunt-lobed Grapefern	G4Q	S1		S	4
Plant	Botrychium simplex	Least Grape-fern	G5	S1		S	4
Plant	Brachydontium trichodes	Peak Moss	G2G4	S1		E	4
Plant	Brachyelytrum aristosum	Northern Shorthusk	G4G5	S2		S	4
Plant	Bryoxiphium norvegicum	Sword Moss	G5?	S1		T	4
Plant	Buckleya distichophylla	Piratebush	G2	S2		T	4
Plant	Bulbostylis ciliatifolia var. coarctata	Capillary Hairsedge	G5T3T5	SH		E-P	4
Plant	Calamagrostis cainii	Cain's Reedgrass	G1	S1		E	4
Plant	Calamagrostis porteri	Porter's Reedgrass	G4	S1		E	4
Plant	Calamovilfa arcuata	Cumberland Sand-Grass	G2	S2		T	4
Plant	Calopogon oklahomensis	Oklahoma Grass-pink	G4?	SH		E-P	4
Plant	Caltha palustris	Marsh Marigold	G5	S1		E	4
Plant	Campanula aparinoides	Marsh Bellflower	G5	S2		S	4
Plant	Cardamine clematitis	Mountain Bittercress	G3	S2		T	4
Plant	Cardamine flagellifera	Running Bittercress	G3	S2		T	4
Plant	Cardamine rotundifolia	Round-leaf Watercress	G4	S2S3		S	4
Plant	Carex alopecoidea	Foxtail Sedge	G5	SH		E-P	4
Plant	Carex argyrantha	Hay Sedge	G5	S1		T	4
Plant	Carex barrattii	Barratt's Sedge	G4	S2		E	4
Plant	Carex bromoides ssp. montana	Blue Ridge Brome Sedge	G5T3?	S1		T	4
Plant	Carex bullata	Button Sedge	G5	S3		S	4
Plant	Carex bulbostylis	False Hair Sedge	GNR	SU		S	4
Plant	Carex buxbaumii	Brown Bog Sedge	G5	S1		E	4
Plant	Carex chapmanii	Chapman's Sedge	G3	S1		T	4
Plant	Carex comosa	Bristly Sedge	G5	S2		T	4

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Plant	Carex davisii	Davis' Sedge	G4	S1		S	4
Plant	Carex echinata ssp. echinata	Little Prickly Sedge	G5T5	S1?		S	4
Plant	Carex foenea	Dry-spike Sedge	G5	S1		T	4
Plant	Carex folliculata	northern long sedge	G4G5	S1		S	4
Plant	Carex fumosimontana	Smoky Mountain Sedge	G?	S2		S	4
Plant	Carex gravida	Heavy Sedge	G5	S1		S	4
Plant	Carex hirtifolia	Pubescent Sedge	G5	S1S2		S	4
Plant	Carex hitchcockiana	Hitchcock's Sedge	G5	S1		T	4
Plant	Carex hyalina	Tissue Sedge	G4	S1		S	4
Plant	Carex lacustris	Lake-bank Sedge	G5	S1		T	4
Plant	Carex lonchocarpa	Southern Long Sedge	G5	S2		E	4
Plant	Carex manhartii	Manhart's Sedge	G3G4	S2		E	4
Plant	Carex misera	Wretched Sedge	G3	S2		T	4
Plant	Carex muskingumensis	Muskingum Sedge	G4	S1		E	4
Plant	Carex ouachitana	Ouachita Sedge	G4	S1		S	4
Plant	Carex oxylepis var. pubescens	Hairy Sharp-scaled Sedge	G5?T3	S1		S	4
Plant	Carex pallescens	Pale Sedge	G5	S1		S	4
Plant	Carex pellita	Woolly Sedge	G5	S1		E	4
Plant	Carex reniformis	Reniform Sedge	G4?	S1		S	4
Plant	Carex roanensis	Roan Mountain Sedge	G3	S2		E	4
Plant	Carex rostrata	Beaked Sedge	G5	SRF		T	4
Plant	Carex ruthii	Ruth's Sedge	G3	S2		T	4
Plant	Carex sterilis	Sterile Sedge	G4	SH		E-P	4
Plant	Carex vestita	Velvety Sedge	G5	SH		E-P	4
Plant	Carex x aestivaliformis	(a hybrid sedge)	GNA	S1		S	4
Plant	Castanea dentata	American Chestnut	G4	S2S3		S	4
Plant	Caulophyllum giganteum	Giant Blue Cohosh	G4G5Q	S1		T	4
Plant	Cephaloziella massalongi	(a liverwort)	G3G5	S1		E	4
Plant	Cephaloziella spinicaulis	(a liverwort)	G3G4	S1		S	4
Plant	Cerastium velutinum var. velutinum	Velvety Cerastium	G5T4?	S1		E	4
Plant	Ceratophyllum echinatum	Prickly Hornwort	G4?	S1		S	4
Plant	Chelone obliqua	Red Turtlehead	G4	S1		S	4
Plant	Chrysogonum virginianum	Green-and-gold	G5	S2		T	4
Plant	Cimicifuga rubifolia	Appalachian Bugbane	G3	S3		T	4
Plant	Clematis fremontii	Fremont's Virgin's-bower	G5	S1		E	4
Plant	Clematis glaucophylla	White-leaved Leather-flower	G4?	S1		E	4
Plant	Clematis morefieldii	Morefield's Leather-flower	G2	S2	LE	E	4
Plant	Clematis pitcheri	Pitcher Leather-flower	G4G5	SH		T	4

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Plant	Clethra alnifolia	Coastal Sweet Pepper-bush	G5	S1		E	4
Plant	Clintonia borealis	Clinton's Lily	G5	S2S3		S	4
Plant	Coeloglossum viride var. virescens	Long-bracted Green Orchid	G5T5	S1		E	4
Plant	Coelorachis rugosa	Wrinkled Jointgrass	G5	S1		S	4
Plant	Collinsia verna	Spring Blue-eyed Mary	G5	S1		E	4
Plant	Cololejeunea ornata	Ornate Cololejeunea	G2G4	S1		T	4
Plant	Comptonia peregrina	Sweet-fern	G5	S1		E	4
Plant	Conradina verticillata	Cumberland Rosemary	G3	S3	LT	T	4
Plant	Corallorhiza maculata	Spotted Coralroot	G5	S1		T	4
Plant	Coreopsis delphiniifolia	Larkspur-leaved Coreopsis	G3?Q	S1		E	4
Plant	Coreopsis latifolia	Broad-leaved Tickseed	G3	S1S2		E	4
Plant	Cornus obliqua	Silky Dogwood	G5T5	S2		S	4
Plant	Corydalis sempervirens	Pale Corydalis	G4G5	S1S2		E	4
Plant	Cotinus obovatus	American Smoketree	G4	S2		S	4
Plant	Crataegus harbisonii	Harbison's Hawthorn	G1	S1		E	4
Plant	Crotalaria purshii	Pursh's Rattlebox	G5	SH		E-P	4
Plant	Croton alabamensis	Alabama Croton	G3	SH		E-P	4
Plant	Cymophyllus fraserianus	Fraser's Sedge	G4	S3		S	4
Plant	Cyperus dentatus	Toothed Sedge	G4	S1		S	4
Plant	Cyperus plukenetii	Plukenet's Galingale	G5	SH		S	4
Plant	Cypripedium acaule	Pink Lady's-slipper	G5	S4		S-CE	4
Plant	Cypripedium kentuckiense	Southern Lady's-slipper	G3	S2		E	4
Plant	Cypripedium reginae	Showy Lady's-slipper	G4	S1		E	4
Plant	Dalea candida	White Prairie-clover	G5	S2		S	4
Plant	Dalea foliosa	Leafy Prairie-clover	G2G3	S2S3	LE	E	4
Plant	Dalea purpurea	Purple Prairie-clover	G5	S1		E	4
Plant	Danthonia epilis	Bog Oat-grass	G3G4	S1S2		S	4
Plant	Delphinium exaltatum	Tall Larkspur	G3	S2		E	4
Plant	Desmodium ochroleucum	Creamflower Tick-trefoil	G1G2	S1		E	4
Plant	Diamorpha smallii	Small's Stonecrop	G4	S1S2		E	4
Plant	Diarrhena obovata	Beak Grass	G4G5	S1		S	4
Plant	Dichanthelium aciculare	Needleleaf Witchgrass	G5	S1		E	4
Plant	Dichanthelium acuminatum ssp. leucothrix	Roughish Witchgrass	G4?Q	S1		S	4
Plant	Dichanthelium acuminatum ssp. spretum	Eaton's Witchgrass	G5	S1		E	4
Plant	Dichanthelium ensifolium ssp. curtifolium	Short-leaved Panic Grass	G3?	S1		E	4
Plant	Dichanthelium ensifolium ssp. ensifolium	Small-leaved Panicgrass	GNR	S2		S	4
Plant	Didiplis diandra	Water-purslane	G5	S1		T	4
Plant	Diervilla lonicera	Northern Bush-honeysuckle	G5	S2		T	4

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Plant	Diervilla sessilifolia var. rivularis	Mountain Bush-honeysuckle	G3	S2		T	4
Plant	Diplophyllum andrewsii	A Liverwort	G3	S1		S	4
Plant	Draba cuneifolia	Wedge-leaved Whitlow-grass	G5	S1S2		S	4
Plant	Draba ramosissima	Branching Whitlow-grass	G4	S2		S	4
Plant	Drepanolejeunea appalachiana	(a liverwort)	G2?	S1		S	4
Plant	Drosera brevifolia	Dwarf Sundew	G5	S2		T	4
Plant	Drosera capillaris	Pink Sundew	G5	S1		T	4
Plant	Drosera rotundifolia	Roundleaf Sundew	G5	S1		T	4
Plant	Dryopteris carthusiana	Spinulose Shield-fern	G5	S1		T	4
Plant	Dryopteris cristata	Crested Shield-fern	G5	S2		T	4
Plant	Echinacea pallida	Pale-purple Coneflower	G4	S1		E	4
Plant	Echinacea simulata	Wavy-leaf Purple Coneflower	G3	S2		T	4
Plant	Echinacea tennesseensis	Tennessee Coneflower	G2	S2	MC	T	4
Plant	Echinochloa walteri	Walter's Barnyard Grass	G5	S1		S	4
Plant	Echinodorus berteroi	Erect Burhead	G5	S1		S	4
Plant	Eleocharis compressa	Flat-stemmed Spike-rush	G4	S1		S	4
Plant	Eleocharis equisetoides	Horse-tail Spike-rush	G4	S1		E	4
Plant	Eleocharis intermedia	Matted Spike-rush	G5	S1		E	4
Plant	Eleocharis lanceolata	Lance-like Spike-rush	G4G5	S1		S	4
Plant	Eleocharis tortilis	Twisted Spike-rush	G5	S1		S	4
Plant	Eleocharis wolfii	Wolf Spike-rush	G3G4	S1		E	4
Plant	Elodea nuttallii	Nuttall's Waterweed	G5	S2		S	4
Plant	Elymus svensonii	Svenson's Wild-rye	G3	S2		E	4
Plant	Entodon concinnus	Lime Entodon	G4G5	S1		S	4
Plant	Epilobium angustifolium	Fireweed	G5	S1		T	4
Plant	Epilobium ciliatum	Hairy Willow-herb	G5	S1		T	4
Plant	Epilobium leptophyllum	Linear-leaved Willow-herb	G5	S1		T	4
Plant	Eriocaulon decangulare	Ten-angle pipewort	G5	S1		E	4
Plant	Eriogonum longifolium var. harperi	Harper's Umbrella-plant	G4T2	S1		E	4
Plant	Eriophorum virginicum	Tawny Cotton-grass	G5	S1S2		E	4
Plant	Eryngium integrifolium	Blue-flower Coyote-thistle	G5	S1		T	4
Plant	Erysimum capitatum	Western Wallflower	G5	S1S2		E	4
Plant	Erythronium rostratum	Beaked Trout-lily	G5	S2		S	4
Plant	Euonymus obovatus	Running Strawberry-bush	G?	S?			4
Plant	Eupatorium leucolepis	White-bracted Thoroughwort	G5	S1		E	4
Plant	Eupatorium steelei	Steele's Joe-pye Weed	G4	S?			4
Plant	Eurybia saxicastellii	Rockcastle Aster	G1G2	S1S2		E	4
Plant	Eurybia schreberi	Schreber's Aster	G4	S1		S	4

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Plant	Evolvulus nuttallianus	Evolvulus	G5	S3		S	4
Plant	Festuca paradoxa	Cluster Fescue	G5	S1		S	4
Plant	Fimbristylis perpusilla	Harper's Fimbristylis	G2	S1		E	4
Plant	Fimbristylis puberula	Hairy Fimbristylis	G5	S1S2		T	4
Plant	Fissidens appalachensis	Appalachian Fissidens Moss	G2G3	S1		T	4
Plant	Fissidens clebschii	Clebsch's Pocket Moss	GHQ	SH		S	4
Plant	Fothergilla major	Mountain Witch-alder	G3	S2		T	4
Plant	Frullania appalachiana	A Liverwort	G1?	S1?		E	4
Plant	Frullania obcordata	Swamp Frullania	G4G5	S1		S	4
Plant	Fuirena squarrosa	Hairy Umbrella-sedge	G4G5	S1		S	4
Plant	Funaria americana	(a moss)	G3?	S1?		T	4
Plant	Galium asprellum	Rough Bedstraw	G5	S1		S	4
Plant	Galium palustre	Marsh Bedstraw	G5	S1		S	4
Plant	Galium uniflorum	Fragrant Bedstraw	G4G5	S1		S	4
Plant	Gaylussacia dumosa	Dwarf Huckleberry	G5	S3		T	4
Plant	Gelsemium sempervirens	Yellow Jessamine	G5	S1S2		S	4
Plant	Gentiana austromontana	Appalachian Gentian	G3	S3		S	4
Plant	Gentiana linearis	Narrow-leaved Gentian	G4G5	S1		T	4
Plant	Gentiana puberulenta	Downy Gentian	G4G5	S1		E	4
Plant	Geranium robertianum	Herb-robert	G5	S1		S	4
Plant	Geum aleppicum	Yellow Avens	G5	S1		E	4
Plant	Geum geniculatum	Bent Avens	G1G2	S1		E	4
Plant	Geum laciniatum	Rough Avens	G5	S1		S	4
Plant	Geum radiatum	Spreading Avens	G2	S1	LE	E	4
Plant	Glyceria acutiflora	Sharp-scaled Mannagrass	G5	S2		S	4
Plant	Glyceria laxa	Northern Mannagrass	G5	S1		S	4
Plant	Glyceria nubigena	Smoky Mountains Mannagrass	G2	S1S2		T	4
Plant	Goodyera repens	Dwarf Rattlesnake-plantain	G5	S1		S	4
Plant	Gratiola floridana	Florida Hedge-hyssop	G4	S1		E	4
Plant	Grimmia olneyi	Grimmia Moss	G3G5	SH		S	4
Plant	Gymnoderma lineare	Rock Gnome Lichen	G2	S1	LE	E	4
Plant	Gymnomitrion laceratum	(a liverwort)	G3G5	S1		T	4
Plant	Gymnopogon brevifolius	Broad-leaved Beardgrass	G5	S1S2		S	4
Plant	Hasteola suaveolens	Sweet-scented Indian-plantain	G4	S2		S	4
Plant	Hedyotis purpurea var. montana	Roan Mountain Bluet	G5T2	S1	LE	E	4
Plant	Helenium brevifolium	Shortleaf Sneezeweed	G4	S1		E	4
Plant	Helianthemum bicknellii	Plains Frostweed	G5	SH		E-P	4
Plant	Helianthemum canadense	Canada Frostweed	G5	SH		E-P	4

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Plant	Helianthemum propinquum	Low Frostweed	G4	S1S2		E	4
Plant	Helianthus eggertii	Eggert's Sunflower	G3	S3	MC	S	4
Plant	Helianthus glaucophyllus	White-leaved Sunflower	G3	S1		T	4
Plant	Helianthus occidentalis	Naked-stem Sunflower	G5	S2		S	4
Plant	Helianthus verticillatus	Whorled Sunflower	G1Q	S1	C	E	4
Plant	Heracleum maximum	Cow-parsnip	G5	S2		S	4
Plant	Heteranthera limosa	Blue Mud-plantain	G5	S1S2		T	4
Plant	Heteranthera multiflora	Multiflowered Mud-plantain	G4	S1		S	4
Plant	Heuchera longiflora var. aceroides	Maple-leaf Alumroot	G4T2Q	S2		S	4
Plant	Hexastylis virginica	Virginia Heartleaf	G4	S2		S	4
Plant	Hieracium longipilum	Hairy Hawkweed	G4G5	S1		S	4
Plant	Hieracium scabrum	Rough Hawkweed	G5	S2		T	4
Plant	Homaliadelphus sharpii	Sharp's Homaliadelphus	G3?	S1		E	4
Plant	Hottonia inflata	Featherfoil	G4	S2		S	4
Plant	Huperzia appalachiana	Appalachian Fir Clubmoss	G4G5	S1		T	4
Plant	Hydrastis canadensis	Goldenseal	G4	S3		S-CE	4
Plant	Hydrocotyle americana	American Water-pennywort	G5	S1		E	4
Plant	Hydrolea ovata	Ovate Fiddleleaf	G5	S1		S	4
Plant	Hydrophyllum virginianum	Appalachian Waterleaf	G5	S3		T	4
Plant	Hymenophyllum tayloriae	Taylor's Filmy Fern	G2	S2		S	4
Plant	Hypericum adpressum	Creeping St. John's-wort	G3	S1		E	4
Plant	Hypericum ellipticum	Pale St. John's-wort	G5	S1		E	4
Plant	Hypericum graveolens	Mountain St. John's-wort	G3	S3		E	4
Plant	Hypericum mitchellianum	Blue Ridge St. John's-wort	G3	S2		T	4
Plant	Iris brevicaulis	Lamance Iris	G4	S1		E	4
Plant	Iris fulva	Copper Iris	G5	S2		T	4
Plant	Iris prismatica	Slender Blue Flag	G4G5	S2S3		T	4
Plant	Isoetes lacustris	Lake Quillwort	G?	S?			4
Plant	Isoetes melanopoda	Blackfoot Quillwort	G5	S1S2		E	4
Plant	Isoetes tennesseensis	Hiwassee Quillwort	G1	S1		E	4
Plant	Isotria medeoloides	Small Whorled Pogonia	G2	S1	LT	E	4
Plant	Juglans cinerea	Butternut	G4	S3		T	4
Plant	Juncus brachycephalus	Small-headed Rush	G5	S2		S	4
Plant	Juncus brachyphyllus	Shortleaf Rush	GNR	SU		S	4
Plant	Juncus gymnocarpus	Naked-fruited Rush	G?	S?			4
Plant	Juncus trifidus	Highland Rush	G5	SH		E-P	4
Plant	Jungermannia fossombronioides	(a liverwort)	G4	S1		S	4
Plant	Jungermannia pyriflora	(a liverwort)	G4	S1		S	4

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Plant	Kalmia angustifolia var. carolina	Lambkill	G5T4	SX		E-P	4
Plant	Krigia montana	False Dandelion	G3	S1		T	4
Plant	Lachnanthes caroliana	Carolina Redroot	G4	S1		E	4
Plant	Lachnocaulon anceps	Bog-buttons	G5	SH		T	4
Plant	Lathyrus palustris	Marsh Pea	G5	S1		S	4
Plant	Leavenworthia exigua var. exigua	Glade-cress	G4T3	S3S4		S	4
Plant	Leavenworthia exigua var. lutea	Pasture Glade-cress	G4T1	SH		E-P	4
Plant	Lechea pulchella	Leggett's Pinweed	G5	S1		E	4
Plant	Lejeunea blomquistii	Blomquist Leafy Liverwort	G1G2	S1S2		S	4
Plant	Lejeunea sharpii	Sharp's Lejeunea	G2G3	S1S2		E	4
Plant	Leptodontium viticulosoides var. sulphureum	Grandfather Mountain Leptodontium	G2	S1S2		E	4
Plant	Leptohymenium sharpii	Mount Leconte Moss	G1	S1		E	4
Plant	Leptoscyphus cuneifolius	(a liverwort)	G4G5	S1		E	4
Plant	Lespedeza angustifolia	Narrowleaf Bushclover	G5	S2		T	4
Plant	Leucothoe racemosa	Fetter-bush	G5	S2		T	4
Plant	Liatris cylindracea	Slender Blazing-star	G5	S2		T	4
Plant	Liatris pilosa	Shaggy Blazing Star	G5?	S1		S	4
Plant	Liatris virgata	Wand Gayfeather	GU	S?			4
Plant	Lilium canadense	Canada Lily	G5	S3		T	4
Plant	Lilium grayi	Gray's Lily	G3	S1		E	4
Plant	Lilium michiganense	Michigan Lily	G5	S3		T	4
Plant	Lilium philadelphicum	Wood Lily	G5	S1		E	4
Plant	Linnaea borealis	Twinflower	G5	SX		E-P	4
Plant	Liparis loeselii	Fen Orchid	G5	S1		T	4
Plant	Listera australis	Southern Twayblade	G4	S1S2		E	4
Plant	Listera smallii	Kidneyleaf Twayblade	G4	S?			4
Plant	Lobelia amoena	Southern Lobelia	G4?	S1S2		T	4
Plant	Lobelia canbyi	Canby's Lobelia	G4	S2S3		T	4
Plant	Lonicera canadensis	American Fly-honeysuckle	G5	S1		T	4
Plant	Lonicera dioica	Mountain Honeysuckle	G5	S2		S	4
Plant	Lonicera flava	Yellow Honeysuckle	G5?	S1		T	4
Plant	Lonicera prolifera	Grape Honeysuckle	G5	SH		E-P	4
Plant	Lophocolea appalachiana	(a liverwort)	G1G2Q	S1		S	4
Plant	Lophocolea muricata	(a liverwort)	G5	S1		T	4
Plant	Ludwigia sphaerocarpa	Globe-fruited False-loosestrife	G5	S1		T	4
Plant	Lycopodiella alopecuroides	Foxtail Clubmoss	G5	S2		T	4
Plant	Lycopodiella inundata	Bog Clubmoss	G5	S?			4
Plant	Lycopodium annotinum	Stiff Clubmoss	G5	SH		E-P	4

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Plant	Lycopodium dendroideum	Treelike Clubmoss	G5	S1		S	4
Plant	Lysimachia fraseri	Fraser's Loosestrife	G3	S2		E	4
Plant	Lysimachia quadriflora	Four-flowered Loosestrife	G5?	S1		E	4
Plant	Lysimachia terrestris	Swamp Loosestrife	G5	S1		E	4
Plant	Lysimachia x producta	Loosestrife	GNA	S1		S	4
Plant	Magnolia virginiana	Sweetbay Magnolia	G5	S2		T	4
Plant	Maianthemum stellatum	Starflower False Solomon's-seal	G5	S1		E	4
Plant	Mannia triandra	(a liverwort)	G3G4	S1		T	4
Plant	Marshallia grandiflora	Large-flowered Barbara's-Buttons	G2	S2		E	4
Plant	Marshallia obovata	Piedmont Barbara's-Buttons	G4G5	S1		T	4
Plant	Marshallia trinervia	Broad-leaved Barbara's-Buttons	G3	S2S3		T	4
Plant	Marsupella funckii	(a liverwort)	G4G5	S1		E	4
Plant	Meehania cordata	Heartleaf Meehania	G5	S2		T	4
Plant	Megaceros aenigmaticus	Megaceros	G2G3	S2S3		S	4
Plant	Melanthium latifolium	Broadleaf Bunchflower	G5	S1S2		E	4
Plant	Melanthium virginicum	Virginia Bunchflower	G5	S1		E	4
Plant	Melanthium woodii	Ozark Bunchflower	G5	S1		E	4
Plant	Menziesia pilosa	Minniebush	G4G5	S2		S	4
Plant	Metzgeria uncigera	Metzgeria	G3	S1		S	4
Plant	Microlejeunea globosa	Cardot's Lejeunea	G3?	S1		S	4
Plant	Mielichhoferia elongata	(a moss)	G4?	S1		S	4
Plant	Milium effusum var. cisatlanticum	Tall Millet-grass	G5	S1		S	4
Plant	Minuartia cumberlandensis	Cumberland Sandwort	G2G3	S2	LE	E	4
Plant	Minuartia godfreyi	Godfrey's Stitchwort	G1	S1		E	4
Plant	Minuartia groenlandica	Mountain Sandwort	G5	S1		E	4
Plant	Minuartia muscorum	Dixie Stitchwort	GNR	SU		S	4
Plant	Mirabilis albida	Pale Umbrella-wort	G5	S2		T	4
Plant	Mnium carolinianum	Carolina Mnium	G3	S1		S	4
Plant	Monotropsis odorata	Sweet Pinesap	G3	S2		T	4
Plant	Muhlenbergia cuspidata	Plains Muhly	G4	S1		E	4
Plant	Muhlenbergia glabrifloris	Hair Grass	G4?	S1		S	4
Plant	Muhlenbergia torreyana	Torrey's Dropseed	G3	S1		E	4
Plant	Myriophyllum pinnatum	Cutleaf Water-milfoil	G5	S1		E	4
Plant	Myurella julacea	(a moss)	G5	SH		S-P	4
Plant	Nemopanthus collinus	Long-stalked Holly	G3	S1		S	4
Plant	Neobeckia aquatica	Lake Cress	G4?	S2		S	4
Plant	Nestronia umbellula	Nestronia	G4	S1		E	4
Plant	Neviusia alabamensis	Alabama Snow-wreath	G2	S2		T	4

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Plant	Oenothera macrocarpa	Missouri Primrose	G5	S2		T	4
Plant	Oenothera parviflora	Northern Evening-primrose	G4?	S1		S	4
Plant	Oncophorus raui	A Moss	G3	S2		T	4
Plant	Onosmodium hispidissimum	Shaggy False Gromwell	G4	S1		E	4
Plant	Onosmodium molle ssp. occidentale	Western False Gromwell	G4G5T4?	S1S2		T	4
Plant	Onosmodium molle ssp. subsetosum	Smooth False Gromwell	G4G5T4?	S1		E	4
Plant	Ophioglossum crotalophoroides	Bulbous Adder's-tongue	G5	SH		S	4
Plant	Orobanche ludoviciana	Louisiana Broomrape	G5	SH		S	4
Plant	Orthodontium pellucens	Translucent Orthodontium	G5	SH		S	4
Plant	Packera plattensis	Prairie Ragwort	G5	S1		S	4
Plant	Packera schweinitziana	Schweinitz's ragwort	G5?	S1		T	4
Plant	Palamocladium leskeoides	Palamocladium Moss	G3G5	S1		T	4
Plant	Panax quinquefolius	American Ginseng	G3G4	S3S4		S-CE	4
Plant	Panicum hemitomon	Maidencane	G5?	S2		S	4
Plant	Parnassia grandifolia	Large-leaved Grass-of-parnassus	G3	S3		S	4
Plant	Paronychia argyrocoma	Silverling	G4	S1S2		T	4
Plant	Paxistima canbyi	Canby's Mountain-lover	G2	S1		E	4
Plant	Paysonia densipila	Duck River Bladderpod	G3	S3		T	4
Plant	Paysonia perforata	Spring Creek Bladderpod	G1	S1	LE	E	4
Plant	Paysonia stonensis	Stones River Bladderpod	G1	S1		E	4
Plant	Pedicularis lanceolata	Swamp Lousewort	G5	S1S2		S	4
Plant	Pedinophyllum interruptum	(a liverwort)	G3G4	S1		S	4
Plant	Pellia appalachiana	(a liverwort)	G4	S2		S	4
Plant	Penstemon tubiflorus	Small-flowered Beardtongue	G5	S1		S	4
Plant	Perideridia americana	Thicket Parsley	G4	S2		E	4
Plant	Phacelia ranunculacea	Blue Scorpion-weed	G4	S2S3		S	4
Plant	Phegopteris connectilis	Northern Beechfern	G5	S1		S	4
Plant	Phemeranthus calcaricus	Limestone Fameflower	G3	S3		S	4
Plant	Phemeranthus mengesii	Menge's Fameflower	G3	S2		T	4
Plant	Phemeranthus teretifolius	Roundleaf Fameflower	G4	S2		T	4
Plant	Phlox bifida ssp. stellaria	Glade Cleft Phlox	G5?T3	S3		T	4
Plant	Phlox pilosa ssp. ozarkana	Ozark Downy Phlox	G5T4?	S1S2		S	4
Plant	Phlox subulata	Moss Phlox	G5	S1		T	4
Plant	Physaria globosa	Short's Bladderpod	G2	S2	C	E	4
Plant	Pieris floribunda	Mountain Fetter-bush	G4	S2		T	4
Plant	Pilularia americana	American Pillwort	G5	S1S2		S	4
Plant	Pityopsis ruthii	Ruth's Golden-aster	G1	S1	LE	E	4
Plant	Plagiochila caduciloba	Gorge Leafy Liverwort	G2	S2		S	4

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Plant	Plagiochila eurphyllon ssp. echinata	A Liverwort	GNRT2	S2		S	4
Plant	Plagiochila exigua	(a liverwort)	G4?	S1S2		S	4
Plant	Plagiochila punctata	Spotty featherwort	G5	S1		S	4
Plant	Plagiochila retrorsa	(a liverwort)	GNR	S1		S	4
Plant	Plagiochila sullivantii	Sullivant's Leafy Liverwort	G2	S2		S	4
Plant	Plantago cordata	Heart-leaved Plantain	G4	S1		E	4
Plant	Platanthera cristata	Yellow Crested Orchid	G5	S2S3		S	4
Plant	Platanthera flava var. herbiola	Tubercled Rein-orchid	G4T4Q	S2		T	4
Plant	Platanthera grandiflora	Large Purple Fringed Orchid	G5	S2		E	4
Plant	Platanthera integra	Yellow Fringeless Orchid	G3G4	S1		E	4
Plant	Platanthera integrilabia	White Fringeless Orchid	G2G3	S2S3	C	E	4
Plant	Platanthera nivea	Snowy Orchid	G5	S1		E	4
Plant	Platanthera orbiculata	Large Round-leaved Orchid	G5	S3		T	4
Plant	Platanthera psycodes	Small Purple Fringed Orchid	G5	S2		S	4
Plant	Poa palustris	Fowl Bluegrass	G5	S1		E	4
Plant	Poa saltuensis	Drooping Bluegrass	G5	S1		T	4
Plant	Pogonia ophioglossoides	Rose Pogonia	G5	S2		E	4
Plant	Polygala boykinii	Boykin's Milkwort	G4	S2		T	4
Plant	Polygala mariana	Maryland Milkwort	G5	S1		S	4
Plant	Polygala nana	Dwarf Milkwort	G5	S1		E	4
Plant	Polygala nuttallii	Nuttall's Milkwort	G5	S1		E	4
Plant	Polygonella americana	Southern Jointweed	G5	S1S2		E	4
Plant	Polygonum arifolium	Halberd-leaf Tearthumb	G5	S1		T	4
Plant	Polygonum cilinode	Fringed Black Bindweed	G5	S1S2		T	4
Plant	Polytaenia nuttallii	Prairie Parsley	G5	S1		T	4
Plant	Ponthieva racemosa	Shadow-witch	G4G5	S1		E	4
Plant	Populus grandidentata	Large-tooth Aspen	G?	S?			4
Plant	Porella gracillima	Hot Porella	G1	S1		E	4
Plant	Porella wataugensis	Watauga Porella	G1G2Q	S1S2		T	4
Plant	Potamogeton amplifolius	Large-leaf Pondweed	G5	S1		T	4
Plant	Potamogeton epihydrus	Nuttall's Pondweed	G5	S1S2		S	4
Plant	Potamogeton tennesseensis	Tennessee Pondweed	G2	S2		T	4
Plant	Potentilla tridentata	Three-toothed Cinquefoil	G5	S1S2		S	4
Plant	Preissia quadrata	Narrow Mushroom-headed Liverwort	G5	S1		T	4
Plant	Prenanthes alba	White Rattlesnakeroot	G5	S1		S	4
Plant	Prenanthes aspera	Rough Rattlesnake-root	G4?	S1		E	4
Plant	Prenanthes barbata	Bearded Rattlesnake-root	G3	S2		S	4
Plant	Prenanthes crepidinea	Nodding Rattlesnake-root	G4	S2		S	4

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Plant	Prenanthes roanensis	Mountain Rattlesnake-root	G3	S3		PD	4
Plant	Prunus pumila	Sand Cherry	G5	S1		E	4
Plant	Prunus virginiana	Choke Cherry	G5	S1		S	4
Plant	Pseudognaphalium helleri	Heller's Catfoot	G4G5	S2		S	4
Plant	Pycnanthemum beadlei	Beadle's Mountain Mint	G2G4	S1S2		E	4
Plant	Pycnanthemum torrei	Torrey's Mountain-mint	G2	S1		S	4
Plant	Pycnanthemum verticillatum	Whorled Mountain-mint	G5	SH		E-P	4
Plant	Pyrola americana	American Wintergreen	G5	S2		E	4
Plant	Quercus margarettiae	Sand Post Oak	G5	S1		S	4
Plant	Radula sullivantii	A Liverwort	G3	SNA		S	4
Plant	Radula voluta	(a liverwort)	G3	S2		S	4
Plant	Ranunculus aquatilis var. diffusus	White Water-buttercup	G5T5	S1		E	4
Plant	Ranunculus flabellaris	Yellow Water-crowfoot	G5	S2		T	4
Plant	Ranunculus harveyi	Harvey's buttercup	GNR	S1		S	4
Plant	Rhachithecium perpusillum	Budding Tortula	G4G5	SH		S	4
Plant	Rhamnus alnifolia	Alderleaf Buckthorn	G5	S1		E	4
Plant	Rhynchosia latifolia	Prairie Rhynchosia	G5	SH		E-P	4
Plant	Rhynchospora alba	White Beakrush	G5	SH		E-P	4
Plant	Rhynchospora caduca	Falling Beaked-rush	G5	S1		S	4
Plant	Rhynchospora capillacea	Horned Beakrush	G4	S1		E	4
Plant	Rhynchospora chalarocephala	Loose-headed Beakrush	G5	S1		T	4
Plant	Rhynchospora debilis	Savannah Beaksedge	G4?	S1		E	4
Plant	Rhynchospora latifolia	Giant White-top Sedge	G5	SH		E-P	4
Plant	Rhynchospora perplexa	Obscure Beak-rush	G5	S2		T	4
Plant	Rhynchospora rariflora	Few-flowered Beak-rush	G5	S1		E	4
Plant	Rhynchospora wrightiana	Wright's Beak-rush	G5	SH		E-P	4
Plant	Ribes curvatum	Granite Gooseberry	G4	S1		T	4
Plant	Ribes missouriense	Missouri Gooseberry	G5	S2		S	4
Plant	Ribes odoratum	Buffalo Currant	G5T4T5	SH		T	4
Plant	Rosa virginiana	Virginia Rose	G5	SH		S	4
Plant	Rudbeckia subtomentosa	Sweet Coneflower	G5	S2		T	4
Plant	Rudbeckia triloba var. pinnatiloba	Pinnate-lobe Black-eyed-susan	G5T3	SX		E-P	4
Plant	Ruellia purshiana	Pursh's Wild-petunia	G3	S1S2		S	4
Plant	Rugelia nudicaulis	Rugel's Ragwort	G3	S2		E	4
Plant	Sabatia capitata	Cumberland Rose Gentian	G2	S2		E	4
Plant	Sacciolepis striata	Gibbous Panic-grass	G5	S1		S	4
Plant	Sagittaria brevirostra	Short-beaked Arrowhead	G5	S1		T	4
Plant	Sagittaria graminea	Grassleaf Arrowhead	G5	S1		T	4

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Plant	Sagittaria platyphylla	Ovate-leaved Arrowhead	G5	S2S3		S	4
Plant	Sagittaria rigida	Sessile-fruited Arrowhead	G5	S1		E	4
Plant	Salvia azurea var. grandiflora	Blue Sage	G4G5T4?	S3		S	4
Plant	Sanguisorba canadensis	Canada Burnet	G5	S1		E	4
Plant	Sarracenia oreophila	Green Pitcher Plant	G2	SX	LE	E-P	4
Plant	Saxifraga caroliniana	Carolina Saxifrage	G3	S1S2		E	4
Plant	Saxifraga pensylvanica	Swamp Saxifrage	G5	S1		E	4
Plant	Schisandra glabra	Red Starvine	G3	S2		T	4
Plant	Schoenolirion croceum	Yellow Sunnybell	G4	S3		T	4
Plant	Schoenoplectus subterminalis	Water Bulrush	G4G5	S1		S	4
Plant	Schwalbea americana	Chaffseed	G2G3	SX	LE	E-P	4
Plant	Scleria verticillata	Low Nutrush	G5	S2		S	4
Plant	Scopelophila cataractae	Agoyan Cataract Moss	G3	S1		S	4
Plant	Scutellaria arguta	Hairy Skullcap	G1?Q	S1		E	4
Plant	Scutellaria montana	Large-flowered Skullcap	G3	S2	LT	T	4
Plant	Scutellaria saxatilis	Rock Skullcap	G3	S3		S	4
Plant	Sedum nevii	Nevius' Stonecrop	G3	S1		E	4
Plant	Seymeria cassioides	Senna Seymeria	G5	SH		E-P	4
Plant	Sida hermaphrodita	Virginia Mallow	G3	SH		E-P	4
Plant	Silene caroliniana ssp. pensylvanica	Carolina Pink	G5T4T5	S1S2		T	4
Plant	Silene ovata	Ovate Catchfly	G3	S2		E	4
Plant	Silene regia	Royal Catchfly	G3	SH		E-P	4
Plant	Silphium brachiatum	Cumberland Rosinweed	G2G3	S3		E	4
Plant	Silphium laciniatum	Compass Plant	G5	S2		T	4
Plant	Silphium pinnatifidum	Southern Prairie-dock	G3Q	S2		T	4
Plant	Silphium wasiotense	Kentucky Rosinweed	G3	S2		E	4
Plant	Smilax laurifolia	Laurel-leaf Greenbrier	G5	S1		S	4
Plant	Solidago arenicola	Southern racemose goldenrod	G2G3	S1S2		S	4
Plant	Solidago auriculata	Eared Goldenrod	G4	S1		T	4
Plant	Solidago faucibus	Gorge Goldenrod	G2G4	S1		S	4
Plant	Solidago gattingeri	Gattinger's Goldenrod	G3?Q	S1		E	4
Plant	Solidago lancifolia	Broadleaf Goldenrod	G3G4Q	S1		E	4
Plant	Solidago ptarmicoides	Prairie Goldenrod	G5	S1S2		E	4
Plant	Solidago rupestris	Rock Goldenrod	G4?	S1		E	4
Plant	Solidago spithamaea	Blue Ridge Goldenrod	G1	S1	LT	E	4
Plant	Solidago stricta var. gracillima	Virginia Goldenrod	G4?	S1		S	4
Plant	Solidago tarda	Late Goldenrod	G4?Q	SH		S	4
Plant	Sparganium androcladum	Branching Bur-reed	G4G5	S1		E	4

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Plant	Sphenolobopsis pearsoni	Sphenolobopsis	G2?	S1		E	4
Plant	Spiraea alba	Narrow-leaved Meadow-sweet	G5	S1		E	4
Plant	Spiraea virginiana	Virginia Spiraea	G2	S2	LT	E	4
Plant	Spiranthes lucida	Shining Ladies'-tresses	G5	S1S2		T	4
Plant	Spiranthes magnicamporum	Great Plains Ladies'-tresses	G4	S1		E	4
Plant	Spiranthes ochroleuca	Yellow Nodding Ladies'-tresses	G4	S1		E	4
Plant	Spiranthes odorata	Sweetscent Ladies'-tresses	G5	S1		E	4
Plant	Sporobolus heterolepis	Northern Dropseed	G5	S1		T	4
Plant	Sporobolus junceus	Pinelands Dropseed	G5	S1		E	4
Plant	Stachys clingmanii	Clingman's Hedge-nettle	G2Q	S1S2		T	4
Plant	Stellaria alsine	Trailing Stitchwort	G5	S1		E	4
Plant	Stellaria fontinalis	Water Stitchwort	G3	S3		S	4
Plant	Stellaria longifolia	Longleaf Stitchwort	G5	S1		E	4
Plant	Streptopus amplexifolius	White Mandarin	G5	S1		T	4
Plant	Streptopus roseus	Rosy Twisted-stalk	G5	S2		S	4
Plant	Stylisma humistrata	Southern Morning-glory	G4G5	S1		T	4
Plant	Sullivantia sullivantii	Sullivantia	G4	S1		E	4
Plant	Symphyotrichum ericoides var. ericoides	White Heath Aster	G5T5	SH		T	4
Plant	Symphyotrichum oolentangiense	Sky-blue Aster	G5	S1		S	4
Plant	Symphyotrichum praealtum	Willow Aster	G5	S1		E	4
Plant	Symphyotrichum pratense	Barrens Silky Aster	G4?	S1		E	4
Plant	Symplocarpus foetidus	Skunk-cabbage	G5	S1		E	4
Plant	Symplocos tinctoria	Horse-sugar	G5	S2		S	4
Plant	Taxus canadensis	American Yew	G5	S1		E	4
Plant	Tetragonotheca helianthoides	Pineland Squarehead	G5	SH		E-P	4
Plant	Tetrodontium brownianum	Little Georgia	G3G4	S1		S	4
Plant	Thalictrum coriaceum	Leatherleaf Meadowrue	G4	S1		S	4
Plant	Thaspium pinnatifidum	Cutleaf Meadow-parsnip	G2G3	S1		E	4
Plant	Thelypteris simulata	Bog Fern	G4G5	SH		E-P	4
Plant	Thermopsis fraxinifolia	Ash-leaved Bush-pea	G3?	S3		T	4
Plant	Thermopsis mollis	Allegheny Mountain golden banner	G3G4	S2S3		S	4
Plant	Thuja occidentalis	Northern White Cedar	G5	S3		S	4
Plant	Torreyochloa pallida	Pale Manna Grass	G5	S1		S	4
Plant	Tortula ammonsiana	Ammons's Tortula	G1	S1		E	4
Plant	Tortula fragilis	Fragile Tortula	G5	S1		E	4
Plant	Triadenum fraseri	Marsh St. John's-wort	G5	S1?		S	4
Plant	Triantha glutinosa	Sticky Bog-asphodel	G4G5	S1		E	4
Plant	Triantha racemosa	Coastal False-asphodel	G5	S1		E	4

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Plant	Trichomanes boschianum	Bristle-fern	G4	S1S2		T	4
Plant	Trichomanes petersii	Dwarf Filmy-fern	G4G5	S2		T	4
Plant	Trichophorum cespitosum	Tufted Club-rush	G5	S1		E	4
Plant	Tridens flavus var. chapmanii	Chapman's Redtop	G5T3	SH		S	4
Plant	Trientalis borealis	Northern Starflower	G5	S1		T	4
Plant	Trifolium calcaricum	Running Glade Clover	G1	S1		E	4
Plant	Trifolium reflexum	Buffalo Clover	G3G4	S1		E	4
Plant	Trillium decumbens	Trailing Trillium	G4	S1		E	4
Plant	Trillium lancifolium	Narrow-leaved Trillium	G3	S1		E	4
Plant	Trillium pusillum	Least Trillium	G3	S2		E	4
Plant	Trillium rugelii	Southern Nodding Trillium	G3	S2		E	4
Plant	Tsuga caroliniana	Carolina Hemlock	G3	S3		T	4
Plant	Turritis glabra	Tower-mustard	G5	S1		S	4
Plant	Ulmus crassifolia	Cedar Elm	G5	S2		S	4
Plant	Utricularia cornuta	Horned Bladderwort	G5	S1		E	4
Plant	Utricularia inflata	Inflated Bladderwort	G5	S1		S	4
Plant	Utricularia resupinata	Resupinate Bladderwort	G4	S1		S	4
Plant	Utricularia subulata	Zigzag Bladderwort	G5	S1		T	4
Plant	Vaccinium elliottii	Mayberry	G5	S1		E	4
Plant	Vaccinium macrocarpon	Cranberry	G4	S2		T	4
Plant	Veronica americana	American Speedwell	G5	S1		S	4
Plant	Veronica catenata	Sessile Water-speedwell	G5	S1		E	4
Plant	Veronica scutellata	Marsh-speedwell	G5	S1		E	4
Plant	Viburnum bracteatum	Limerock Arrowwood	G1G2	S2		E	4
Plant	Viburnum molle	Softleaf Arrow-wood	G5	S2		E	4
Plant	Viola tripartita var. tripartita	Three-parted Violet	G5T3	S2S3		S	4
Plant	Vitis rupestris	Sand Grape	G3	S1		E	4
Plant	Woodsia scopulina ssp. appalachiana	Alleghany Cliff-fern	G4T4	S1S2		S	4
Plant	Woodwardia virginica	Virginia Chainfern	G5	S2		S	4
Plant	Xerophyllum asphodeloides	Eastern Turkeybeard	G4	S3		T	4
Plant	Xyris ambigua	Coastal Plain Yellow-eyed Grass	G5	S1		E	4
Plant	Xyris fimbriata	Fringed Yellow-eyed Grass	G5	S1		E	4
Plant	Xyris laxifolia var. iridifolia	Wide-leaved Yellow-eyed Grass	G4G5T4T5	S2		T	4
Plant	Xyris tennesseensis	Tennessee Yellow-eyed Grass	G2	S1	LE	E	4
Plant	Zanthoxylum americanum	Northern Prickly-ash	G5	S2		S	4
Plant	Zigadenus glaucus	White Camas	G4G5	S1		E	4
Plant	Zigadenus leimanthoides	Death-camas	G4Q	S2		T	4
Reptile	Anolis carolinensis	Green Anole	G5	S3			1

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	SWAP Tier
Reptile	Apalone mutica	Smooth Softshell Turtle	G5	S4			1
Reptile	Clonophis kirtlandii	Kirtlands Snake	G2	S1			1
Reptile	Coluber flagellum	Coachwhip	G5	S2S3?			1
Reptile	Crotalus horridus	Timber Rattlesnake	G4	S4			1
Reptile	Glyptemys muhlenbergii	Bog Turtle	G3	S1	SAT	T	1
Reptile	Heterodon platirhinos	Eastern Hognosed Snake	G5	S4			1
Reptile	Macrochelys temminckii	Alligator Snapping Turtle	G3G4	S2S3		D	1
Reptile	Nerodia cyclopion	Mississippi Green Watersnake	G5	S2		D	1
Reptile	Nerodia erythrogaster flavigaster	Yellowbelly Water Snake	G5T5	HYB			1
Reptile	Nerodia erythrogaster neglecta	Copperbelly Watersnake	G5T3	S2S3	No Status		3
Reptile	Ophisaurus attenuatus longicaudus	Eastern Slender Glass Lizard	G5T5	S3		D	1
Reptile	Pituophis melanoleucus melanoleucus	Northern Pinesnake	G4T4	S3		T	1
Reptile	Plestiodon anthracinus	Coal Skink	G5	S1		D	1
Reptile	Sistrurus miliarius streckeri	Western Pygmy Rattlesnake	G5T5	S2S3		T	1
Reptile	Terrapene carolina	Eastern Box Turtle	G5	S4			1
Reptile	Thamnophis proximus	Western Ribbonsnake	G5	S4S5			1
Reptile	Virginia striatula	Rough Earth Snake	G5	S2S3?			1
Roundworm	Cambarincola alienus	(a cave obligate roundworm)	G1G2	S1			2
Roundworm	Cambarincola leptadenus	(a cave obligate roundworm)	G1G2	S1			2
Roundworm	Cambarincola marthae	(a cave obligate roundworm)	G1G2	S1			2
Roundworm	Eremidrilus allegheniensis	(a cave obligate roundworm)	G1G2	S1S2			2
Tardigrade	Calohypsibius schusteri	Schuster's Tardigrade	GNR	S1			2
Tardigrade	Hypsibius roanensis	Roan Tardigrade	GNR	S1			2

Table 2: 2015 Additions to the TN State Wildlife Action Plan Species of Greatest Conservation Need List.

Information in Table 2 is sorted first according to SWAP Tier designation, defined below, then by taxa group. All plants are new Tier 4 species, and can be reviewed in Table 1. A total of 98 new Tier 1 species were selected for addition to the GCN list in 2015.

Tier 1: Species defined as wildlife under Tennessee Code Annotated 70-8-101, (i.e., amphibians, birds, fish, mammals, reptiles, crustaceans & mollusks), excluding federally listed and game species
Tier 2: All other fauna not defined as wildlife under Tennessee law (i.e., insects and other invertebrates)
Tier 3: Federally listed or game species which have alternative conservation funding
Tier 4: Plant species of Greatest Conservation Need

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
1	Amphibian	Ambystoma texanum	Smallmouth Salamander	G5	S5		
1	Amphibian	Desmognathus abditus	Cumberland Dusky Salamander	G2G3	S2S3		
1	Amphibian	Desmognathus imitator	Imitator Salamander	G3G4	S3		
1	Amphibian	Desmognathus organi	Northern Pygmy Salamander	G3	SNR		
1	Amphibian	Eurycea aquatica	Brown-backed Salamander	G3	SNR		
1	Amphibian	Gyrinophilus palleucus palleucus	Pale Salamander	G2G3T2	S?		
1	Amphibian	Necturus maculosus	Mudpuppy	G5	S5		
1	Amphibian	Plethodon montanus	Northern Gray-cheeked Salamander	G4	S3		
1	Amphibian	Plethodon shermani	Red-legged Salamander	G2	S2		
1	Amphibian	Siren intermedia	Lesser Siren	G5	S5		
1	Bat	Myotis lucifugus	Little Brown Bat	G5	S5		
1	Bat	Perimyotis subflavus	Tri-colored Bat	G5	S5		
1	Bird	Ammodramus leconteii	LeConte's Sparrow	G4	S1N		
1	Bird	Anas rubripes	American Black Duck	G5	S3S4N		
1	Bird	Bonasa umbellus	Ruffed Grouse	G5	S4		
1	Bird	Calidris pusilla	Semipalmated Sandpiper	G5	S4N		
1	Bird	Cardellina canadensis	Canada Warbler	G5	S3B, S4N		
1	Bird	Chaetura pelagica	Chimney Swift	G5	S5		
1	Bird	Chordeiles minor	Common Nighthawk	G5	S4		
1	Bird	Colinus virginianus	Northern Bobwhite	G5	S2S3	(PS)	
1	Bird	Setophaga fusca	Blackburnian Warbler	G5	S3B, S4N		
1	Bird	Empidonax traillii	Willow Flycatcher	G5	S2S3	(PS)	
1	Bird	Euphagus carolinus	Rusty Blackbird	G5	S4N		
1	Bird	Gallinula galeata	Common Gallinule	G5	S1B	No Status	D
1	Bird	Icteria virens	Yellow-breasted Chat	G5	S4		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
1	Bird	Nycticorax nycticorax	Black-crowned Night-heron	G5	S2S3B		
1	Bird	Porphyrula martinica	Purple Gallinule	G5	S1B		
1	Bird	Rallus limicola	Virginia Rail	G5	S1B, S3N		
1	Bird	Sturnella magna	Eastern Meadowlark	G5	S5		
1	Bivalve	Actinonaias ligamentina	Mucket	G5	S4		
1	Bivalve	Anodontoides denigratus	Cumberland Papershell	G1	SSYN	MC	
1	Bivalve	Lampsilis siliquoidea	Fatmucket	G5	S2		
1	Bivalve	Lasmigona sp. 1 cf. holstonia	Barrens Bankclimber	GNR	S1		
1	Bivalve	Pleurobema chattanoogaense	Painted Clubshell	G1Q	S1?		
1	Bivalve	Simpsonaias ambigua	Salamander Mussel	G3	S1		
1	Bivalve	Venustaconcha sima	(a mussel)	G?	S?		
1	Bivalve	Villosa iris	Rainbow	G5	S5		
1	Bivalve	Villosa vanuxemensis	Mountain Creekshell	G4	S4		
1	Crustacean	Acanthocyclops parasensitivus	(a copepod)	G2	S?		
1	Crustacean	Bactrurus undescribed sp.	groundwater amphipod	G1	S?		
1	Crustacean	Bryocamptus (Limocamptus) sp.	copepods	G1	S?		
1	Crustacean	Caecidotea bicrenata	(a cave obligate isopod)	G5	SR		
1	Crustacean	Caecidotea bicrenata bicrenata	(a cave obligate isopod)	G3G4T3T4	SR		
1	Crustacean	Caecidotea bicrenata whitei	(a cave obligate isopod)	G3G4T3T4	S1?		
1	Crustacean	Caecidotea richardsonae	Tennessee Valley Cave Isopod	G3G5	SR		
1	Crustacean	Caecidotea sp.	cave isopods	G?	S?		
1	Crustacean	Cambarus clivosus	Short Mountain Crayfish	G2	S2		
1	Crustacean	Cambarus sp?	Obed Crayfish	G1Q	S1?		
1	Crustacean	Cambarus stockeri	Cocoa Crayfish	GNR	S1S2		
1	Crustacean	Cambarus tenebrosus	Cavespring Crayfish	G4	S?		
1	Crustacean	Crangonyx antennatus	Appalachian cave amphipod	G4	S?		
1	Crustacean	Crangonyx sp.	amphipods	G?	S?		
1	Crustacean	Dactylocythere steevesi	(a cave obligate shrimp)	G4	S2S3		
1	Crustacean	Diacyclops nearticus	Nearctic copepod	G3G4	S?		
1	Crustacean	Gammarus minus	Lesser spring amphipod	G5	S?		
1	Crustacean	Haplophthalmus danicus	(a terrestrial cave isopod)	G?	S?		
1	Crustacean	Itocyclops undescribed sp.	cave copepods	G1	S?		
1	Crustacean	Megacyclops donnaldsoni	Donnaldson’s cave copepod	G1	S?		
1	Crustacean	Miktoniscus medcofi	Medcof’s terrestrial isopod	G4	S?		
1	Crustacean	Orconectes barri	Cumberland Plateau Cave Crayfish	G2	S?		
1	Crustacean	Orconectes taylori	Crescent Crayfish	G2	S2		
1	Crustacean	Pseudocandona jeanneli	Jeannel's Cave Ostracod	G1G2	S?		
1	Crustacean	Pseudocandona sp.	groundwater ostracods	G1G2	S?		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
1	Crustacean	Sagittocythere barri	Ectocommensal Ostracod	G5	S3		
1	Crustacean	Stygobromus exilis	Central Kentucky Cave Obligate	G5	SR		
1	Crustacean	Stygobromus mackini	Southwestern Virginia Cave Amphipod	G5	SR		
1	Crustacean	Stygobromus sp.	cave amphipods	G?	S?		
1	Crustacean	Stygobromus sp. 3	Bosnak's cave amphipod	G2	S?		
1	Crustacean	Stygobromus sp. 34	(a cave obligate amphipod)	G1G2	S1S2		
1	Crustacean	Stygobromus sp. 4	Southern cave amphipod	G3	S?		
1	Crustacean	Triconiscus pusillus	terrestrial isopod	EX	S?		
1	Fish	Anguilla rostrata	American Eel	G5	S3		
1	Fish	Etheostoma luteovinctum	Redband Darter	G4	S4		D
1	Fish	Etheostoma maydeni	Redlips Darter	G2G3	S2S3		T
1	Fish	Etheostoma obeyense	Barcheek Darter	G4	S3		
1	Fish	Etheostoma tuscumbia	Tuscumbia Darter	G2	SX		D
1	Fish	Hybognathus placitus	Plains Minnow	G4	S1		D
1	Fish	Ichthyomyzon unicuspis	Silver Lamprey	G5	S2		D
1	Fish	Macrhybopsis sp. 1	Coosa Chub	G3G4	S1		
1	Fish	Moxostoma lacerum	Harelip Sucker	GX	SX		D
1	Fish	Moxostoma sp. 2	Sicklefin Redhorse	G2Q	S?	C	
1	Fish	Notropis dorsalis	Bigmouth Shiner	G5	S1		D
1	Fish	Percina williamsi	Sickle Darter	G2	S2		T
1	Fish	Salvelinus fontinalis	Brook Trout	G5	S3		
1	Gastropod	Carychium exile	Ice Thorn	G5	S?		
1	Gastropod	Glyphyalinia sp.	terrestrial snails	G1	S?		
1	Gastropod	Glyphyalinia sp.	terrestrial snails	G1	S?		
1	Gastropod	Glyphyalinia sp.	terrestrial snails	G?	S?		
1	Gastropod	Glyphyalinia specus	Hollow Glyph	G3	S4		
1	Gastropod	Glyphyalinia wheatleyi	Wheatley's glyph	G4	S?		
1	Gastropod	Helicodiscus barri	Raccoon Coil	G2G4	S3S4		
1	Gastropod	Helicodiscus multidens	Twilight Coil	G2	S3		
1	Gastropod	Helicodiscus sp.	terrestrial snails	G?	S?		
1	Gastropod	Lithasia curta	Knobby Rocksnail	G1	SX		
1	Gastropod	Marstonia scalariformis	Moss Pyrg	G1	SX		
1	Gastropod	Pleurocera alveare	Rugged Hornsnail	G3	S2	MC	
1	Reptile	Clonophis kirtlandii	Kirtlands Snake	G2	S1		
1	Reptile	Thamnophis proximus	Western Ribbonsnake	G5	S4S5		
2	Arachnid	Achaearanea porteri	Porter's cave spider	G4	S?		
2	Arachnid	Agyneta sp.	Trussell Cave Sheet-web Spider	G1	S?		
2	Arachnid	Anthrobia mammouthia	(a cave obligate spider)	G5	S1		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
2	Arachnid	Antrodiaetus sp.	(a foldingdoor trap-door spider)	G?	S?		
2	Arachnid	Apochthonius minor	(a pseudoscorpion)	G1	S?		
2	Arachnid	Apochthonius sp.	(a pseudoscorpion)	G1	S?		
2	Arachnid	Bathyphantes albiventris	(a sheet-web spider)	G4	S?		
2	Arachnid	Bathyphantes pallidus	Pallid Sheet-web Spider	G5	S?		
2	Arachnid	Bishopella sp. Probably laciniosa	harvestman	G?	S?		
2	Arachnid	Calymmaria persica	Cave-loving funnel-web spider	G4	S?		
2	Arachnid	Cicurina breviaria	funnel-web spider	G4	S?		
2	Arachnid	Cicurina placida	funnel-web spider	G4	S?		
2	Arachnid	Coras taugynus	funnel-web spider	G3G4	S?		
2	Arachnid	Eidmanella pallida	Pallid cave spider	G5	S?		
2	Arachnid	Erebomaster sp.	harvestmen	G?	S?		
2	Arachnid	Hesperonemastoma sp.	harvestmen	G?	S?		
2	Arachnid	Kleptochthonius sp.	Sells cave pseudoscorpion	G1	S?		
2	Arachnid	Kleptochthonius sp.	pseudoscorpions	G1	S?		
2	Arachnid	Kleptochthonius sp.	Round Cove cave pseudoscorpion	G1	S?		
2	Arachnid	Kleptochthonius undescribed sp.	cave pseudoscorpions	G1	S?		
2	Arachnid	Liocranoides archeri	Archer's two-clawed spider	G2	S?		
2	Arachnid	Liocranoides coylei	Coyle's tengellid spider	G3	S?		
2	Arachnid	Liocranoides gertschi	Gertsch's tengellid spider	G3	S?		
2	Arachnid	Liocranoides sp.	Two-clawed spider	G2	S?		
2	Arachnid	Liocranoides tennesseensis	Tennessee two-clawed spider	G2	S?		
2	Arachnid	Liocranoides unicolor	(a cave obligate spider)	G5	S?		
2	Arachnid	Macrocheles sp. 1	mite	G?	S?		
2	Arachnid	Macrocheles sp. 2	mite	G?	S?		
2	Arachnid	Macrocheles sp. 3	mite	G?	S?		
2	Arachnid	Maymena ambita	Minute cave spider	G3	S?		
2	Arachnid	Meta ovalis	American cave orb weaver	G5	S?		
2	Arachnid	Microcreagris nickajackensis	Nickajack cave pseudoscorpion	G1	S?		
2	Arachnid	Nemasatosoma sp.	harvestmen	G?	S?		
2	Arachnid	Nesticus barri	(a cave obligate spider)	G3	S3		
2	Arachnid	Nesticus pecki	Peck's cave spider	G1	S?		
2	Arachnid	Oreonetides sp.	cave sheet-web spiders	G1	S?		
2	Arachnid	Phalangodes sp.	cave harvestmen	G2	S?		
2	Arachnid	Phanetta subterranea	Subterranean sheet-web spider	G5	S?		
2	Arachnid	Porrhomma cavernicola	Appalachian Cave Spider	G5	S1?		
2	Arachnid	Rhagidia species s. latu	(a mite)	G?	S?		
2	Arachnid	Tolus sp.	(a harvestman)	G?	S?		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
2	Arachnid	Tyrannochthonius halopotamus	Salt River cave pseudoscorpion	G1	S?		
2	Flatworm	Sphalloplana percoeca	(a cave obligate planarian)	G5	S3?		
2	Flatworm	Sphalloplana sp.	(flatworms)	G?	S?		
2	Insect	Acrotrichis lucidula	Feather-winged Beetle	G2G3	SE1?		
2	Insect	Aleochara lucifuga	(a rove beetle)	G4	S?		
2	Insect	Aleochara sp.	(a rove beetle)	G?	S?		
2	Insect	Aloconota insecta	(a rove beetle)	G4	S?		
2	Insect	Aloconota laurentiana	(a rove beetle)	G4	S?		
2	Insect	Anillinus longiceps	(a cave obligate beetle)	G?	S?		
2	Insect	Anillinus sp.	(a ground beetle)	G?	S?		
2	Insect	Anillinus sp.	(undescribed ground beetle)	G1	S?		
2	Insect	Arianops pecki	(a cave ant beetle)	G?	S?		
2	Insect	Arianops sp.	(cave ant beetles)	G1	S?		
2	Insect	Arianops stygica	(a cave ant beetle)	G1	S?		
2	Insect	Arrhopalites benitus	(a springtail)	G4	S?		
2	Insect	Arrhopalites caecus	(a springtail)	G4	S?		
2	Insect	Arrhopalites marshalli	Marshall's Cave Springtail	G2	S?		
2	Insect	Arrhopalites pavo	(a cave springtail)	G2	S?		
2	Insect	Arrhopalites pygmaeus	(a springtail)	G4	S?		
2	Insect	Arrhopalites sp. 2 near bimus	(undescribed cave springtail)	G1	S?		
2	Insect	Arrhopalites sp. 3 near benitus	(undescribed cave springtail)	G1	S?		
2	Insect	Arrhopalites sp. 4	(undescribed cave springtail)	G1	S1		
2	Insect	Arrhopalites sp. 4 near lacuna	(undescribed cave springtail)	G1	S?		
2	Insect	Atheta annexa	(a rove beetle)	G4	S?		
2	Insect	Atheta sp.	(a rove beetle)	G?	S?		
2	Insect	Atheta troglophila	(a troglophilic rove beetle)	G4	S?		
2	Insect	Atranus pubescens	(a ground beetle)	G4	S?		
2	Insect	Batriasymmodes spelaeus	(a cave obligate beetle)	G3G4	S2?		
2	Insect	Batrisodes sp.	ant beetles	G?	S?		
2	Insect	Batrisodes sp.	ant beetles	G?	S?		
2	Insect	Batrisodes specus	(a beetle)	G3G4	S?		
2	Insect	Bembidion lacunarium	ground beetle	G4	S?		
2	Insect	Catops gratiosus	round fungus beetle	G4	S?		
2	Insect	Ceratophysella denticulata	Toothed springtail	G4	S?		
2	Insect	Ceratophysella sp.	springtails	G?	S?		
2	Insect	Ceratophysella undescribed sp., denticulata group	springtail	G?	S?		
2	Insect	Ceuthophilus ensifer	cave cricket	G3	S?		
2	Insect	Ceuthophilus gracilipes vs. stygius	cave cricket	G4	S?		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
2	Insect	Ceuthophilus sp.	cave crickets	G?	S?		
2	Insect	Ceuthophilus stygius	cave cricket	G4	S?		
2	Insect	Desoria trispinata	Three-spined springtail	G4	S?		
2	Insect	Desoria truncata	Truncate springtail	G4?	S?		
2	Insect	Dissochaetus oblitus	round fungus beetle	G4	S?		
2	Insect	Euhadenoecus puteaus	cave cricket	G4	S?		
2	Insect	Folsomia candida	springtail	G4	S?		
2	Insect	Folsomia stella	Stellate springtail	G4	S?		
2	Insect	Hadenoecini sp.	cave crickets	G?	S?		
2	Insect	Hadenoecus barri	Barr’s cave cricket	G4	S?		
2	Insect	Hadenoecus jonesi	Jones' cave cricket	G3G4	S?		
2	Insect	Hypogastrura antra	springtail	G?	S?		
2	Insect	Hypogastrura sp. Denticulata group	springtail	G?	S?		
2	Insect	Hypogastrura undescribed sp.	springtails	G?	S?		
2	Insect	Lesteva pallipes	rove beetle	G4	S?		
2	Insect	Litocampa barryi	(a bristletail)	G?	S?		
2	Insect	Litocampa cherokeensis	(a bristletail)	G?	S?		
2	Insect	Litocampa cookei	Cooke’s Cave Dipluran	G3	S?		
2	Insect	Litocampa davisi	(a bristletail)	G?	S?		
2	Insect	Litocampa inexspectata	(a bristletail)	G?	S?		
2	Insect	Litocampa sp.	(bristletails)	G?	S?		
2	Insect	Litocampa sp. 1	undescribed cave dipluran	G1	S?		
2	Insect	Litocampa valentinei	(a cave obligate bristletail)	G5	S2		
2	Insect	Macrocera nobilis	fungus gnat	G4	S?		
2	Insect	Megaselia cavernicola	cave hump-backed fly	G5	S?		
2	Insect	Nemadus horni	small carrion beetle	G4	S?		
2	Insect	Onychiurus pseudofimetarius	springtail	G4	S?		
2	Insect	Onychiurus reluctus	springtail	G4	S?		
2	Insect	Onychiurus sp.	springtails	G?	S?		
2	Insect	Platynus tenuicollis	ground beetle	G4	S?		
2	Insect	Prionochaeta opaca	small carrion beetle	G4	S?		
2	Insect	Pseudanophthalmus beakleyi	(a cave obligate beetle)	G3G4	S3		
2	Insect	Pseudanophthalmus cerberus cerberus	(a cave obligate beetle)	G3G4T3T4	S?		
2	Insect	Pseudanophthalmus intermedius	Intermediate cave beetle	G2	S?		
2	Insect	Pseudanophthalmus princeps	(a cave obligate beetle)	G1G2	S?		S1S2
2	Insect	Pseudanophthalmus robustus	(a cave obligate beetle)	G3G4	S3		
2	Insect	Pseudanophthalmus sp.	Keyhole cave beetle	G1	S?		
2	Insect	Pseudanophthalmus sp.	cave ground beetles	G1	S?		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
2	Insect	Pseudanophthalmus sp.	(a cave obligate beetle)	G?	S?		
2	Insect	Pseudanophthalmus sp.	Aaron Tolletts cave beetle	G1	S?		
2	Insect	Pseudanophthalmus sp.	Wilmoth cave beetle	G1	S?		
2	Insect	Pseudanophthalmus sp.	Caney Hollow cave ground beetle	G1	S?		
2	Insect	Pseudanophthalmus sp.	Sells cave ground beetle	G2	S?		
2	Insect	Pseudanophthalmus sp.	Baker cave beetle	G1	S?		
2	Insect	Pseudanophthalmus sp. 36	Millers Cave Beetle	GNR	S1?		
2	Insect	Pseudanophthalmus sp. 36	Gunters Cave Beetle	G?	S?		S1?
2	Insect	Pseudanophthalmus sp. A englehardti group	(a cave obligate beetle)	G?	S?		
2	Insect	Pseudanophthalmus sp. B englehardti group	(a cave obligate beetle)	G?	S?		
2	Insect	Pseudanophthalmus sp. B jonesi group	(a cave obligate beetle)	G?	S?		
2	Insect	Pseudosinella aera	(a cave springtail)	G?	S?		
2	Insect	Pseudosinella alba	White springtail	G4	S?		
2	Insect	Pseudosinella cf. christianseni	(a cave springtail)	G?	S?		
2	Insect	Pseudosinella cf. gisini	(a cave springtail)	G?	S?		
2	Insect	Pseudosinella cf. nata	(a cave springtail)	G?	S?		
2	Insect	Pseudosinella collina	(a springtail)	G3G4	S?		
2	Insect	Pseudosinella pecki	Peck's cave springtail	G2	S?		
2	Insect	Pseudosinella sp.	(a springtail)	G?	S?		
2	Insect	Pseudosinella undescribed sp. near espanita	cave springtail	G1	S?		
2	Insect	Psyllipsocus ramburi	(a cave barklice)	G4	S?		
2	Insect	Ptomaphagus hatchi	Hatch's cave fungus beetle	G3	S3?		
2	Insect	Rhadine caudata	ground beetle	G4	S?		
2	Insect	Sciara sp.	fungus gnats	G?	S?		
2	Insect	Sensillanura barberi	Barber's Springtail	G4	S?		
2	Insect	Sinella cavernarum	(a springtail)	G5	S3		
2	Insect	Speleochus steevesi	(a cave obligate beetle)	G?	S?		
2	Insect	Speleochus undescribed species	(a beetle)	G?	S?		
2	Insect	Spelobia tenebrarum	Cave dung fly	G5	S?		
2	Insect	Stenoponia americana	flea	G5	S?		
2	Insect	Subterrochus ferus	cave ant beetle	G1G2	S?		
2	Insect	Subterrochus sp.	cave ant beetles	G1	S?		
2	Insect	Tomocerus bidentatus	Two-toothed springtail	G4	S?		
2	Insect	Tomocerus dubius	springtail	G4	S?		
2	Insect	Tomocerus flavescens	Golden springtail	G5	S?		
2	Insect	Tomocerus missus	Relict cave springtail	G4	S?		
2	Insect	Tomocerus sp.	springtails	G1	S?		
2	Insect	Typhlogastrura christianseni	Christiansen's cave springtail	G1	S?		

SWAP Tier	Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
2	Insect	Undetermined species	sepsid Black scavenger fly	G?	S?		
2	Millipede	Ameractis satis	(a cave obligate milliped)	G4	S?		
2	Millipede	Cambala sp.	millipeds	G?	S?		
2	Millipede	Chaetaspis debilis	(a cave obligate millipede)	G?	S?		
2	Millipede	Chaetaspis sp.	cave millipeds	G?	S?		
2	Millipede	Delophon holti	Hamblen County Millipede	GNR	S1		
2	Millipede	Ophyiulus pilosus	(a millipede)	G?	S?		
2	Millipede	Pseudotremia eburnea	(a cave obligate millipede)	G2G4	S?		
2	Millipede	Pseudotremia minos	Russell cave milliped	G1	S?		
2	Millipede	Pseudotremia n. sp.	(a cave obligate millipede)	G?	S?		
2	Millipede	Pseudotremia nodosa	(a cave obligate millipede)	G4	S2S3		
2	Millipede	Pseudotremia sp.	cave millipeds	G?	S?		
2	Millipede	Pseudotremia sp. 10	Baker cave milliped	G1	S?		
2	Millipede	Pseudotremia sp. 5	Three Forks cave milliped	G1	S?		
2	Millipede	Pseudotremia sp. 6	Slippery slit cave milliped	G1	S?		
2	Millipede	Pseudotremia sp. 7	Barr's cave milliped	G?	S?		
2	Millipede	Pseudotremia sp. 8	Skylight cave milliped	G1	S?		
2	Millipede	Pseudotremia sp. 9	Holliday's cave milliped	G1	S?		
2	Millipede	Pseudotremia undescribed sp.	Hoffman's cave milliped	G1	S?		
2	Millipede	Pseudotremia undescribed sp.	Shear's cave milliped	G1	S?		
2	Millipede	Scoterpes blountensis	(a cave obligate millipede)	G?	S?		
2	Millipede	Scoterpes hesperus	(a cave obligate millipede)	G?	S?		
2	Millipede	Scoterpes jackdanieli	(a cave obligate millipede)	G?	S?		
2	Millipede	Scoterpes musicarustica	(a cave obligate millipede)	G?	S?		
2	Millipede	Scoterpes sp.	cave millipeds	G1	S?		
2	Millipede	Scoterpes sp.	cave millipeds	G2	S?		
2	Millipede	Scoterpes sp.	cave millipeds	G?	S?		
2	Millipede	Scoterpes tricorner	(a cave obligate millipede)	G?	S?		
2	Millipede	Scoterpes undescribed sp.	(a cave milliped)	G2G3	S?		
3	Bat	Myotis septentrionalis	Northern Myotis	G4	S4	LT	
3	Bivalve	Epioblasma metastriata	Upland Combshell	GH	SH	LE	E
3	Fish	Etheostoma lemniscatum	Tuxedo Darter	G1	S1	LE	E
3	Fish	Etheostoma marmorpinnum	Marbled Darter	G1	S1	LE	E
3	Fish	Etheostoma sitikuense	Citico Darter	G1	S1	LE, XN	E

Table 3: 2015 Removals from the TN State Wildlife Action Plan Species of Greatest Conservation Need List.

Species were removed from the list according to expert opinion regarding regional distributions, occurrence and population status within Tennessee, and global conservation status.

Taxa Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	2005 SWAP Tier
Bird	Anhinga anhinga	Anhinga	G5	S1B		D	1
Bird	Chondestes grammacus	Lark Sparrow	G5	S1B		T	1
Bird	Coccyzus americanus	Yellow-billed Cuckoo	G5	S4S5	(PS)		1
Bird	Contopus virens	Eastern Wood-pewee	G5	S5			1
Bird	Corvus corax	Common Raven	G5	S2		T	1
Bird	Setophaga virens	Black-throated Green Warbler	G5	S5			1
Bird	Elanoides forficatus	Swallow-tailed Kite	G5	SAN	MC		1
Bird	Empidonax virescens	Acadian Flycatcher	G5	S5			1
Bird	Parula americana	Northern Parula	G5	S5			1
Bird	Passerculus sandwichensis	Savannah Sparrow	G5	S1B, S4N			1
Bird	Pooecetes gramineus	Vesper Sparrow	G5	S1B, S4N		D	1
Bird	Regulus satrapa	Golden-crowned Kinglet	G5	S3B, S4N			1
Bird	Sitta canadensis	Red-breasted Nuthatch	G5	S2B, S4N			1
Bird	Spiza americana	Dickcissel	G5	S4			1
Bird	Tyrannus forficatus	Scissor-tailed Flycatcher	G5	S1B, SAN			1
Bird	Vireo flavifrons	Yellow-throated Vireo	G5	S4			1
Bird	Vireo griseus	White-eyed Vireo	G5	S4			1
Bird	Wilsonia citrina	Hooded Warbler	G5	S4			1
Mammal	Lepus americanus	Snowshoe Hare	G5	SR			3
Reptile	Apalone spinifera	Spiny Softshell Turtle	G5	S5			1

Table 4: GCN bird species list in taxonomic order

Common Name	Scientific Name	S_Rank TN[1]
Northern Bobwhite	Colinus virginianus	S2S3
American Bittern	Botaurus lentiginosus	S1
Least Bittern	Ixobrychus exilis	S2B
Great Egret	Ardea alba	S2B, S3N
Little Blue Heron	Egretta caerulea	S2B, S3N
Black-crowned Night-heron	Nycticorax nycticorax	S2S3B
Golden Eagle	Aquila chrysaetos	S1
Mississippi Kite	Ictinia mississippiensis	S2S3
Northern Harrier	Circus cyaneus	S4N
Sharp-shinned Hawk	Accipiter striatus	S3B, S4N
Bald Eagle	Haliaeetus leucocephalus	S3
King Rail	Rallus elegans	S2
Virginia Rail	Rallus limicola	S1B, S3N
Whooping Crane	Grus americana	S?
American Golden-Plover	Pluvialis dominica	S3N
Piping Plover	Charadrius melodus melodus	S2N
Upland Sandpiper	Bartramia longicauda	SXB?
Whimbrel	Numenius phaeopus	S?
Hudsonian Godwit	Limosa haemastica	S?
Marbled Godwit	Limosa fedoa	S?
Red Knot	Calidris canutus	S2N
Stilt Sandpiper	Calidris himantopus	S3N
Buff-breasted Sandpiper	Tryngites subruficollis	S3N
Semipalmated Sandpiper	Calidris pusilla	S4N

Western Sandpiper	Calidris mauri	S4N
American Woodcock	Scolopax minor	S4B
Interior Least Tern	Sternula antillarum athalassos	S2S3B
Barn Owl	Tyto alba	S3
Short-eared Owl	Asio flammeus	S3N
Northern Saw-whet Owl	Aegolius acadicus	S1
Chuck-will's-widow	Caprimulgus carolinensis	S3S4
Eastern Whip-poor-will	Caprimulgus vociferus	S3S4
Chimney Swift	Chaetura pelagica	S5
Red-headed Woodpecker	Melanerpes erythrocephalus	S4
Yellow-bellied Sapsucker	Sphyrapicus varius	S1B, S4N
Peregrine Falcon	Falco peregrinus	S1B
Olive-sided Flycatcher	Contopus cooperi	S1
Alder Flycatcher	Empidonax alnorum	S1
Least Flycatcher	Empidonax minimus	S3
Loggerhead Shrike	Lanius ludovicianus	S1B, S2N
Bell's Vireo	Vireo bellii	S1B
Bank Swallow	Riparia riparia	S3
Black-capped Chickadee	Poecile atricapillus	S2B
Brown-headed Nuthatch	Sitta pusilla	S2B
Brown Creeper	Certhia americana	S2B, S4N
Winter Wren	Troglodytes troglodytes	S3B, S4N
Sedge Wren	Cistothorus platensis	S3N, SPB
Bewick's Wren	Thryomanes bewickii	S1
Wood Thrush	Hylocichla mustelina	S4

Worm-eating Warbler	Helmitheros vermivorum	S4
Louisiana Waterthrush	Parkesia motacilla	S4
Blue-winged Warbler	Vermivora cyanoptera	S4
Golden-winged Warbler	Vermivora chrysoptera	S3B
Prothonotary Warbler	Protonotaria citrea	S4
Swainson's Warbler	Limnothlypis swainsonii	S3
Kentucky Warbler	Geothlypis Formosa	S4
Cerulean Warbler	Setophaga cerulea	S3B
Blackburnian Warbler	Setophaga fusca	S3B, S4N
Black-throated Blue Warbler	Setophaga caerulescens	S4
Yellow-throated Warbler	Setophaga dominica	S4
Prairie Warbler	Setophaga discolor	S3S4
Canada Warbler	Cardellina canadensis	S3B, S4N
Yellow-breasted Chat	Icteria virens	S4
Bachman's Sparrow	Peucaea aestivalis	S1B
Grasshopper Sparrow	Ammodramus savannarum	S4
Henslow's Sparrow	Ammodramus henslowii	S1B
LeConte's Sparrow	Ammodramus leconteii	S1N
Painted Bunting	Passerina ciris	S2
Eastern Meadowlark	Sturnella magna	S5
Rusty Blackbird	Euphagus carolinus	S4N
Orchard Oriole	Icterus spurius	S4

[1]**S_Rank_tn**		
State Conservation Status describing the species' abundance within Tennessee (TNDH		
S1 - Extremely rare and critically imperiled.		
S2 - Very rare and imperiled.		
S3 - Vulnerable.		
S4 - Uncommon but not rare, and apparently secure within the state, but with cause f		
factors.		
S5 - Demonstrably common, widespread, and secure in the state.		
_N - Conservation status refers to the non-breeding population.		
_B - Conservation status refers to the breeding population.		
Without N or B = year round and all occurrences		

Appendix C, Table 5. GCN wildlife and plant species closely associated with ridgeline areas in the North Cumberland Wildlife Management Area and Lands Unsuitable for Mining Petition boundary. GCN species located downstream of ridgeline areas are denoted with an asterisk (*).

Taxanomic Group	Scientific Name	Common Name
Amphibian	Aneides aeneus	Green Salamander
Amphibian	Cryptobranchus alleganiensis	Hellbender
Amphibian	Desmognathus abditus	Cumberland Dusky Salamander
Amphibian	Desmognathus welteri	Black Mountain Salamander
Amphibian	Hemidactylium scutatum	Four-toed Salamander
Amphibian	Plethodon richmondi	Ravine Salamander
Amphibian	Pseudacris brachyphona	Mountain Chorus Frog
Amphibian	Pseudotriton montanus	Mud Salamander
Amphibian	Siren intermedia	Lesser Siren
Bat	Corynorhinus rafinesquii	Rafinesque's Big-eared Bat
Bat	Myotis grisescens	Gray Bat
Bat	Myotis leibii	Eastern Small-footed Bat
Bat	Myotis lucifugus	Little Brown Bat
Bat	Myotis septentrionalis	Northern Myotis
Bat	Myotis sodalis	Indiana Bat
Bat	Perimyotis subflavus	Tri-colored Bat
Bird	Accipiter striatus	Sharp-shinned Hawk
Bird	Ammodramus henslowii	Henslow's Sparrow
Bird	Ammodramus savannarum	Grasshopper Sparrow
Bird	Anas rubripes	American Black Duck
Bird	Aquila chrysaetos	Golden Eagle
Bird	Ardea alba	Great Egret
Bird	Bonasa umbellus	Ruffed Grouse
Bird	Botaurus lentiginosus	American Bittern
Bird	Caprimulgus carolinensis	Chuck-will's-widow
Bird	Caprimulgus vociferus	Whip-poor-will
Bird	Cardellina canadensis	Canada Warbler
Bird	Certhia americana	Brown Creeper
Bird	Chaetura pelagica	Chimney Swift

Taxanomic Group	Scientific Name	Common Name
Bird	Chordeiles minor	Common Nighthawk
Bird	Circus cyaneus	Northern Harrier
Bird	Colinus virginianus	Northern Bobwhite
Bird	Contopus cooperi	Olive-sided Flycatcher
Bird	Egretta caerulea	Little Blue Heron
Bird	Empidonax minimus	Least Flycatcher
Bird	Empidonax traillii	Willow Flycatcher
Bird	Euphagus carolinus	Rusty Blackbird
Bird	Falco peregrinus	Peregrine Falcon
Bird	Geothlypis formosa	Kentucky Warbler
Bird	Haliaeetus leucocephalus	Bald Eagle
Bird	Helmitheros vermivorum	Worm-eating Warbler
Bird	Hylocichla mustelina	Wood Thrush
Bird	Icteria virens	Yellow-breasted Chat
Bird	Icterus spurius	Orchard Oriole
Bird	Limnothlypis swainsonii	Swainson's Warbler
Bird	Melanerpes erythrocephalus	Red-headed Woodpecker
Bird	Nycticorax nycticorax	Black-crowned Night-heron
Bird	Parkesia motacilla	Louisiana Waterthrush
Bird	Protonotaria citrea	Prothonotary Warbler
Bird	Rallus elegans	King Rail
Bird	Riparia riparia	Bank Swallow
Bird	Scolopax minor	American Woodcock
Bird	Setophaga caerulescens	Black-throated Blue Warbler
Bird	Setophaga cerulea	Cerulean Warbler
Bird	Setophaga discolor	Prairie Warbler
Bird	Setophaga dominica	Yellow-throated Warbler
Bird	Setophaga fusca	Blackburnian Warbler
Bird	Sitta pusilla	Brown-headed Nuthatch
Bird	Sphyrapicus varius	Yellow-bellied Sapsucker
Bird	Sturnella magna	Eastern Meadowlark
Bird	Troglodytes troglodytes	Winter Wren
Bird	Tyto alba	Barn Owl
Bird	Vermivora chrysoptera	Golden-winged Warbler

Taxanomic Group	Scientific Name	Common Name
Bird	Vermivora cyanoptera	Blue-winged Warbler
Bivalve	Actinonaias ligamentina*	Mucket
Bivalve	Actinonaias pectorosa*	Pheasantshell
Bivalve	Alasmidonta atropurpurea*	Cumberland Elktoe
Bivalve	Alasmidonta marginata*	Elktoe
Bivalve	Alasmidonta viridis*	Slippershell Mussel
Bivalve	Anodontoides denigratus*	Cumberland Papershell
Bivalve	Epioblasma brevidens*	Cumberlandian Combshell
Bivalve	Epioblasma capsaeformis*	Oyster Mussel
Bivalve	Epioblasma florentina walkeri*	Tan Riffleshell
Bivalve	Fusconaia cuneolus*	Finerayed Pigtoe
Bivalve	Lampsilis siliquoidea*	Fatmucket
Bivalve	Lampsilis virescens	Alabama Lampmussel
Bivalve	Lasmigona holstonia	Tennessee Heelsplitter
Bivalve	Ligumia recta*	Black Sandshell
Bivalve	Medionidus conradicus*	Cumberland Moccasinshell
Bivalve	Obovaria subrotunda*	Round Hickorynut
Bivalve	Pegias fabula*	Littlewing Pearlymussel
Bivalve	Pleurobema clava*	Clubshell
Bivalve	Pleurobema oviforme	Tennessee Clubshell
Bivalve	Pleurobema rubrum*	Pyramid Pigtoe
Bivalve	Pleurobema sintoxia*	Round Pigtoe
Bivalve	Pleuronaia barnesiana*	Tennessee Pigtoe
Bivalve	Ptychobranchus subtentum*	Fluted Kidneyshell
Bivalve	Strophitus undulatus*	Creeper
Bivalve	Villosa iris*	Rainbow
Bivalve	Villosa lienosa*	Little Spectaclecase
Bivalve	Villosa perpurpurea	Purple Bean
Bivalve	Villosa taeniata*	Painted Creekshell
Bivalve	Villosa trabalis*	Cumberland Bean
Crustacean	Cambarus crinipes*	Hairyfoot Crayfish
Crustacean	Cambarus obeyensis	Obey Crayfish
Crustacean	Cambarus sp.	Obed Crayfish
Crustacean	Cambarus sp. 1	Emory River Crayfish

Taxanomic Group	Scientific Name	Common Name
Fish	Acipenser fulvescens*	Lake Sturgeon
Fish	Chrosomus cumberlandensis	Blackside Dace
Fish	Crystallaria cincotta*	Diamond Darter
Fish	Cycleptus elongatus*	Blue sucker
Fish	Erimonax monachus*	Spotfin Chub
Fish	Erimystax dissimilis*	Streamline Chub
Fish	Etheostoma acuticeps*	Sharphead Darter
Fish	Etheostoma baileyi	Emerald Darter
Fish	Etheostoma cinereum*	Ashy Darter
Fish	Etheostoma lemniscatum*	Tuxedo Darter
Fish	Etheostoma luteovinctum*	Redband Darter
Fish	Etheostoma maydeni	Redlips Darter
Fish	Etheostoma percnurum*	Duskytail Darter
Fish	Etheostoma sagitta	Arrow Darter
Fish	Etheostoma striatulum*	Striated Darter
Fish	Etheostoma susanae*	Cumberland Darter
Fish	Etheostoma tippecanoe*	Tippecanoe Darter
Fish	Etheostoma vulneratum*	Wounded Darter
Fish	Notropis buccatus	Silverjaw Minnow
Fish	Notropis rubellus	Rosyface Shiner
Fish	Noturus baileyi	Smoky Madtom
Fish	Noturus flavipinnis	Yellowfin Madtom
Fish	Percina aurantiaca*	Tangerine Darter
Fish	Percina macrocephala*	Longhead Darter
Fish	Percina squamata*	Olive Darter
Fish	Percina williamsi	Sickle Darter
Insect	Gomphus consanguis	Cherokee Clubtail
Mammal	Martes pennanti	Fisher
Mammal	Napaeozapus insignis	Woodland Jumping Mouse
Mammal	Neotoma floridana illinoensis	Eastern Woodrat
Mammal	Neotoma magister	Allegheny Woodrat
Mammal	Ochrotomys nuttalli	Golden Mouse
Mammal	Parascalops breweri	Hairy-tailed Mole
Mammal	Sorex cinereus	Cinereus Shrew

Taxanomic Group	Scientific Name	Common Name
Mammal	Sorex fumeus	Smoky Shrew
Mammal	Sorex hoyi	American Pygmy Shrew
Mammal	Sorex longirostris	Southeastern Shrew
Mammal	Spilogale putorius	Eastern Spotted Skunk
Mammal	Synaptomys cooperi	Southern Bog Lemming
Mammal	Zapus hudsonius	Meadow Jumping Mouse
Plant	Aureolaria patula	Spreading False-foxglove
Plant	Bryoxiphium norvegicum	Sword Moss
Plant	Corydalis sempervirens	Pale Corydalis
Plant	Cypripedium acaule	Pink Lady's-slipper
Plant	Juglans cinerea	Butternut
Plant	Lilium canadense	Canada Lily
Plant	Lonicera dioica	Mountain Honeysuckle
Plant	Melanthium woodii	Ozark Bunchflower
Plant	Panax quinquefolius	American Ginseng
Plant	Platanthera flava var. herbiola	Tubercled Rein Orchid
Plant	Silphium wasiotense	Kentucky Rosinweed
Reptile	Anolis carolinensis	Green Anole
Reptile	Crotalus horridus	Timber Rattlesnake
Reptile	Heterodon platirhinos	Eastern Hognosed Snake
Reptile	Terrapene carolina	Eastern Box Turtle

Tennessee State Wildlife Action Plan 2015

Appendix D - Habitat information for GCN species: Habitat classification hierarchies, descriptions of habitat ecological systems, and GCN species habitat preferences by ecoregion

Appendix D: Habitat information for GCN species. Habitat classification hierarchies, descriptions of habitat ecological systems, and GCN species habitat preferences by ecoregion.

Table 1. Habitat Classification Hierarchy, including list of ecological systems

Habitat Category	Habitat Class	Habitat Alliance	Habitat Group	Ecological Systems
Terrestrial	Natural	Forest and Woodland	Upland Deciduous Forest	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland, East Gulf Coastal Plain Northern Dry Upland Hardwood Forest, Southern Interior Low Plateau Dry-Mesic Oak Forest, Southern Ridge and Valley / Cumberland Dry Calcareous Forest, Allegheny-Cumberland Dry Oak Forest and Woodland, East Gulf Coastal Plain Northern Loess Bluff Forest, East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest, South-Central Interior / Upper Coastal Plain Flatwoods, East Gulf Coastal Plain Limestone Forest, South-Central Interior Mesophytic Forest, Southern and Central Appalachian Cove Forest, Southern Appalachian Oak Forest, Southern Appalachian Northern Hardwood Forest
			Upland Coniferous Forest	Southern Appalachian Low-Elevation Pine Forest, Southern Appalachian Montane Pine Forest and Woodland, Central and Southern Appalachian Spruce-Fir Forest
			Upland Mixed Forest	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest, Appalachian (Hemlock)-Northern Hardwood Forest
			Upland Mixed Woodland	Central Interior Highlands Dry Acidic Glade and Barrens, Appalachian Shale Barrens
		Savanna and Shrub-Steppe	Glade/Barrens	Central Interior Highlands Calcareous Glade and Barrens, Nashville Basin Limestone Glade and Woodland, Cumberland Sandstone Glade and Barrens, Ridge and Valley Calcareous Valley Bottom Glade and Woodland, Central Appalachian Alkaline Glade and Woodland, Southern and Central Appalachian Mafic Glade and Barrens
		Upland Grassland and Herbaceous	Prairie/Barrens	East Gulf Coastal Plain Jackson Plain Prairie and Barrens, East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland, Pennyroyal Karst Plain Prairie and Barrens, Western Highland Rim Prairie and Barrens, Eastern Highland Rim Prairie and Barrens, Cumberland Wet-Mesic Meadow and Savanna, Southern Ridge and Valley Patch Prairie
		Woody Wetlands and Riparian	Bald	Southern Appalachian Grass and Shrub Bald
			Forested Bottomland Floodplain	Mississippi River High Floodplain (Bottomland) Forest, Mississippi River Low Floodplain (Bottomland) Forest, Mississippi River Riparian Forest, East Gulf Coastal Plain Large River Floodplain Forest, East Gulf Coastal Plain Small Stream and River Floodplain Forest, Cumberland Riverscour
			Forested Seep/Bog/Swamp	East Gulf Coastal Plain Northern Seepage Swamp, Cumberland Seepage Forest, Southern and Central Appalachian Bog and Fen
			Forested Depression/Wet Flatwoods	Mississippi River Bottomland Depression, South-Central Interior / Upper Coastal Plain Wet Flatwoods, Central Interior Highlands and Appalachian Sinkhole and Depression Pond
		Herbaceous Wetland	Open Seep/Fen	Interior Low Plateau Seepage Fen, Southern Appalachian Seepage Wetland
		Mixed Upland and Wetland	Upland Riparian Zone/Floodplain	South-Central Interior Small Stream and Riparian, South-Central Interior Large Floodplain
		Sparsely Vegetated	Cliff/Talus	Central Interior Acidic Cliff and Talus, Central Interior Calcareous Cliff and Talus, Cumberland Acidic Cliff and Rockhouse, Southern Appalachian Spray Cliff, Southern Appalachian Montane Cliff and Talus, Southern Interior Calcareous Cliff

			Mountain Summit	Southern Appalachian Rocky Summit
			Karst Outcrop	Southern Interior Sinkhole Wall
	Semi-Natural	Forest and Woodland	Forest Plantation	Forest Plantation
			Urban/Suburban Managed Forest	Urban / Suburban Managed Forestland
		Savanna and Shrub-Steppe	Old Field/Successional	Old Field / Successional
		Upland Grassland and Herbaceous	Pasture	Pasture
			Cropland	Cropland
			Urban/Suburban Managed Grassland	Urban / Suburban Managed Grassland
		Woody Wetlands and Riparian	Converted/Altered Forested Wetland	Converted Wetland (Lacustrine, Riverine, and Palustrine)
		Sparsely Vegetated	Excavated Land	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)
	Non-Natural	Developed Land	Edifice/Other Man-Made Structure	Edifice / Other Man-made Structure
			Impervious Landscape	Developed Open Space
				Low, Medium, and High Intensity Developed
Aquatic	Natural	Riverine	Large River	Large River
			Medium River	Medium River
			Small River	Small River
			Creek/Headwater Stream	Creek / Headwater Stream
		Lacustrine	Lake/Oxbow	Lake
	Semi-Natural	Riverine	Channelized River/Stream	Channelized River / Stream
		Lacustrine	Reservoir/Excavated Pond	Reservoir
Subterranean	Natural	Karst	Cave/Sinkhole	Subterrestrial Environment
			Cave/Sinkhole	Subaquatic Environment
	Semi-Natural	Artificial Karst	Mine Shaft/Tunnel	Excavated Land (Mine Shaft / Rock Quarry / Tunnel)

Table 2. Habitat preference information for terrestrial GCN species.

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Acris gryllus (Southern Cricket Frog)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Amphibian	Acris gryllus (Southern Cricket Frog)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Amphibian	Acris gryllus (Southern Cricket Frog)	Mississippi River Riparian Forest	Suit					
Amphibian	Acris gryllus (Southern Cricket Frog)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Amphibian	Acris gryllus (Southern Cricket Frog)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Amphibian	Acris gryllus (Southern Cricket Frog)	East Gulf Coastal Plain Northern Seepage Swamp		Pref				
Amphibian	Acris gryllus (Southern Cricket Frog)	Mississippi River Bottomland Depression	Suit					
Amphibian	Acris gryllus (Southern Cricket Frog)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Amphibian	Acris gryllus (Southern Cricket Frog)	South-Central Interior Small Stream and Riparian		Suit				
Amphibian	Acris gryllus (Southern Cricket Frog)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Acris gryllus (Southern Cricket Frog)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Acris gryllus (Southern Cricket Frog)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Ambystoma barbouri (Streamside Salamander)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Amphibian	Ambystoma barbouri (Streamside Salamander)	South-Central Interior Mesophytic Forest			Suit			
Amphibian	Ambystoma barbouri (Streamside Salamander)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Amphibian	Ambystoma barbouri (Streamside Salamander)	Interior Low Plateau Seepage Fen			Suit			
Amphibian	Ambystoma barbouri (Streamside Salamander)	South-Central Interior Small Stream and Riparian			Pref			
Amphibian	Ambystoma barbouri (Streamside Salamander)	South-Central Interior Large Floodplain			Marg			
Amphibian	Ambystoma barbouri (Streamside Salamander)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Pref			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Limestone Forest		Marg				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Oak Forest					Suit	Suit
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Northern Hardwood Forest						Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Marg			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Appalachian Shale Barrens				Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg	Marg	Marg	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Nashville Basin Limestone Glade and Woodland			Marg			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Cumberland Sandstone Glade and Barrens				Marg		
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central Appalachian Alkaline Glade and Woodland					Marg	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Western Highland Rim Prairie and Barrens			Suit			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Eastern Highland Rim Prairie and Barrens			Suit			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Ridge and Valley Patch Prairie					Marg	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Grass and Shrub Bald						Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Mississippi River High Floodplain (Bottomland) Forest	Marg					
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Mississippi River Riparian Forest	Marg					
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Cumberland Riverscour				Marg		
Amphibian	Ambystoma texanum (Smallmouth Salamander)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Cumberland Seepage Forest				Marg		
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref	Pref	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Interior Low Plateau Seepage Fen			Marg			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Seepage Wetland						Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central Interior Acidic Cliff and Talus			Marg			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Central Interior Calcareous Cliff and Talus			Marg			
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Cumberland Acidic Cliff and Rockhouse				Marg	Marg	
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Spray Cliff				Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Montane Cliff and Talus				Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Interior Calcareous Cliff					Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Appalachian Rocky Summit						Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Southern Interior Sinkhole Wall			Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Ambystoma texanum (Smallmouth Salamander)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Aneides aeneus (Green Salamander)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Amphibian	Aneides aeneus (Green Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Amphibian	Aneides aeneus (Green Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Amphibian	Aneides aeneus (Green Salamander)	South-Central Interior Mesophytic Forest			Marg	Suit	Suit	
Amphibian	Aneides aeneus (Green Salamander)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Amphibian	Aneides aeneus (Green Salamander)	Southern Appalachian Oak Forest					Suit	
Amphibian	Aneides aeneus (Green Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	
Amphibian	Aneides aeneus (Green Salamander)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			
Amphibian	Aneides aeneus (Green Salamander)	Central Interior Highlands Calcareous Glade and Barrens			Pref	Marg	Suit	
Amphibian	Aneides aeneus (Green Salamander)	Nashville Basin Limestone Glade and Woodland			Pref			
Amphibian	Aneides aeneus (Green Salamander)	Cumberland Sandstone Glade and Barrens				Marg		
Amphibian	Aneides aeneus (Green Salamander)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Amphibian	Aneides aeneus (Green Salamander)	Central Interior Acidic Cliff and Talus			Suit			
Amphibian	Aneides aeneus (Green Salamander)	Central Interior Calcareous Cliff and Talus			Pref			
Amphibian	Aneides aeneus (Green Salamander)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Aneides aeneus (Green Salamander)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	
Amphibian	Aneides aeneus (Green Salamander)	Southern Interior Calcareous Cliff					Suit	
Amphibian	Aneides aeneus (Green Salamander)	Southern Interior Sinkhole Wall			Marg		Marg	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Southern and Central Appalachian Cove Forest				Marg	Marg	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Southern Appalachian Oak Forest					Marg	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Cumberland Seepage Forest				Suit		
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Marg	Marg	
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	South-Central Interior Small Stream and Riparian				Pref		
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Cumberland Acidic Cliff and Rockhouse				Pref		
Amphibian	Desmognathus abditus (Cumberland Dusky Salamander)	Southern Appalachian Spray Cliff				Pref		
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern and Central Appalachian Cove Forest						Suit
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern Appalachian Oak Forest						Marg
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern Appalachian Low-Elevation Pine Forest						Marg
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Amphibian	Desmognathus aeneus (Seepage Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Amphibian	Desmognathus aeneus (Seepage Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern and Central Appalachian Bog and Fen						Suit
Amphibian	Desmognathus aeneus (Seepage Salamander)	Southern Appalachian Seepage Wetland						Suit
Amphibian	Desmognathus aeneus (Seepage Salamander)	South-Central Interior Small Stream and Riparian						Suit
Amphibian	Desmognathus imitator (Imitator Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland						Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Oak Forest					Suit	Suit
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Amphibian	Desmognathus imitator (Imitator Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest					Pref	Pref
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Seepage Wetland						Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	South-Central Interior Small Stream and Riparian					Marg	Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Spray Cliff					Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Montane Cliff and Talus					Marg	Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Interior Calcareous Cliff					Marg	Marg
Amphibian	Desmognathus imitator (Imitator Salamander)	Southern Appalachian Rocky Summit						Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland						Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern and Central Appalachian Cove Forest					Suit	Suit
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Oak Forest					Suit	Suit
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest					Pref	Pref
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Seepage Wetland						Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	South-Central Interior Small Stream and Riparian					Marg	Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Spray Cliff					Marg	Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Montane Cliff and Talus					Marg	Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Interior Calcareous Cliff					Marg	Marg
Amphibian	Desmognathus organi (Northern Pygmy Salamander)	Southern Appalachian Rocky Summit						Marg
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Amphibian	Desmognathus welteri (Black Mountain Salamander)	South-Central Interior Mesophytic Forest				Suit	Suit	
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Southern Appalachian Oak Forest					Pref	Pref
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Southern Appalachian Northern Hardwood Forest						Pref
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Amphibian	Desmognathus welteri (Black Mountain Salamander)	Cumberland Seepage Forest				Marg		
Amphibian	Desmognathus welteri (Black Mountain Salamander)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref
Amphibian	Desmognathus welteri (Black Mountain Salamander)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Amphibian	Desmognathus wrighti (Pygmy Salamander)	South-Central Interior Mesophytic Forest					Suit	
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Southern and Central Appalachian Cove Forest					Suit	Suit
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Southern Appalachian Oak Forest					Suit	Marg
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Southern Appalachian Low-Elevation Pine Forest					Suit	Suit
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Southern Appalachian Montane Pine Forest and Woodland					Suit	Suit
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Amphibian	Desmognathus wrighti (Pygmy Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Appalachian Oak Forest					Suit	Suit
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Cumberland Seepage Forest				Suit		
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref	Pref	
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Interior Low Plateau Seepage Fen			Suit			
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Southern Appalachian Seepage Wetland						Pref
Amphibian	Hemidactylium scutatum (Four-toed Salamander)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Hyla gratiosa (Barking Treefrog)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Amphibian	Hyla gratiosa (Barking Treefrog)	Mississippi River Riparian Forest	Pref					
Amphibian	Hyla gratiosa (Barking Treefrog)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Amphibian	Hyla gratiosa (Barking Treefrog)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Amphibian	Hyla gratiosa (Barking Treefrog)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Amphibian	Hyla gratiosa (Barking Treefrog)	Cumberland Seepage Forest				Suit		
Amphibian	Hyla gratiosa (Barking Treefrog)	Mississippi River Bottomland Depression	Pref					
Amphibian	Hyla gratiosa (Barking Treefrog)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Amphibian	Hyla gratiosa (Barking Treefrog)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref		
Amphibian	Hyla gratiosa (Barking Treefrog)	Interior Low Plateau Seepage Fen			Suit			
Amphibian	Hyla gratiosa (Barking Treefrog)	South-Central Interior Small Stream and Riparian		Suit				
Amphibian	Hyla gratiosa (Barking Treefrog)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Amphibian	Hyla versicolor (Gray Treefrog)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Limestone Forest		Suit				
Amphibian	Hyla versicolor (Gray Treefrog)	South-Central Interior Mesophytic Forest		Suit				
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Amphibian	Hyla versicolor (Gray Treefrog)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Amphibian	Hyla versicolor (Gray Treefrog)	Mississippi River Riparian Forest	Marg					
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Amphibian	Hyla versicolor (Gray Treefrog)	East Gulf Coastal Plain Northern Seepage Swamp		Pref				
Amphibian	Hyla versicolor (Gray Treefrog)	Mississippi River Bottomland Depression	Suit					
Amphibian	Hyla versicolor (Gray Treefrog)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Amphibian	Hyla versicolor (Gray Treefrog)	South-Central Interior Small Stream and Riparian		Marg				
Amphibian	Hyla versicolor (Gray Treefrog)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Hyla versicolor (Gray Treefrog)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Hyla versicolor (Gray Treefrog)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Hyla versicolor (Gray Treefrog)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Hyla versicolor (Gray Treefrog)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Hyla versicolor (Gray Treefrog)	Edifice / Other Man-made Structure	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Lithobates areolatus (Crawfish Frog)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Amphibian	Lithobates areolatus (Crawfish Frog)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Amphibian	Lithobates areolatus (Crawfish Frog)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Amphibian	Lithobates areolatus (Crawfish Frog)	Mississippi River Riparian Forest	Marg					
Amphibian	Lithobates areolatus (Crawfish Frog)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Amphibian	Lithobates areolatus (Crawfish Frog)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Amphibian	Lithobates areolatus (Crawfish Frog)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Amphibian	Lithobates areolatus (Crawfish Frog)	Mississippi River Bottomland Depression	Marg					
Amphibian	Lithobates areolatus (Crawfish Frog)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Amphibian	Lithobates areolatus (Crawfish Frog)	South-Central Interior Small Stream and Riparian		Marg				
Amphibian	Lithobates areolatus (Crawfish Frog)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Lithobates areolatus (Crawfish Frog)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Lithobates areolatus (Crawfish Frog)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Lithobates areolatus (Crawfish Frog)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Lithobates areolatus (Crawfish Frog)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Lithobates areolatus (Crawfish Frog)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Lithobates areolatus (Crawfish Frog)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Suit	Suit	Suit	Suit	Suit	Suit
Amphibian	Plethodon aureolus (Tellico Salamander)	Southern and Central Appalachian Cove Forest						Suit
Amphibian	Plethodon aureolus (Tellico Salamander)	Southern Appalachian Oak Forest						Suit
Amphibian	Plethodon aureolus (Tellico Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Plethodon aureolus (Tellico Salamander)	Southern Appalachian Low-Elevation Pine Forest						Marg
Amphibian	Plethodon aureolus (Tellico Salamander)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Amphibian	Plethodon aureolus (Tellico Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest						Pref
Amphibian	Plethodon jordani (Red-cheeked Salamander)	Southern and Central Appalachian Cove Forest						Suit
Amphibian	Plethodon jordani (Red-cheeked Salamander)	Southern Appalachian Oak Forest						Marg
Amphibian	Plethodon jordani (Red-cheeked Salamander)	Southern Appalachian Northern Hardwood Forest						Pref
Amphibian	Plethodon jordani (Red-cheeked Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest						Pref
Amphibian	Plethodon jordani (Red-cheeked Salamander)	Southern Appalachian Montane Cliff and Talus						Suit
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland						Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern and Central Appalachian Cove Forest					Suit	Suit
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Oak Forest					Suit	Suit
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest					Pref	Pref
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Seepage Wetland						Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	South-Central Interior Small Stream and Riparian					Marg	Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Spray Cliff					Marg	Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Montane Cliff and Talus					Marg	Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Interior Calcareous Cliff					Marg	Marg
Amphibian	Plethodon montanus (Northern Gray-cheeked Salamander)	Southern Appalachian Rocky Summit						Marg
Amphibian	Plethodon richmondi (Ravine Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Amphibian	Plethodon richmondi (Ravine Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Amphibian	Plethodon richmondi (Ravine Salamander)	South-Central Interior Mesophytic Forest				Suit		
Amphibian	Plethodon richmondi (Ravine Salamander)	Southern and Central Appalachian Cove Forest				Suit		Suit
Amphibian	Plethodon richmondi (Ravine Salamander)	Southern Appalachian Oak Forest						Suit

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Amphibian	Plethodon richmondi (Ravine Salamander)	Southern Appalachian Northern Hardwood Forest						Marg
Amphibian	Plethodon richmondi (Ravine Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref		Pref
Amphibian	Plethodon richmondi (Ravine Salamander)	Southern Appalachian Montane Cliff and Talus				Suit		Suit
Amphibian	Plethodon shermani (Red-legged Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland						Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern and Central Appalachian Cove Forest					Suit	Suit
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Oak Forest					Suit	Suit
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Northern Hardwood Forest						Suit
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Amphibian	Plethodon shermani (Red-legged Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest					Pref	Pref
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Seepage Wetland						Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	South-Central Interior Small Stream and Riparian					Marg	Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Spray Cliff					Marg	Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Montane Cliff and Talus					Marg	Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Interior Calcareous Cliff					Marg	Marg
Amphibian	Plethodon shermani (Red-legged Salamander)	Southern Appalachian Rocky Summit						Marg
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	South-Central Interior Mesophytic Forest				Suit		
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	Southern and Central Appalachian Cove Forest				Suit		
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref		
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	Cumberland Acidic Cliff and Rockhouse				Marg		
Amphibian	Plethodon wehrlei (Wehrle's Salamander)	Southern Appalachian Montane Cliff and Talus				Suit		
Amphibian	Plethodon welleri (Weller's Salamander)	Southern and Central Appalachian Cove Forest						Suit
Amphibian	Plethodon welleri (Weller's Salamander)	Southern Appalachian Oak Forest						Marg
Amphibian	Plethodon welleri (Weller's Salamander)	Southern Appalachian Northern Hardwood Forest						Marg
Amphibian	Plethodon welleri (Weller's Salamander)	Southern Appalachian Low-Elevation Pine Forest						Marg
Amphibian	Plethodon welleri (Weller's Salamander)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Amphibian	Plethodon welleri (Weller's Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Amphibian	Plethodon welleri (Weller's Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Amphibian	Plethodon welleri (Weller's Salamander)	Southern Appalachian Montane Cliff and Talus						Suit
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Southern and Central Appalachian Cove Forest						Suit
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Southern Appalachian Oak Forest						Marg
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Southern Appalachian Low-Elevation Pine Forest						Marg
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Appalachian (Hemlock)-Northern Hardwood Forest						Pref
Amphibian	Plethodon yonahlossee (Yonahlossee Salamander)	Southern Appalachian Montane Cliff and Talus						Suit
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	South-Central Interior Mesophytic Forest				Suit		
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Southern and Central Appalachian Cove Forest				Suit		Suit
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Southern Appalachian Oak Forest						Marg
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Southern Appalachian Northern Hardwood Forest						Marg
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		Suit
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Cumberland Seepage Forest				Pref		
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Southern and Central Appalachian Bog and Fen						Pref
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Pref		
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Southern Appalachian Seepage Wetland						Pref
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	South-Central Interior Small Stream and Riparian				Marg		Marg
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	South-Central Interior Large Floodplain				Marg		
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Pseudacris brachyphona (Mountain Chorus Frog)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Amphibian	Pseudotriton montanus (Mud Salamander)	Cumberland Seepage Forest				Pref		
Amphibian	Pseudotriton montanus (Mud Salamander)	Southern and Central Appalachian Bog and Fen					Suit	Pref
Amphibian	Pseudotriton montanus (Mud Salamander)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Pref	Pref	
Amphibian	Pseudotriton montanus (Mud Salamander)	Southern Appalachian Seepage Wetland						Suit
Amphibian	Pseudotriton montanus (Mud Salamander)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit
Amphibian	Pseudotriton montanus (Mud Salamander)	South-Central Interior Large Floodplain				Marg	Marg	Marg
Amphibian	Rana capito (Carolina Gopher Frog)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Amphibian	Rana capito (Carolina Gopher Frog)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Amphibian	Rana capito (Carolina Gopher Frog)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Amphibian	Rana capito (Carolina Gopher Frog)	South-Central Interior / Upper Coastal Plain Flatwoods		Pref				
Amphibian	Rana capito (Carolina Gopher Frog)	South-Central Interior Mesophytic Forest		Suit	Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Amphibian	Rana capito (Carolina Gopher Frog)	Southern Appalachian Low-Elevation Pine Forest			Suit			
Amphibian	Rana capito (Carolina Gopher Frog)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Amphibian	Rana capito (Carolina Gopher Frog)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Amphibian	Rana capito (Carolina Gopher Frog)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Amphibian	Rana capito (Carolina Gopher Frog)	Mississippi River Riparian Forest	Suit					
Amphibian	Rana capito (Carolina Gopher Frog)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Amphibian	Rana capito (Carolina Gopher Frog)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Amphibian	Rana capito (Carolina Gopher Frog)	East Gulf Coastal Plain Northern Seepage Swamp		Pref				
Amphibian	Rana capito (Carolina Gopher Frog)	Mississippi River Bottomland Depression	Pref					
Amphibian	Rana capito (Carolina Gopher Frog)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Pref				
Amphibian	Rana capito (Carolina Gopher Frog)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Amphibian	Rana capito (Carolina Gopher Frog)	Interior Low Plateau Seepage Fen			Suit			
Arachnid	Microhexura montivaga (Spruce-fir Moss Spider)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Arachnid	Microhexura montivaga (Spruce-fir Moss Spider)	Appalachian (Hemlock)-Northern Hardwood Forest						Marg
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Limestone Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Appalachian Oak Forest					Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Appalachian Northern Hardwood Forest						Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					

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Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Mississippi River Riparian Forest	Suit					
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Cumberland Riverscour				Suit		
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Cumberland Seepage Forest				Suit		
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Mississippi River Bottomland Depression	Suit					
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Interior Low Plateau Seepage Fen			Suit			
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Appalachian Seepage Wetland						Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Southern Interior Sinkhole Wall						Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Corynorhinus rafinesquii (Rafinesque's Big-eared Bat)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Corynorhinus townsendii virginianus (Virginia Big-eared Bat)	Southern and Central Appalachian Cove Forest						Suit
Bat	Corynorhinus townsendii virginianus (Virginia Big-eared Bat)	Southern Appalachian Oak Forest						Suit
Bat	Corynorhinus townsendii virginianus (Virginia Big-eared Bat)	Southern Appalachian Northern Hardwood Forest						Suit
Bat	Corynorhinus townsendii virginianus (Virginia Big-eared Bat)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bat	Corynorhinus townsendii virginianus (Virginia Big-eared Bat)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bat	Myotis austroriparius (Southeastern Bat)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Limestone Forest		Marg				
Bat	Myotis austroriparius (Southeastern Bat)	South-Central Interior Mesophytic Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bat	Myotis austroriparius (Southeastern Bat)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bat	Myotis austroriparius (Southeastern Bat)	Mississippi River Riparian Forest	Pref					
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Bat	Myotis austroriparius (Southeastern Bat)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bat	Myotis austroriparius (Southeastern Bat)	Mississippi River Bottomland Depression	Pref					
Bat	Myotis austroriparius (Southeastern Bat)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bat	Myotis austroriparius (Southeastern Bat)	South-Central Interior Small Stream and Riparian		Suit				
Bat	Myotis austroriparius (Southeastern Bat)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis austroriparius (Southeastern Bat)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis austroriparius (Southeastern Bat)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis austroriparius (Southeastern Bat)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis austroriparius (Southeastern Bat)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bat	Myotis grisescens (Gray Bat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bat	Myotis grisescens (Gray Bat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bat	Myotis grisescens (Gray Bat)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Limestone Forest		Suit				
Bat	Myotis grisescens (Gray Bat)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	Southern Appalachian Oak Forest					Suit	
Bat	Myotis grisescens (Gray Bat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bat	Myotis grisescens (Gray Bat)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bat	Myotis grisescens (Gray Bat)	Cumberland Riverscour				Suit		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bat	Myotis grisescens (Gray Bat)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bat	Myotis grisescens (Gray Bat)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	
Bat	Myotis grisescens (Gray Bat)	South-Central Interior Large Floodplain			Pref	Pref	Pref	
Bat	Myotis grisescens (Gray Bat)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis grisescens (Gray Bat)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis grisescens (Gray Bat)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bat	Myotis leibii (Eastern Small-footed Bat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bat	Myotis leibii (Eastern Small-footed Bat)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Appalachian Oak Forest					Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Appalachian Northern Hardwood Forest						Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Cumberland Riverscour				Suit		
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Appalachian Seepage Wetland						Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	South-Central Interior Small Stream and Riparian			Suit	Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Central Interior Acidic Cliff and Talus			Suit			
Bat	Myotis leibii (Eastern Small-footed Bat)	Central Interior Calcareous Cliff and Talus			Suit			
Bat	Myotis leibii (Eastern Small-footed Bat)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Interior Calcareous Cliff					Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Southern Interior Sinkhole Wall			Suit		Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis leibii (Eastern Small-footed Bat)	Edifice / Other Man-made Structure	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis lucifugus (Little Brown Bat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Pref			
Bat	Myotis lucifugus (Little Brown Bat)	Southern Ridge and Valley / Cumberland Dry Calcareous				Pref	Pref	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Forest						
Bat	Myotis lucifugus (Little Brown Bat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Pref	Pref	Pref
Bat	Myotis lucifugus (Little Brown Bat)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bat	Myotis lucifugus (Little Brown Bat)	East Gulf Coastal Plain Limestone Forest		Pref				
Bat	Myotis lucifugus (Little Brown Bat)	South-Central Interior Mesophytic Forest		Pref	Pref	Pref	Pref	
Bat	Myotis lucifugus (Little Brown Bat)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Bat	Myotis lucifugus (Little Brown Bat)	Southern Appalachian Oak Forest					Pref	Pref
Bat	Myotis lucifugus (Little Brown Bat)	Southern Appalachian Northern Hardwood Forest						Pref
Bat	Myotis lucifugus (Little Brown Bat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bat	Myotis lucifugus (Little Brown Bat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bat	Myotis lucifugus (Little Brown Bat)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bat	Myotis lucifugus (Little Brown Bat)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Pref				
Bat	Myotis lucifugus (Little Brown Bat)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bat	Myotis lucifugus (Little Brown Bat)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Marg			
Bat	Myotis lucifugus (Little Brown Bat)	Appalachian Shale Barrens				Marg	Marg	Marg
Bat	Myotis lucifugus (Little Brown Bat)	Nashville Basin Limestone Glade and Woodland			Suit			
Bat	Myotis lucifugus (Little Brown Bat)	Cumberland Sandstone Glade and Barrens				Marg		
Bat	Myotis lucifugus (Little Brown Bat)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bat	Myotis lucifugus (Little Brown Bat)	Central Appalachian Alkaline Glade and Woodland					Suit	
Bat	Myotis lucifugus (Little Brown Bat)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Bat	Myotis lucifugus (Little Brown Bat)	Southern Ridge and Valley Patch Prairie					Suit	
Bat	Myotis lucifugus (Little Brown Bat)	Cumberland Riverscour				Suit		
Bat	Myotis lucifugus (Little Brown Bat)	Cumberland Seepage Forest				Pref		
Bat	Myotis lucifugus (Little Brown Bat)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bat	Myotis lucifugus (Little Brown Bat)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bat	Myotis lucifugus (Little Brown Bat)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bat	Myotis lucifugus (Little Brown Bat)	Interior Low Plateau Seepage Fen			Suit			
Bat	Myotis lucifugus (Little Brown Bat)	Southern Appalachian Seepage Wetland						Pref
Bat	Myotis lucifugus (Little Brown Bat)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref
Bat	Myotis lucifugus (Little Brown Bat)	South-Central Interior Large Floodplain			Pref	Pref	Pref	Pref
Bat	Myotis lucifugus (Little Brown Bat)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis lucifugus (Little Brown Bat)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis lucifugus (Little Brown Bat)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis lucifugus (Little Brown Bat)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis lucifugus (Little Brown Bat)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bat	Myotis lucifugus (Little Brown Bat)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bat	Myotis septentrionalis (Northern Myotis)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bat	Myotis septentrionalis (Northern Myotis)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bat	Myotis septentrionalis (Northern Myotis)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Bat	Myotis septentrionalis (Northern Myotis)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Southern Appalachian Oak Forest					Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Southern Appalachian Northern Hardwood Forest						Suit
Bat	Myotis septentrionalis (Northern Myotis)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bat	Myotis septentrionalis (Northern Myotis)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Bat	Myotis septentrionalis (Northern Myotis)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bat	Myotis septentrionalis (Northern Myotis)	South-Central Interior Small Stream and Riparian			Pref	Pref	Pref	Pref
Bat	Myotis septentrionalis (Northern Myotis)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bat	Myotis septentrionalis (Northern Myotis)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis septentrionalis (Northern Myotis)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bat	Myotis sodalis (Indiana Bat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bat	Myotis sodalis (Indiana Bat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bat	Myotis sodalis (Indiana Bat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bat	Myotis sodalis (Indiana Bat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bat	Myotis sodalis (Indiana Bat)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bat	Myotis sodalis (Indiana Bat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bat	Myotis sodalis (Indiana Bat)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Bat	Myotis sodalis (Indiana Bat)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	Southern Appalachian Oak Forest					Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	Southern Appalachian Northern Hardwood Forest						Suit
Bat	Myotis sodalis (Indiana Bat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	Central and Southern Appalachian Spruce-Fir Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bat	Myotis sodalis (Indiana Bat)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bat	Myotis sodalis (Indiana Bat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bat	Myotis sodalis (Indiana Bat)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Bat	Myotis sodalis (Indiana Bat)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bat	Myotis sodalis (Indiana Bat)	South-Central Interior Small Stream and Riparian			Pref	Pref	Pref	Pref
Bat	Myotis sodalis (Indiana Bat)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bat	Myotis sodalis (Indiana Bat)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Myotis sodalis (Indiana Bat)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Pref			
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref	Pref	
Bat	Perimyotis subflavus (Tri-colored Bat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Pref	Pref	Pref
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	South-Central Interior / Upper Coastal Plain Flatwoods		Pref				
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Limestone Forest		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Pref	
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Appalachian Oak Forest					Pref	Pref
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Appalachian Northern Hardwood Forest						Pref
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Bat	Perimyotis subflavus (Tri-colored Bat)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Bat	Perimyotis subflavus (Tri-colored Bat)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Bat	Perimyotis subflavus (Tri-colored Bat)	Mississippi River Riparian Forest	Suit					
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bat	Perimyotis subflavus (Tri-colored Bat)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bat	Perimyotis subflavus (Tri-colored Bat)	Cumberland Seepage Forest				Suit		
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Bat	Perimyotis subflavus (Tri-colored Bat)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bat	Perimyotis subflavus (Tri-colored Bat)	Interior Low Plateau Seepage Fen			Suit			
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Appalachian Seepage Wetland						Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	Central Interior Acidic Cliff and Talus			Suit			
Bat	Perimyotis subflavus (Tri-colored Bat)	Central Interior Calcareous Cliff and Talus			Suit			
Bat	Perimyotis subflavus (Tri-colored Bat)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	Southern Interior Calcareous Cliff					Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Perimyotis subflavus (Tri-colored Bat)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bat	Perimyotis subflavus (Tri-colored Bat)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bat	Perimyotis subflavus (Tri-colored Bat)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Accipiter striatus (Sharp-shinned Hawk)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Accipiter striatus (Sharp-shinned Hawk)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Suit			
Bird	Accipiter striatus (Sharp-shinned Hawk)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg	Marg	Marg	
Bird	Accipiter striatus (Sharp-shinned Hawk)	Nashville Basin Limestone Glade and Woodland			Marg			
Bird	Accipiter striatus (Sharp-shinned Hawk)	Cumberland Sandstone Glade and Barrens				Marg		
Bird	Accipiter striatus (Sharp-shinned Hawk)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Accipiter striatus (Sharp-shinned Hawk)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Accipiter striatus (Sharp-shinned Hawk)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Appalachian Grass and Shrub Bald						Marg
Bird	Accipiter striatus (Sharp-shinned Hawk)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Accipiter striatus (Sharp-shinned Hawk)	Mississippi River Riparian Forest	Pref					
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Accipiter striatus (Sharp-shinned Hawk)	Mississippi River Bottomland Depression	Suit					
Bird	Accipiter striatus (Sharp-shinned Hawk)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Accipiter striatus (Sharp-shinned Hawk)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Bird	Accipiter striatus (Sharp-shinned Hawk)	Interior Low Plateau Seepage Fen			Marg			
Bird	Accipiter striatus (Sharp-shinned Hawk)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Southern Appalachian Rocky Summit						Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Forest Plantation	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Accipiter striatus (Sharp-shinned Hawk)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Accipiter striatus (Sharp-shinned Hawk)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Accipiter striatus (Sharp-shinned Hawk)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Accipiter striatus (Sharp-shinned Hawk)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Accipiter striatus (Sharp-shinned Hawk)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Accipiter striatus (Sharp-shinned Hawk)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Southern and Central Appalachian Cove Forest						Suit
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Southern Appalachian Oak Forest						Suit
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Southern Appalachian Low-Elevation Pine Forest						Marg
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Bird	Aegolius acadicus (Northern Saw-whet Owl)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Ammodramus henslowii (Henslow's Sparrow)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			
Bird	Ammodramus henslowii (Henslow's Sparrow)	Appalachian Shale Barrens				Marg		
Bird	Ammodramus henslowii (Henslow's Sparrow)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit		
Bird	Ammodramus henslowii (Henslow's Sparrow)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Ammodramus henslowii (Henslow's Sparrow)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Ammodramus henslowii (Henslow's Sparrow)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Ammodramus henslowii (Henslow's Sparrow)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Ammodramus henslowii (Henslow's Sparrow)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Ammodramus henslowii (Henslow's Sparrow)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus henslowii (Henslow's Sparrow)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus henslowii (Henslow's Sparrow)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Ammodramus henslowii (Henslow's Sparrow)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus henslowii (Henslow's Sparrow)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Ammodramus leconteii (LeConte's Sparrow)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Marg				
Bird	Ammodramus leconteii (LeConte's Sparrow)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Bird	Ammodramus leconteii (LeConte's Sparrow)	Pennyroyal Karst Plain Prairie and Barrens			Marg			
Bird	Ammodramus leconteii (LeConte's Sparrow)	Western Highland Rim Prairie and Barrens			Marg			
Bird	Ammodramus leconteii (LeConte's Sparrow)	Eastern Highland Rim Prairie and Barrens			Marg			
Bird	Ammodramus leconteii (LeConte's Sparrow)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Bird	Ammodramus leconteii (LeConte's Sparrow)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Ammodramus leconteii (LeConte's Sparrow)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus leconteii (LeConte's Sparrow)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Cumberland Sandstone Glade and Barrens				Marg		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Ammodramus savannarum (Grasshopper Sparrow)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Ammodramus savannarum (Grasshopper Sparrow)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ammodramus savannarum (Grasshopper Sparrow)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Anas rubripes (American Black Duck)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Anas rubripes (American Black Duck)	Converted Wetland (Lacustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Converted Wetland (Riverine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Converted Wetland (Palustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Large River	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Medium River	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Small River	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Lake	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Anas rubripes (American Black Duck)	Channelized River / Stream	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Aquila chrysaetos (Golden Eagle)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Aquila chrysaetos (Golden Eagle)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg	Marg	Marg	
Bird	Aquila chrysaetos (Golden Eagle)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Aquila chrysaetos (Golden Eagle)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Aquila chrysaetos (Golden Eagle)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Aquila chrysaetos (Golden Eagle)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Bird	Aquila chrysaetos (Golden Eagle)	Southern Interior Calcareous Cliff					Suit	Suit
Bird	Ardea alba (Great Egret)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Ardea alba (Great Egret)	Mississippi River Riparian Forest	Suit					
Bird	Ardea alba (Great Egret)	Mississippi River Bottomland Depression	Pref					
Bird	Ardea alba (Great Egret)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ardea alba (Great Egret)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ardea alba (Great Egret)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Asio flammeus (Short-eared Owl)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			
Bird	Asio flammeus (Short-eared Owl)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Bird	Asio flammeus (Short-eared Owl)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Asio flammeus (Short-eared Owl)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Asio flammeus (Short-eared Owl)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Asio flammeus (Short-eared Owl)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Asio flammeus (Short-eared Owl)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Bird	Asio flammeus (Short-eared Owl)	Interior Low Plateau Seepage Fen			Marg			
Bird	Asio flammeus (Short-eared Owl)	South-Central Interior Small Stream and Riparian			Marg			
Bird	Asio flammeus (Short-eared Owl)	South-Central Interior Large Floodplain			Marg			
Bird	Asio flammeus (Short-eared Owl)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Asio flammeus (Short-eared Owl)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Asio flammeus (Short-eared Owl)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Asio flammeus (Short-eared Owl)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Asio flammeus (Short-eared Owl)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Bartramia longicauda (Upland Sandpiper)	Southern Appalachian Grass and Shrub Bald						Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Bartramia longicauda (Upland Sandpiper)	Mississippi River Riparian Forest	Suit					
Bird	Bartramia longicauda (Upland Sandpiper)	Mississippi River Bottomland Depression	Pref					
Bird	Bartramia longicauda (Upland Sandpiper)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Bartramia longicauda (Upland Sandpiper)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Bonasa umbellus (Ruffed Grouse)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Bonasa umbellus (Ruffed Grouse)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Bird	Bonasa umbellus (Ruffed Grouse)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Bonasa umbellus (Ruffed Grouse)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Bonasa umbellus (Ruffed Grouse)	Southern Appalachian Oak Forest					Pref	Pref
Bird	Bonasa umbellus (Ruffed Grouse)	Southern Appalachian Northern Hardwood Forest						Pref
Bird	Bonasa umbellus (Ruffed Grouse)	Southern Appalachian Low-Elevation Pine Forest			Suit	Marg	Marg	Marg
Bird	Bonasa umbellus (Ruffed Grouse)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bird	Bonasa umbellus (Ruffed Grouse)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Bonasa umbellus (Ruffed Grouse)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bird	Bonasa umbellus (Ruffed Grouse)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref	Pref	Pref
Bird	Bonasa umbellus (Ruffed Grouse)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Botaurus lentiginosus (American Bittern)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Botaurus lentiginosus (American Bittern)	Mississippi River Riparian Forest	Suit					
Bird	Botaurus lentiginosus (American Bittern)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Botaurus lentiginosus (American Bittern)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Botaurus lentiginosus (American Bittern)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Botaurus lentiginosus (American Bittern)	Mississippi River Bottomland Depression	Pref					
Bird	Botaurus lentiginosus (American Bittern)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Botaurus lentiginosus (American Bittern)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Bird	Botaurus lentiginosus (American Bittern)	Interior Low Plateau Seepage Fen			Suit			
Bird	Botaurus lentiginosus (American Bittern)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Bird	Botaurus lentiginosus (American Bittern)	South-Central Interior Large Floodplain			Pref			
Bird	Botaurus lentiginosus (American Bittern)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Botaurus lentiginosus (American Bittern)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Botaurus lentiginosus (American Bittern)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris canutus (Red Knot)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Calidris canutus (Red Knot)	Mississippi River Riparian Forest	Suit					
Bird	Calidris canutus (Red Knot)	Mississippi River Bottomland Depression	Pref					
Bird	Calidris canutus (Red Knot)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris canutus (Red Knot)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris canutus (Red Knot)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris canutus (Red Knot)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris canutus (Red Knot)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Calidris canutus (Red Knot)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris canutus (Red Knot)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris canutus (Red Knot)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris himantopus (Stilt Sandpiper)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Calidris himantopus (Stilt Sandpiper)	Mississippi River Riparian Forest	Pref					
Bird	Calidris himantopus (Stilt Sandpiper)	Mississippi River Bottomland Depression	Suit					
Bird	Calidris himantopus (Stilt Sandpiper)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris himantopus (Stilt Sandpiper)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris himantopus (Stilt Sandpiper)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris himantopus (Stilt Sandpiper)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris himantopus (Stilt Sandpiper)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris himantopus (Stilt Sandpiper)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris himantopus (Stilt Sandpiper)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris himantopus (Stilt Sandpiper)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris mauri (Western Sandpiper)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Calidris mauri (Western Sandpiper)	Mississippi River Riparian Forest	Suit					
Bird	Calidris mauri (Western Sandpiper)	Mississippi River Bottomland Depression	Pref					
Bird	Calidris mauri (Western Sandpiper)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris mauri (Western Sandpiper)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris mauri (Western Sandpiper)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris mauri (Western Sandpiper)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Calidris mauri (Western Sandpiper)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris mauri (Western Sandpiper)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris mauri (Western Sandpiper)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris pusilla (Semipalmated Sandpiper)	Mississippi River Bottomland Depression	Suit					
Bird	Calidris pusilla (Semipalmated Sandpiper)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Calidris pusilla (Semipalmated Sandpiper)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bird	Calidris pusilla (Semipalmated Sandpiper)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris pusilla (Semipalmated Sandpiper)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris pusilla (Semipalmated Sandpiper)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Calidris pusilla (Semipalmated Sandpiper)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	South-Central Interior Mesophytic Forest		Suit	Suit		Suit	
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern and Central Appalachian Cove Forest					Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Appalachian Low-Elevation Pine Forest			Suit		Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Appalachian Montane Pine Forest and Woodland					Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit		Suit	
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Caprimulgus carolinensis (Chuck-will's-widow)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Caprimulgus vociferus (Whip-poor-will)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Caprimulgus vociferus (Whip-poor-will)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Caprimulgus vociferus (Whip-poor-will)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bird	Caprimulgus vociferus (Whip-poor-will)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Caprimulgus vociferus (Whip-poor-will)	Appalachian Shale Barrens				Suit		Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Pref	Suit	
Bird	Caprimulgus vociferus (Whip-poor-will)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Caprimulgus vociferus (Whip-poor-will)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Caprimulgus vociferus (Whip-poor-will)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Caprimulgus vociferus (Whip-poor-will)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Caprimulgus vociferus (Whip-poor-will)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Caprimulgus vociferus (Whip-poor-will)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Caprimulgus vociferus (Whip-poor-will)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Caprimulgus vociferus (Whip-poor-will)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Caprimulgus vociferus (Whip-poor-will)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Caprimulgus vociferus (Whip-poor-will)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Caprimulgus vociferus (Whip-poor-will)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Caprimulgus vociferus (Whip-poor-will)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Cardellina canadensis (Canada Warbler)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Cardellina canadensis (Canada Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Cardellina canadensis (Canada Warbler)	Southern Appalachian Oak Forest						Marg
Bird	Cardellina canadensis (Canada Warbler)	Southern Appalachian Northern Hardwood Forest						Pref
Bird	Cardellina canadensis (Canada Warbler)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Bird	Cardellina canadensis (Canada Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Pref
Bird	Certhia americana (Brown Creeper)	Southern and Central Appalachian Cove Forest						Marg
Bird	Certhia americana (Brown Creeper)	Southern Appalachian Oak Forest						Suit
Bird	Certhia americana (Brown Creeper)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Certhia americana (Brown Creeper)	Southern Appalachian Low-Elevation Pine Forest						Marg
Bird	Certhia americana (Brown Creeper)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Bird	Certhia americana (Brown Creeper)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Bird	Certhia americana (Brown Creeper)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Chaetura pelagica (Chimney Swift)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Chaetura pelagica (Chimney Swift)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Chaetura pelagica (Chimney Swift)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	Marg
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Chaetura pelagica (Chimney Swift)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Chaetura pelagica (Chimney Swift)	South-Central Interior Mesophytic Forest		Marg	Marg	Marg	Marg	
Bird	Chaetura pelagica (Chimney Swift)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg
Bird	Chaetura pelagica (Chimney Swift)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Chaetura pelagica (Chimney Swift)	Southern Appalachian Northern Hardwood Forest						Marg
Bird	Chaetura pelagica (Chimney Swift)	Mississippi River High Floodplain (Bottomland) Forest	Pref					
Bird	Chaetura pelagica (Chimney Swift)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Chaetura pelagica (Chimney Swift)	Mississippi River Riparian Forest	Pref					
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Chaetura pelagica (Chimney Swift)	Cumberland Riverscour				Marg		
Bird	Chaetura pelagica (Chimney Swift)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Chaetura pelagica (Chimney Swift)	Cumberland Seepage Forest				Suit		
Bird	Chaetura pelagica (Chimney Swift)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Bird	Chaetura pelagica (Chimney Swift)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bird	Chaetura pelagica (Chimney Swift)	Edifice / Other Man-made Structure	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Chaetura pelagica (Chimney Swift)	Developed Open Space	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chaetura pelagica (Chimney Swift)	Low Intensity Developed	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chaetura pelagica (Chimney Swift)	Medium Intensity Developed	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chaetura pelagica (Chimney Swift)	High Intensity Developed	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius alexandrinus (Snowy Plover)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Charadrius alexandrinus (Snowy Plover)	Mississippi River Riparian Forest	Suit					
Bird	Charadrius alexandrinus (Snowy Plover)	Mississippi River Bottomland Depression	Pref					
Bird	Charadrius alexandrinus (Snowy Plover)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius alexandrinus (Snowy Plover)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius alexandrinus (Snowy Plover)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius melodus melodus (Piping Plover)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Charadrius melodus melodus (Piping Plover)	Mississippi River Riparian Forest	Suit					
Bird	Charadrius melodus melodus (Piping Plover)	Mississippi River Bottomland Depression	Pref					
Bird	Charadrius melodus melodus (Piping Plover)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius melodus melodus (Piping Plover)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius melodus melodus (Piping Plover)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius melodus melodus (Piping Plover)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius melodus melodus (Piping Plover)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius melodus melodus (Piping Plover)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius melodus melodus (Piping Plover)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius melodus melodus (Piping Plover)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius wilsonia (Wilson's Plover)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Charadrius wilsonia (Wilson's Plover)	Mississippi River Riparian Forest	Suit					
Bird	Charadrius wilsonia (Wilson's Plover)	Mississippi River Bottomland Depression	Pref					
Bird	Charadrius wilsonia (Wilson's Plover)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius wilsonia (Wilson's Plover)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius wilsonia (Wilson's Plover)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius wilsonia (Wilson's Plover)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Charadrius wilsonia (Wilson's Plover)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Charadrius wilsonia (Wilson's Plover)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Charadrius wilsonia (Wilson's Plover)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chordeiles minor (Common Nighthawk)	Central Interior Highlands Dry Acidic Glade and Barrens		Pref	Pref			
Bird	Chordeiles minor (Common Nighthawk)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Chordeiles minor (Common Nighthawk)	Nashville Basin Limestone Glade and Woodland			Pref			
Bird	Chordeiles minor (Common Nighthawk)	Cumberland Sandstone Glade and Barrens				Pref		
Bird	Chordeiles minor (Common Nighthawk)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Pref	
Bird	Chordeiles minor (Common Nighthawk)	Central Appalachian Alkaline Glade and Woodland					Pref	
Bird	Chordeiles minor (Common Nighthawk)	Southern and Central Appalachian Mafic Glade and Barrens						Pref
Bird	Chordeiles minor (Common Nighthawk)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Chordeiles minor (Common Nighthawk)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Chordeiles minor (Common Nighthawk)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Chordeiles minor (Common Nighthawk)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Chordeiles minor (Common Nighthawk)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Chordeiles minor (Common Nighthawk)	Cumberland Wet-Mesic Meadow and Savanna				Marg		
Bird	Chordeiles minor (Common Nighthawk)	Southern Ridge and Valley Patch Prairie					Marg	
Bird	Chordeiles minor (Common Nighthawk)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chordeiles minor (Common Nighthawk)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chordeiles minor (Common Nighthawk)	Low Intensity Developed	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chordeiles minor (Common Nighthawk)	Medium Intensity Developed	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Chordeiles minor (Common Nighthawk)	High Intensity Developed	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Circus cyaneus (Northern Harrier)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			
Bird	Circus cyaneus (Northern Harrier)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Bird	Circus cyaneus (Northern Harrier)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Circus cyaneus (Northern Harrier)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Circus cyaneus (Northern Harrier)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Circus cyaneus (Northern Harrier)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Circus cyaneus (Northern Harrier)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Bird	Circus cyaneus (Northern Harrier)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Circus cyaneus (Northern Harrier)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Circus cyaneus (Northern Harrier)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Circus cyaneus (Northern Harrier)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Circus cyaneus (Northern Harrier)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Cistothorus platensis (Sedge Wren)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Cistothorus platensis (Sedge Wren)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Bird	Cistothorus platensis (Sedge Wren)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Cistothorus platensis (Sedge Wren)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Cistothorus platensis (Sedge Wren)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Cistothorus platensis (Sedge Wren)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Cistothorus platensis (Sedge Wren)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Bird	Cistothorus platensis (Sedge Wren)	Interior Low Plateau Seepage Fen			Suit			
Bird	Cistothorus platensis (Sedge Wren)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Cistothorus platensis (Sedge Wren)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Cistothorus platensis (Sedge Wren)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Colinus virginianus (Northern Bobwhite)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Colinus virginianus (Northern Bobwhite)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Colinus virginianus (Northern Bobwhite)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Colinus virginianus (Northern Bobwhite)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Colinus virginianus (Northern Bobwhite)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	Marg
Bird	Colinus virginianus (Northern Bobwhite)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Colinus virginianus (Northern Bobwhite)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Colinus virginianus (Northern Bobwhite)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Colinus virginianus (Northern Bobwhite)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Bird	Colinus virginianus (Northern Bobwhite)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Bird	Colinus virginianus (Northern Bobwhite)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bird	Colinus virginianus (Northern Bobwhite)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Colinus virginianus (Northern Bobwhite)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Colinus virginianus (Northern Bobwhite)	Nashville Basin Limestone Glade and Woodland			Marg			
Bird	Colinus virginianus (Northern Bobwhite)	Cumberland Sandstone Glade and Barrens				Marg		
Bird	Colinus virginianus (Northern Bobwhite)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Colinus virginianus (Northern Bobwhite)	Central Appalachian Alkaline Glade and Woodland					Marg	
Bird	Colinus virginianus (Northern Bobwhite)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Bird	Colinus virginianus (Northern Bobwhite)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Colinus virginianus (Northern Bobwhite)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Colinus virginianus (Northern Bobwhite)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Colinus virginianus (Northern Bobwhite)	Western Highland Rim Prairie and Barrens			Pref			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Colinus virginianus (Northern Bobwhite)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Colinus virginianus (Northern Bobwhite)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Bird	Colinus virginianus (Northern Bobwhite)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Colinus virginianus (Northern Bobwhite)	Southern Appalachian Grass and Shrub Bald						Suit
Bird	Colinus virginianus (Northern Bobwhite)	Old Field / Successional	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Colinus virginianus (Northern Bobwhite)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Colinus virginianus (Northern Bobwhite)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Colinus virginianus (Northern Bobwhite)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern and Central Appalachian Cove Forest						Suit
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern Appalachian Oak Forest						Marg
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern Appalachian Low-Elevation Pine Forest						Marg
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Bird	Contopus cooperi (Olive-sided Flycatcher)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Bird	Contopus cooperi (Olive-sided Flycatcher)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern Appalachian Grass and Shrub Bald						Marg
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern and Central Appalachian Bog and Fen						Suit
Bird	Contopus cooperi (Olive-sided Flycatcher)	Southern Appalachian Seepage Wetland						Suit
Bird	Egretta caerulea (Little Blue Heron)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Egretta caerulea (Little Blue Heron)	Mississippi River Riparian Forest	Suit					
Bird	Egretta caerulea (Little Blue Heron)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Egretta caerulea (Little Blue Heron)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Egretta caerulea (Little Blue Heron)	East Gulf Coastal Plain Northern Seepage Swamp		Pref				
Bird	Egretta caerulea (Little Blue Heron)	Mississippi River Bottomland Depression	Pref					
Bird	Egretta caerulea (Little Blue Heron)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Egretta caerulea (Little Blue Heron)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Bird	Egretta caerulea (Little Blue Heron)	Interior Low Plateau Seepage Fen			Suit			
Bird	Egretta caerulea (Little Blue Heron)	South-Central Interior Small Stream and Riparian		Suit	Pref			
Bird	Egretta caerulea (Little Blue Heron)	South-Central Interior Large Floodplain			Suit			
Bird	Egretta caerulea (Little Blue Heron)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Egretta caerulea (Little Blue Heron)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Egretta caerulea (Little Blue Heron)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Empidonax alnorum (Alder Flycatcher)	Southern and Central Appalachian Cove Forest						Suit
Bird	Empidonax alnorum (Alder Flycatcher)	Southern Appalachian Oak Forest						Marg
Bird	Empidonax alnorum (Alder Flycatcher)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Empidonax alnorum (Alder Flycatcher)	Southern Appalachian Low-Elevation Pine Forest						Marg
Bird	Empidonax alnorum (Alder Flycatcher)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Bird	Empidonax alnorum (Alder Flycatcher)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Bird	Empidonax alnorum (Alder Flycatcher)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Empidonax alnorum (Alder Flycatcher)	Southern Appalachian Grass and Shrub Bald						Suit
Bird	Empidonax alnorum (Alder Flycatcher)	Southern and Central Appalachian Bog and Fen						Suit
Bird	Empidonax alnorum (Alder Flycatcher)	Southern Appalachian Seepage Wetland						Suit
Bird	Empidonax alnorum (Alder Flycatcher)	South-Central Interior Small Stream and Riparian						Suit
Bird	Empidonax minimus (Least Flycatcher)	Southern and Central Appalachian Cove Forest						Suit
Bird	Empidonax minimus (Least Flycatcher)	Southern Appalachian Oak Forest						Suit
Bird	Empidonax minimus (Least Flycatcher)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Empidonax minimus (Least Flycatcher)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Empidonax minimus (Least Flycatcher)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Empidonax minimus (Least Flycatcher)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Empidonax minimus (Least Flycatcher)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Empidonax minimus (Least Flycatcher)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Empidonax traillii (Willow Flycatcher)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Empidonax traillii (Willow Flycatcher)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	Marg
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	South-Central Interior Mesophytic Forest		Marg	Marg	Marg	Marg	
Bird	Empidonax traillii (Willow Flycatcher)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg
Bird	Empidonax traillii (Willow Flycatcher)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Empidonax traillii (Willow Flycatcher)	Southern Appalachian Northern Hardwood Forest						Marg
Bird	Empidonax traillii (Willow Flycatcher)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Empidonax traillii (Willow Flycatcher)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Empidonax traillii (Willow Flycatcher)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Empidonax traillii (Willow Flycatcher)	Ridge and Valley Calcareous Valley Bottom Glade and					Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Woodland						
Bird	Empidonax traillii (Willow Flycatcher)	Central Appalachian Alkaline Glade and Woodland					Suit	
Bird	Empidonax traillii (Willow Flycatcher)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Empidonax traillii (Willow Flycatcher)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Empidonax traillii (Willow Flycatcher)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Empidonax traillii (Willow Flycatcher)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Empidonax traillii (Willow Flycatcher)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Bird	Empidonax traillii (Willow Flycatcher)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Empidonax traillii (Willow Flycatcher)	Mississippi River High Floodplain (Bottomland) Forest	Marg					
Bird	Empidonax traillii (Willow Flycatcher)	Mississippi River Riparian Forest	Marg					
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Bird	Empidonax traillii (Willow Flycatcher)	South-Central Interior Small Stream and Riparian		Marg	Marg	Marg	Marg	Marg
Bird	Empidonax traillii (Willow Flycatcher)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Bird	Empidonax traillii (Willow Flycatcher)	Forest Plantation	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Empidonax traillii (Willow Flycatcher)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Euphagus carolinus (Rusty Blackbird)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Euphagus carolinus (Rusty Blackbird)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Euphagus carolinus (Rusty Blackbird)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Euphagus carolinus (Rusty Blackbird)	South-Central Interior / Upper Coastal Plain Flatwoods		Pref				
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Euphagus carolinus (Rusty Blackbird)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Euphagus carolinus (Rusty Blackbird)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Mississippi River High Floodplain (Bottomland) Forest	Pref					

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Euphagus carolinus (Rusty Blackbird)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Euphagus carolinus (Rusty Blackbird)	Mississippi River Riparian Forest	Pref					
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Bird	Euphagus carolinus (Rusty Blackbird)	Cumberland Riverscour				Pref		
Bird	Euphagus carolinus (Rusty Blackbird)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Euphagus carolinus (Rusty Blackbird)	Cumberland Seepage Forest				Suit		
Bird	Euphagus carolinus (Rusty Blackbird)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Mississippi River Bottomland Depression	Pref					
Bird	Euphagus carolinus (Rusty Blackbird)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Euphagus carolinus (Rusty Blackbird)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bird	Euphagus carolinus (Rusty Blackbird)	Interior Low Plateau Seepage Fen			Suit			
Bird	Euphagus carolinus (Rusty Blackbird)	Southern Appalachian Seepage Wetland						Suit
Bird	Euphagus carolinus (Rusty Blackbird)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	South-Central Interior Large Floodplain			Pref	Pref	Pref	Pref
Bird	Euphagus carolinus (Rusty Blackbird)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Euphagus carolinus (Rusty Blackbird)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Euphagus carolinus (Rusty Blackbird)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Euphagus carolinus (Rusty Blackbird)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Falco peregrinus (Peregrine Falcon)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Falco peregrinus (Peregrine Falcon)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Falco peregrinus (Peregrine Falcon)	South-Central Interior Mesophytic Forest			Marg	Marg	Marg	
Bird	Falco peregrinus (Peregrine Falcon)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Southern Appalachian Northern Hardwood Forest						Marg
Bird	Falco peregrinus (Peregrine Falcon)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Bird	Falco peregrinus (Peregrine Falcon)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Falco peregrinus (Peregrine Falcon)	Central Interior Highlands Dry Acidic Glade and Barrens			Marg			
Bird	Falco peregrinus (Peregrine Falcon)	Appalachian Shale Barrens				Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Central Interior Highlands Calcareous Glade and Barrens			Marg	Marg	Marg	
Bird	Falco peregrinus (Peregrine Falcon)	Nashville Basin Limestone Glade and Woodland			Marg			
Bird	Falco peregrinus (Peregrine Falcon)	Cumberland Sandstone Glade and Barrens				Marg		
Bird	Falco peregrinus (Peregrine Falcon)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Falco peregrinus (Peregrine Falcon)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Bird	Falco peregrinus (Peregrine Falcon)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Falco peregrinus (Peregrine Falcon)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Falco peregrinus (Peregrine Falcon)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Falco peregrinus (Peregrine Falcon)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Falco peregrinus (Peregrine Falcon)	Southern Appalachian Grass and Shrub Bald						Marg
Bird	Falco peregrinus (Peregrine Falcon)	South-Central Interior Small Stream and Riparian			Suit	Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Central Interior Acidic Cliff and Talus			Suit			
Bird	Falco peregrinus (Peregrine Falcon)	Central Interior Calcareous Cliff and Talus			Suit			
Bird	Falco peregrinus (Peregrine Falcon)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Bird	Falco peregrinus (Peregrine Falcon)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Southern Interior Calcareous Cliff					Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Southern Interior Sinkhole Wall			Suit			
Bird	Falco peregrinus (Peregrine Falcon)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Falco peregrinus (Peregrine Falcon)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Falco peregrinus (Peregrine Falcon)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Gallinula galeata (Common Gallinule)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Gallinula galeata (Common Gallinule)	Cumberland Seepage Forest				Marg		
Bird	Gallinula galeata (Common Gallinule)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Bird	Gallinula galeata (Common Gallinule)	Mississippi River Bottomland Depression	Suit					
Bird	Gallinula galeata (Common Gallinule)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Gallinula galeata (Common Gallinule)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Bird	Gallinula galeata (Common Gallinule)	Interior Low Plateau Seepage Fen			Suit			
Bird	Gallinula galeata (Common Gallinule)	Southern Appalachian Seepage Wetland						Suit
Bird	Gallinula galeata (Common Gallinule)	Converted Wetland (Lacustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Gallinula galeata (Common Gallinule)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Gallinula galeata (Common Gallinule)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Geothlypis Formosa (Kentucky Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Pref				
Bird	Geothlypis Formosa (Kentucky Warbler)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	South-Central Interior Mesophytic Forest		Suit	Pref	Suit	Suit	
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Appalachian Oak Forest					Marg	Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Bird	Geothlypis Formosa (Kentucky Warbler)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Geothlypis Formosa (Kentucky Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref	Pref	Pref
Bird	Geothlypis Formosa (Kentucky Warbler)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Geothlypis Formosa (Kentucky Warbler)	Mississippi River Riparian Forest	Suit					
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	Cumberland Seepage Forest				Suit		
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	Mississippi River Bottomland Depression	Suit					

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Geothlypis Formosa (Kentucky Warbler)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Geothlypis Formosa (Kentucky Warbler)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bird	Geothlypis Formosa (Kentucky Warbler)	Interior Low Plateau Seepage Fen			Suit			
Bird	Geothlypis Formosa (Kentucky Warbler)	Southern Appalachian Seepage Wetland						Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bird	Geothlypis Formosa (Kentucky Warbler)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Geothlypis Formosa (Kentucky Warbler)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Geothlypis Formosa (Kentucky Warbler)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Geothlypis Formosa (Kentucky Warbler)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Geothlypis Formosa (Kentucky Warbler)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Grus americana (Whooping Crane)	South-Central Interior Small Stream and Riparian					Marg	
Bird	Grus americana (Whooping Crane)	South-Central Interior Large Floodplain					Suit	
Bird	Grus americana (Whooping Crane)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Grus americana (Whooping Crane)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Grus americana (Whooping Crane)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Grus americana (Whooping Crane)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Grus americana (Whooping Crane)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Grus americana (Whooping Crane)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Haliaeetus leucocephalus (Bald Eagle)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Haliaeetus leucocephalus (Bald Eagle)	South-Central Interior Mesophytic Forest		Suit	Marg	Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern and Central Appalachian Cove Forest				Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Appalachian Oak Forest					Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Haliaeetus leucocephalus (Bald Eagle)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Haliaeetus leucocephalus (Bald Eagle)	Mississippi River Riparian Forest	Pref					
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Bird	Haliaeetus leucocephalus (Bald Eagle)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Haliaeetus leucocephalus (Bald Eagle)	Mississippi River Bottomland Depression	Suit					
Bird	Haliaeetus leucocephalus (Bald Eagle)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Haliaeetus leucocephalus (Bald Eagle)	South-Central Interior Small Stream and Riparian		Marg	Marg	Marg	Marg	
Bird	Haliaeetus leucocephalus (Bald Eagle)	South-Central Interior Large Floodplain			Pref	Pref	Pref	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Central Interior Acidic Cliff and Talus			Suit			
Bird	Haliaeetus leucocephalus (Bald Eagle)	Central Interior Calcareous Cliff and Talus			Suit			
Bird	Haliaeetus leucocephalus (Bald Eagle)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Southern Interior Calcareous Cliff					Suit	
Bird	Haliaeetus leucocephalus (Bald Eagle)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Haliaeetus leucocephalus (Bald Eagle)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Haliaeetus leucocephalus (Bald Eagle)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Pref			
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref	Pref	Pref
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Mississippi River Riparian Forest	Pref					
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Helmitheros vermivorum (Worm-eating Warbler)	South-Central Interior Small Stream and Riparian		Suit	Marg	Marg	Marg	Marg
Bird	Helmitheros vermivorum (Worm-eating Warbler)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Bird	Helmitheros vermivorum (Worm-eating Warbler)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Hylocichla mustelina (Wood Thrush)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Hylocichla mustelina (Wood Thrush)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Hylocichla mustelina (Wood Thrush)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Pref				
Bird	Hylocichla mustelina (Wood Thrush)	South-Central Interior / Upper Coastal Plain Flatwoods		Pref				
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Hylocichla mustelina (Wood Thrush)	South-Central Interior Mesophytic Forest		Suit	Pref	Pref	Pref	
Bird	Hylocichla mustelina (Wood Thrush)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Bird	Hylocichla mustelina (Wood Thrush)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Hylocichla mustelina (Wood Thrush)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Hylocichla mustelina (Wood Thrush)	Southern Appalachian Low-Elevation Pine Forest			Marg			
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Hylocichla mustelina (Wood Thrush)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Hylocichla mustelina (Wood Thrush)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Hylocichla mustelina (Wood Thrush)	Mississippi River Riparian Forest	Suit					
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Hylocichla mustelina (Wood Thrush)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Hylocichla mustelina (Wood Thrush)	Mississippi River Bottomland Depression	Marg					
Bird	Hylocichla mustelina (Wood Thrush)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Hylocichla mustelina (Wood Thrush)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Hylocichla mustelina (Wood Thrush)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Bird	Hylocichla mustelina (Wood Thrush)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Hylocichla mustelina (Wood Thrush)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Icteria virens (Yellow-breasted Chat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Icteria virens (Yellow-breasted Chat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Icteria virens (Yellow-breasted Chat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	Marg
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Bird	Icteria virens (Yellow-breasted Chat)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Icteria virens (Yellow-breasted Chat)	South-Central Interior Mesophytic Forest		Marg	Marg	Marg	Marg	
Bird	Icteria virens (Yellow-breasted Chat)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Icteria virens (Yellow-breasted Chat)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Icteria virens (Yellow-breasted Chat)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Icteria virens (Yellow-breasted Chat)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Bird	Icteria virens (Yellow-breasted Chat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Bird	Icteria virens (Yellow-breasted Chat)	Central Interior Highlands Calcareous Glade and Barrens		Pref	Pref	Pref	Pref	
Bird	Icteria virens (Yellow-breasted Chat)	Nashville Basin Limestone Glade and Woodland			Pref			
Bird	Icteria virens (Yellow-breasted Chat)	Cumberland Sandstone Glade and Barrens				Pref		
Bird	Icteria virens (Yellow-breasted Chat)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Pref	
Bird	Icteria virens (Yellow-breasted Chat)	Central Appalachian Alkaline Glade and Woodland					Pref	
Bird	Icteria virens (Yellow-breasted Chat)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Icteria virens (Yellow-breasted Chat)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Icteria virens (Yellow-breasted Chat)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Icteria virens (Yellow-breasted Chat)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Icteria virens (Yellow-breasted Chat)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Bird	Icteria virens (Yellow-breasted Chat)	Southern Ridge and Valley Patch Prairie					Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Icteria virens (Yellow-breasted Chat)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Bird	Icteria virens (Yellow-breasted Chat)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Icteria virens (Yellow-breasted Chat)	Mississippi River Riparian Forest	Marg					
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Icteria virens (Yellow-breasted Chat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Icteria virens (Yellow-breasted Chat)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Icteria virens (Yellow-breasted Chat)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Icterus spurius (Orchard Oriole)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Icterus spurius (Orchard Oriole)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Bird	Icterus spurius (Orchard Oriole)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Bird	Icterus spurius (Orchard Oriole)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Icterus spurius (Orchard Oriole)	South-Central Interior Mesophytic Forest		Marg	Marg		Marg	
Bird	Icterus spurius (Orchard Oriole)	Southern and Central Appalachian Cove Forest					Marg	
Bird	Icterus spurius (Orchard Oriole)	Southern Appalachian Oak Forest					Marg	
Bird	Icterus spurius (Orchard Oriole)	Southern Appalachian Low-Elevation Pine Forest			Marg			
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Icterus spurius (Orchard Oriole)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Icterus spurius (Orchard Oriole)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Marg		Marg	
Bird	Icterus spurius (Orchard Oriole)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Icterus spurius (Orchard Oriole)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Icterus spurius (Orchard Oriole)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Icterus spurius (Orchard Oriole)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Icterus spurius (Orchard Oriole)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Icterus spurius (Orchard Oriole)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Icterus spurius (Orchard Oriole)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Icterus spurius (Orchard Oriole)	Mississippi River Riparian Forest	Suit					
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Icterus spurius (Orchard Oriole)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Icterus spurius (Orchard Oriole)	Mississippi River Bottomland Depression	Marg					
Bird	Icterus spurius (Orchard Oriole)	South-Central Interior Small Stream and Riparian		Marg	Marg		Suit	
Bird	Icterus spurius (Orchard Oriole)	South-Central Interior Large Floodplain			Suit		Marg	
Bird	Icterus spurius (Orchard Oriole)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Icterus spurius (Orchard Oriole)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Icterus spurius (Orchard Oriole)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Icterus spurius (Orchard Oriole)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Icterus spurius (Orchard Oriole)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Ictinia mississippiensis (Mississippi Kite)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Ictinia mississippiensis (Mississippi Kite)	Mississippi River Riparian Forest	Pref					
Bird	Ictinia mississippiensis (Mississippi Kite)	Mississippi River Bottomland Depression	Marg					
Bird	Ictinia mississippiensis (Mississippi Kite)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Ictinia mississippiensis (Mississippi Kite)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ictinia mississippiensis (Mississippi Kite)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ictinia mississippiensis (Mississippi Kite)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ictinia mississippiensis (Mississippi Kite)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ictinia mississippiensis (Mississippi Kite)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ictinia mississippiensis (Mississippi Kite)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ixobrychus exilis (Least Bittern)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Bird	Ixobrychus exilis (Least Bittern)	Mississippi River Riparian Forest	Marg					
Bird	Ixobrychus exilis (Least Bittern)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Bird	Ixobrychus exilis (Least Bittern)	Mississippi River Bottomland Depression	Pref					
Bird	Ixobrychus exilis (Least Bittern)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Ixobrychus exilis (Least Bittern)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit		Suit	
Bird	Ixobrychus exilis (Least Bittern)	South-Central Interior Small Stream and Riparian			Suit		Suit	
Bird	Ixobrychus exilis (Least Bittern)	South-Central Interior Large Floodplain			Marg		Marg	
Bird	Ixobrychus exilis (Least Bittern)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ixobrychus exilis (Least Bittern)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Ixobrychus exilis (Least Bittern)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Lanius ludovicianus (Loggerhead Shrike)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Lanius ludovicianus (Loggerhead Shrike)	Appalachian Shale Barrens				Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Lanius ludovicianus (Loggerhead Shrike)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Marg	Suit	
Bird	Lanius ludovicianus (Loggerhead Shrike)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Lanius ludovicianus (Loggerhead Shrike)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bird	Lanius ludovicianus (Loggerhead Shrike)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Bird	Lanius ludovicianus (Loggerhead Shrike)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Lanius ludovicianus (Loggerhead Shrike)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Lanius ludovicianus (Loggerhead Shrike)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Lanius ludovicianus (Loggerhead Shrike)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Lanius ludovicianus (Loggerhead Shrike)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Lanius ludovicianus (Loggerhead Shrike)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Lanius ludovicianus (Loggerhead Shrike)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Lanius ludovicianus (Loggerhead Shrike)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Lanius ludovicianus (Loggerhead Shrike)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Lanius ludovicianus (Loggerhead Shrike)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Lanius ludovicianus (Loggerhead Shrike)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Mississippi River Riparian Forest	Pref					
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Cumberland Riverscour				Marg		
Bird	Limnothlypis swainsonii (Swainson's Warbler)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Cumberland Seepage Forest				Marg		
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Mississippi River Bottomland Depression	Pref					
Bird	Limnothlypis swainsonii (Swainson's Warbler)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Marg	Marg	
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Interior Low Plateau Seepage Fen			Marg			
Bird	Limnothlypis swainsonii (Swainson's Warbler)	Southern Appalachian Seepage Wetland						Marg
Bird	Limnothlypis swainsonii (Swainson's Warbler)	South-Central Interior Small Stream and Riparian		Suit	Pref	Pref	Pref	Pref
Bird	Limnothlypis swainsonii (Swainson's Warbler)	South-Central Interior Large Floodplain			Suit	Suit	Marg	Marg
Bird	Limosa fedoa (Marbled Godwit)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Limosa fedoa (Marbled Godwit)	Mississippi River Riparian Forest	Suit					
Bird	Limosa fedoa (Marbled Godwit)	Mississippi River Bottomland Depression	Pref					
Bird	Limosa fedoa (Marbled Godwit)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Limosa fedoa (Marbled Godwit)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Limosa fedoa (Marbled Godwit)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Limosa haemastica (Hudsonian Godwit)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Limosa haemastica (Hudsonian Godwit)	Mississippi River Riparian Forest	Suit					
Bird	Limosa haemastica (Hudsonian Godwit)	Mississippi River Bottomland Depression	Pref					
Bird	Limosa haemastica (Hudsonian Godwit)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Limosa haemastica (Hudsonian Godwit)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Limosa haemastica (Hudsonian Godwit)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Limosa haemastica (Hudsonian Godwit)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Limosa haemastica (Hudsonian Godwit)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Limosa haemastica (Hudsonian Godwit)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Limosa haemastica (Hudsonian Godwit)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Appalachian Low-Elevation Pine Forest			Marg	Suit	Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Mississippi River Riparian Forest	Suit					
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Mississippi River Bottomland Depression	Suit					
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Marg	Marg	
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Interior Low Plateau Seepage Fen			Marg			
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Southern Appalachian Seepage Wetland						Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	South-Central Interior Large Floodplain			Pref	Suit	Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Melanerpes erythrocephalus (Red-headed Woodpecker)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Numenius phaeopus (Whimbrel)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Numenius phaeopus (Whimbrel)	Mississippi River Riparian Forest	Suit					
Bird	Numenius phaeopus (Whimbrel)	Mississippi River Bottomland Depression	Pref					
Bird	Numenius phaeopus (Whimbrel)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Numenius phaeopus (Whimbrel)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Numenius phaeopus (Whimbrel)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Mississippi River High Floodplain (Bottomland) Forest	Pref					
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Mississippi River Riparian Forest	Pref					
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Cumberland Riverscour				Suit		
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Cumberland Seepage Forest				Suit		
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Mississippi River Bottomland Depression	Pref					
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Interior Low Plateau Seepage Fen			Marg			
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Southern Appalachian Seepage Wetland						Marg
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Converted Wetland (Lacustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Converted Wetland (Riverine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Converted Wetland (Palustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Nycticorax nycticorax (Black-crowned Night-heron)	Channelized River / Stream	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Parkesia motacilla (Louisiana Waterthrush)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Parkesia motacilla (Louisiana Waterthrush)	Mississippi River Riparian Forest	Pref					
Bird	Parkesia motacilla (Louisiana Waterthrush)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Parkesia motacilla (Louisiana Waterthrush)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Bird	Parkesia motacilla (Louisiana Waterthrush)	Cumberland Riverscour				Marg		
Bird	Parkesia motacilla (Louisiana Waterthrush)	Mississippi River Bottomland Depression	Pref					
Bird	Parkesia motacilla (Louisiana Waterthrush)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Parkesia motacilla (Louisiana Waterthrush)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bird	Passerina ciris (Painted Bunting)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Passerina ciris (Painted Bunting)	Mississippi River Riparian Forest	Suit					
Bird	Passerina ciris (Painted Bunting)	Mississippi River Bottomland Depression	Suit					
Bird	Passerina ciris (Painted Bunting)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Passerina ciris (Painted Bunting)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Passerina ciris (Painted Bunting)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Passerina ciris (Painted Bunting)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Passerina ciris (Painted Bunting)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Passerina ciris (Painted Bunting)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Passerina ciris (Painted Bunting)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Passerina ciris (Painted Bunting)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Peucaea aestivalis (Bachman's Sparrow)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Peucaea aestivalis (Bachman's Sparrow)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Peucaea aestivalis (Bachman's Sparrow)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Peucaea aestivalis (Bachman's Sparrow)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bird	Peucaea aestivalis (Bachman's Sparrow)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Bird	Peucaea aestivalis (Bachman's Sparrow)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Peucaea aestivalis (Bachman's Sparrow)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Peucaea aestivalis (Bachman's Sparrow)	South-Central Interior Mesophytic Forest		Marg	Marg	Marg	Marg	
Bird	Peucaea aestivalis (Bachman's Sparrow)	Southern Appalachian Oak Forest					Marg	
Bird	Peucaea aestivalis (Bachman's Sparrow)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	
Bird	Peucaea aestivalis (Bachman's Sparrow)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	
Bird	Peucaea aestivalis (Bachman's Sparrow)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bird	Peucaea aestivalis (Bachman's Sparrow)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Peucaea aestivalis (Bachman's Sparrow)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Peucaea aestivalis (Bachman's Sparrow)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Peucaea aestivalis (Bachman's Sparrow)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Peucaea aestivalis (Bachman's Sparrow)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bird	Peucaea aestivalis (Bachman's Sparrow)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Peucaea aestivalis (Bachman's Sparrow)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Peucaea aestivalis (Bachman's Sparrow)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Peucaea aestivalis (Bachman's Sparrow)	Western Highland Rim Prairie and Barrens			Pref			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Peucaea aestivalis (Bachman's Sparrow)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Peucaea aestivalis (Bachman's Sparrow)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Peucaea aestivalis (Bachman's Sparrow)	Forest Plantation	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Peucaea aestivalis (Bachman's Sparrow)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Peucaea aestivalis (Bachman's Sparrow)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Peucaea aestivalis (Bachman's Sparrow)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Peucaea aestivalis (Bachman's Sparrow)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Pluvialis dominica (American Golden Plover)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Pluvialis dominica (American Golden Plover)	Mississippi River Riparian Forest	Suit					
Bird	Pluvialis dominica (American Golden Plover)	Mississippi River Bottomland Depression	Suit					
Bird	Pluvialis dominica (American Golden Plover)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Pluvialis dominica (American Golden Plover)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Pluvialis dominica (American Golden Plover)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Pluvialis dominica (American Golden Plover)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Poecile atricapillus (Black-capped Chickadee)	Southern and Central Appalachian Cove Forest						Suit
Bird	Poecile atricapillus (Black-capped Chickadee)	Southern Appalachian Oak Forest						Suit
Bird	Poecile atricapillus (Black-capped Chickadee)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Poecile atricapillus (Black-capped Chickadee)	Southern Appalachian Low-Elevation Pine Forest						Suit
Bird	Poecile atricapillus (Black-capped Chickadee)	Southern Appalachian Montane Pine Forest and Woodland						Pref
Bird	Poecile atricapillus (Black-capped Chickadee)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Bird	Poecile atricapillus (Black-capped Chickadee)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Porphyrula martinica (Purple Gallinule)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Porphyrula martinica (Purple Gallinule)	Cumberland Seepage Forest				Marg		
Bird	Porphyrula martinica (Purple Gallinule)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Bird	Porphyrula martinica (Purple Gallinule)	Mississippi River Bottomland Depression	Suit					
Bird	Porphyrula martinica (Purple Gallinule)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Bird	Porphyrula martinica (Purple Gallinule)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Bird	Porphyrula martinica (Purple Gallinule)	Interior Low Plateau Seepage Fen			Suit			
Bird	Porphyrula martinica (Purple Gallinule)	Southern Appalachian Seepage Wetland						Suit
Bird	Porphyrula martinica (Purple Gallinule)	Converted Wetland (Lacustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Porphyrula martinica (Purple Gallinule)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Porphyrula martinica (Purple Gallinule)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Protonotaria citrea (Prothonotary Warbler)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Protonotaria citrea (Prothonotary Warbler)	Mississippi River Riparian Forest	Pref					
Bird	Protonotaria citrea (Prothonotary Warbler)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Protonotaria citrea (Prothonotary Warbler)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Protonotaria citrea (Prothonotary Warbler)	Cumberland Riverscour				Marg		
Bird	Protonotaria citrea (Prothonotary Warbler)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Protonotaria citrea (Prothonotary Warbler)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Protonotaria citrea (Prothonotary Warbler)	Mississippi River Bottomland Depression	Pref					
Bird	Protonotaria citrea (Prothonotary Warbler)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Protonotaria citrea (Prothonotary Warbler)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Marg	Marg	
Bird	Protonotaria citrea (Prothonotary Warbler)	Interior Low Plateau Seepage Fen			Suit			
Bird	Protonotaria citrea (Prothonotary Warbler)	Southern Appalachian Seepage Wetland						Marg
Bird	Protonotaria citrea (Prothonotary Warbler)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Protonotaria citrea (Prothonotary Warbler)	South-Central Interior Large Floodplain			Pref	Pref	Pref	Pref
Bird	Protonotaria citrea (Prothonotary Warbler)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Protonotaria citrea (Prothonotary Warbler)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Protonotaria citrea (Prothonotary Warbler)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Rallus elegans (King Rail)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Rallus elegans (King Rail)	Mississippi River Bottomland Depression	Pref					
Bird	Rallus elegans (King Rail)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Bird	Rallus elegans (King Rail)	South-Central Interior Small Stream and Riparian		Suit	Pref			
Bird	Rallus elegans (King Rail)	South-Central Interior Large Floodplain			Pref			
Bird	Rallus elegans (King Rail)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Rallus elegans (King Rail)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Rallus elegans (King Rail)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Rallus limicola (Virginia Rail)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Rallus limicola (Virginia Rail)	Cumberland Seepage Forest				Marg		
Bird	Rallus limicola (Virginia Rail)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Bird	Rallus limicola (Virginia Rail)	Mississippi River Bottomland Depression	Suit					
Bird	Rallus limicola (Virginia Rail)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Bird	Rallus limicola (Virginia Rail)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Bird	Rallus limicola (Virginia Rail)	Interior Low Plateau Seepage Fen			Suit			
Bird	Rallus limicola (Virginia Rail)	Southern Appalachian Seepage Wetland						Suit
Bird	Rallus limicola (Virginia Rail)	Converted Wetland (Lacustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Bird	Rallus limicola (Virginia Rail)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Rallus limicola (Virginia Rail)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Riparia riparia (Bank Swallow)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Riparia riparia (Bank Swallow)	Mississippi River Riparian Forest	Suit					
Bird	Riparia riparia (Bank Swallow)	Mississippi River Bottomland Depression	Suit					
Bird	Riparia riparia (Bank Swallow)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Riparia riparia (Bank Swallow)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Riparia riparia (Bank Swallow)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Riparia riparia (Bank Swallow)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Riparia riparia (Bank Swallow)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Riparia riparia (Bank Swallow)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Riparia riparia (Bank Swallow)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Riparia riparia (Bank Swallow)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bird	Scolopax minor (American Woodcock)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Bird	Scolopax minor (American Woodcock)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Scolopax minor (American Woodcock)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Bird	Scolopax minor (American Woodcock)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Scolopax minor (American Woodcock)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Scolopax minor (American Woodcock)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Scolopax minor (American Woodcock)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Scolopax minor (American Woodcock)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Bird	Scolopax minor (American Woodcock)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Bird	Scolopax minor (American Woodcock)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Scolopax minor (American Woodcock)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Scolopax minor (American Woodcock)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Scolopax minor (American Woodcock)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Scolopax minor (American Woodcock)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Scolopax minor (American Woodcock)	Mississippi River Riparian Forest	Suit					
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Scolopax minor (American Woodcock)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Scolopax minor (American Woodcock)	Cumberland Seepage Forest				Marg		
Bird	Scolopax minor (American Woodcock)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Scolopax minor (American Woodcock)	Mississippi River Bottomland Depression	Marg					
Bird	Scolopax minor (American Woodcock)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Bird	Scolopax minor (American Woodcock)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Bird	Scolopax minor (American Woodcock)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Scolopax minor (American Woodcock)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Bird	Scolopax minor (American Woodcock)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Scolopax minor (American Woodcock)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Scolopax minor (American Woodcock)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Scolopax minor (American Woodcock)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Scolopax minor (American Woodcock)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Scolopax minor (American Woodcock)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	South-Central Interior Mesophytic Forest				Suit		
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Southern and Central Appalachian Cove Forest				Suit		Suit
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Southern Appalachian Oak Forest						Suit
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Setophaga caerulescens (Black-throated Blue Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref		Pref
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Setophaga cerulea (Cerulean Warbler)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Setophaga cerulea (Cerulean Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Setophaga cerulea (Cerulean Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Setophaga cerulea (Cerulean Warbler)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Limestone Forest		Suit				
Bird	Setophaga cerulea (Cerulean Warbler)	South-Central Interior Mesophytic Forest		Suit	Pref	Pref	Pref	
Bird	Setophaga cerulea (Cerulean Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Setophaga cerulea (Cerulean Warbler)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Setophaga cerulea (Cerulean Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Setophaga cerulea (Cerulean Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Setophaga cerulea (Cerulean Warbler)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Bird	Setophaga cerulea (Cerulean Warbler)	Mississippi River Riparian Forest	Pref					
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Setophaga cerulea (Cerulean Warbler)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Bird	Setophaga cerulea (Cerulean Warbler)	Mississippi River Bottomland Depression	Suit					
Bird	Setophaga cerulea (Cerulean Warbler)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Setophaga cerulea (Cerulean Warbler)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Bird	Setophaga cerulea (Cerulean Warbler)	South-Central Interior Small Stream and Riparian		Suit	Suit	Marg	Marg	
Bird	Setophaga cerulea (Cerulean Warbler)	South-Central Interior Large Floodplain			Suit			
Bird	Setophaga discolor (Prairie Warbler)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Setophaga discolor (Prairie Warbler)	Appalachian Shale Barrens				Marg	Marg	
Bird	Setophaga discolor (Prairie Warbler)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Setophaga discolor (Prairie Warbler)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Setophaga discolor (Prairie Warbler)	Cumberland Sandstone Glade and Barrens				Pref		
Bird	Setophaga discolor (Prairie Warbler)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Bird	Setophaga discolor (Prairie Warbler)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Setophaga discolor (Prairie Warbler)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Setophaga discolor (Prairie Warbler)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Setophaga discolor (Prairie Warbler)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Setophaga discolor (Prairie Warbler)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Setophaga discolor (Prairie Warbler)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Setophaga discolor (Prairie Warbler)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Setophaga discolor (Prairie Warbler)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Setophaga dominica (Yellow-throated Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Forest						
Bird	Setophaga dominica (Yellow-throated Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bird	Setophaga dominica (Yellow-throated Warbler)	South-Central Interior Mesophytic Forest				Suit	Suit	
Bird	Setophaga dominica (Yellow-throated Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Setophaga dominica (Yellow-throated Warbler)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Setophaga dominica (Yellow-throated Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Setophaga dominica (Yellow-throated Warbler)	Southern Appalachian Low-Elevation Pine Forest				Suit	Suit	Suit
Bird	Setophaga dominica (Yellow-throated Warbler)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Suit	Suit
Bird	Setophaga dominica (Yellow-throated Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Setophaga dominica (Yellow-throated Warbler)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Setophaga fusca (Blackburnian Warbler)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Bird	Setophaga fusca (Blackburnian Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Pref
Bird	Setophaga fusca (Blackburnian Warbler)	Southern Appalachian Oak Forest						Suit
Bird	Setophaga fusca (Blackburnian Warbler)	Southern Appalachian Northern Hardwood Forest						Pref
Bird	Setophaga fusca (Blackburnian Warbler)	Southern Appalachian Montane Pine Forest and Woodland						Pref
Bird	Setophaga fusca (Blackburnian Warbler)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Setophaga fusca (Blackburnian Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Pref
Bird	Sitta pusilla (Brown-headed Nuthatch)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Bird	Sitta pusilla (Brown-headed Nuthatch)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Bird	Sitta pusilla (Brown-headed Nuthatch)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Bird	Sitta pusilla (Brown-headed Nuthatch)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Bird	Sitta pusilla (Brown-headed Nuthatch)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bird	Sitta pusilla (Brown-headed Nuthatch)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Bird	Sitta pusilla (Brown-headed Nuthatch)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Sitta pusilla (Brown-headed Nuthatch)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Sitta pusilla (Brown-headed Nuthatch)	South-Central Interior Mesophytic Forest		Marg			Marg	
Bird	Sitta pusilla (Brown-headed Nuthatch)	Southern and Central Appalachian Cove Forest					Marg	Marg
Bird	Sitta pusilla (Brown-headed Nuthatch)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Sitta pusilla (Brown-headed Nuthatch)	Southern Appalachian Northern Hardwood Forest						Marg
Bird	Sitta pusilla (Brown-headed Nuthatch)	Southern Appalachian Low-Elevation Pine Forest					Pref	Pref
Bird	Sitta pusilla (Brown-headed Nuthatch)	Southern Appalachian Montane Pine Forest and Woodland					Pref	Pref
Bird	Sitta pusilla (Brown-headed Nuthatch)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Pref				
Bird	Sitta pusilla (Brown-headed Nuthatch)	Appalachian (Hemlock)-Northern Hardwood Forest					Marg	Marg
Bird	Sitta pusilla (Brown-headed Nuthatch)	Forest Plantation	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Sitta pusilla (Brown-headed Nuthatch)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Sphyrapicus varius (Yellow-bellied Sapsucker)	Southern and Central Appalachian Cove Forest						Suit
Bird	Sphyrapicus varius (Yellow-bellied Sapsucker)	Southern Appalachian Oak Forest						Suit
Bird	Sphyrapicus varius (Yellow-bellied Sapsucker)	Southern Appalachian Northern Hardwood Forest						Pref
Bird	Sphyrapicus varius (Yellow-bellied Sapsucker)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Sternula antillarum athalassos (Interior Least Tern)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Sternula antillarum athalassos (Interior Least Tern)	Mississippi River Riparian Forest	Suit					
Bird	Sternula antillarum athalassos (Interior Least Tern)	Mississippi River Bottomland Depression	Pref					
Bird	Sternula antillarum athalassos (Interior Least Tern)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Sternula antillarum athalassos (Interior Least Tern)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Sternula antillarum athalassos (Interior Least Tern)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Sturnella magna (Eastern Meadowlark)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Bird	Sturnella magna (Eastern Meadowlark)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Marg				
Bird	Sturnella magna (Eastern Meadowlark)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Bird	Sturnella magna (Eastern Meadowlark)	Pennyroyal Karst Plain Prairie and Barrens			Marg			
Bird	Sturnella magna (Eastern Meadowlark)	Western Highland Rim Prairie and Barrens			Marg			
Bird	Sturnella magna (Eastern Meadowlark)	Eastern Highland Rim Prairie and Barrens			Marg			
Bird	Sturnella magna (Eastern Meadowlark)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Sturnella magna (Eastern Meadowlark)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Sturnella magna (Eastern Meadowlark)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Thryomanes bewickii (Bewick's Wren)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Thryomanes bewickii (Bewick's Wren)	Appalachian Shale Barrens				Marg	Marg	Marg
Bird	Thryomanes bewickii (Bewick's Wren)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Thryomanes bewickii (Bewick's Wren)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Thryomanes bewickii (Bewick's Wren)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Thryomanes bewickii (Bewick's Wren)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bird	Thryomanes bewickii (Bewick's Wren)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Bird	Thryomanes bewickii (Bewick's Wren)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Thryomanes bewickii (Bewick's Wren)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Thryomanes bewickii (Bewick's Wren)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Thryomanes bewickii (Bewick's Wren)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Thryomanes bewickii (Bewick's Wren)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Thryomanes bewickii (Bewick's Wren)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Thryomanes bewickii (Bewick's Wren)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Thryomanes bewickii (Bewick's Wren)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Thryomanes bewickii (Bewick's Wren)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Thryomanes bewickii (Bewick's Wren)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Thryomanes bewickii (Bewick's Wren)	Edifice / Other Man-made Structure	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Troglodytes troglodytes (Winter Wren)	Southern and Central Appalachian Cove Forest						Suit
Bird	Troglodytes troglodytes (Winter Wren)	Southern Appalachian Oak Forest						Marg
Bird	Troglodytes troglodytes (Winter Wren)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Troglodytes troglodytes (Winter Wren)	Southern Appalachian Low-Elevation Pine Forest						Marg
Bird	Troglodytes troglodytes (Winter Wren)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Bird	Troglodytes troglodytes (Winter Wren)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Bird	Troglodytes troglodytes (Winter Wren)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Mississippi River Riparian Forest	Suit					
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Mississippi River Bottomland Depression	Pref					
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tryngites subruficollis (Buff-breasted Sandpiper)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Tympanuchus cupido (Greater Prairie-chicken)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Tyto alba (Barn Owl)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Bird	Tyto alba (Barn Owl)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Tyto alba (Barn Owl)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Marg	Suit	Suit	
Bird	Tyto alba (Barn Owl)	Nashville Basin Limestone Glade and Woodland			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Tyto alba (Barn Owl)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Tyto alba (Barn Owl)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Bird	Tyto alba (Barn Owl)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Bird	Tyto alba (Barn Owl)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Tyto alba (Barn Owl)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Tyto alba (Barn Owl)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Bird	Tyto alba (Barn Owl)	Western Highland Rim Prairie and Barrens			Suit			
Bird	Tyto alba (Barn Owl)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Tyto alba (Barn Owl)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Tyto alba (Barn Owl)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Tyto alba (Barn Owl)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Bird	Tyto alba (Barn Owl)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bird	Tyto alba (Barn Owl)	Interior Low Plateau Seepage Fen			Suit			
Bird	Tyto alba (Barn Owl)	Southern Appalachian Seepage Wetland						Suit
Bird	Tyto alba (Barn Owl)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tyto alba (Barn Owl)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tyto alba (Barn Owl)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tyto alba (Barn Owl)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Tyto alba (Barn Owl)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Tyto alba (Barn Owl)	Edifice / Other Man-made Structure	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Bird	Vermivora chrysoptera (Golden-winged Warbler)	South-Central Interior Mesophytic Forest				Suit	Suit	
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern Appalachian Oak Forest					Suit	Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern Appalachian Northern Hardwood Forest						Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Appalachian Shale Barrens				Marg	Marg	Marg
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Central Interior Highlands Calcareous Glade and Barrens				Suit	Pref	
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Cumberland Sandstone Glade and Barrens				Pref		
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Pref	
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern and Central Appalachian Mafic Glade and Barrens						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern Ridge and Valley Patch Prairie					Suit	
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern Appalachian Grass and Shrub Bald						Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Southern Appalachian Rocky Summit						Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora chrysoptera (Golden-winged Warbler)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Limestone Forest		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	South-Central Interior Mesophytic Forest		Marg	Marg	Marg	Marg	
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Appalachian Oak Forest					Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Appalachian Northern Hardwood Forest						Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Appalachian Shale Barrens				Suit	Suit	Suit
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Cumberland Sandstone Glade and Barrens				Suit		
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Western Highland Rim Prairie and Barrens			Pref			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Eastern Highland Rim Prairie and Barrens			Pref			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Ridge and Valley Patch Prairie					Pref	
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Mississippi River Riparian Forest	Suit					
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Cumberland Riverscour				Marg		
Bird	Vermivora cyanoptera (Blue-winged Warbler)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Cumberland Seepage Forest				Marg		
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Mississippi River Bottomland Depression	Suit					
Bird	Vermivora cyanoptera (Blue-winged Warbler)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Interior Low Plateau Seepage Fen			Suit			
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Southern Appalachian Seepage Wetland						Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Bird	Vermivora cyanoptera (Blue-winged Warbler)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vermivora cyanoptera (Blue-winged Warbler)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Vireo bellii (Bell's Vireo)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit				
Bird	Vireo bellii (Bell's Vireo)	Central Interior Highlands Calcareous Glade and Barrens		Suit				
Bird	Vireo bellii (Bell's Vireo)	Nashville Basin Limestone Glade and Woodland			Suit			
Bird	Vireo bellii (Bell's Vireo)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Bird	Vireo bellii (Bell's Vireo)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Bird	Vireo bellii (Bell's Vireo)	Eastern Highland Rim Prairie and Barrens			Suit			
Bird	Vireo bellii (Bell's Vireo)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Bird	Vireo bellii (Bell's Vireo)	Mississippi River Riparian Forest	Suit					
Bird	Vireo bellii (Bell's Vireo)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Bird	Vireo bellii (Bell's Vireo)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Bird	Vireo bellii (Bell's Vireo)	Mississippi River Bottomland Depression	Suit					
Bird	Vireo bellii (Bell's Vireo)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Bird	Vireo bellii (Bell's Vireo)	South-Central Interior Small Stream and Riparian		Pref				
Bird	Vireo bellii (Bell's Vireo)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Bird	Vireo bellii (Bell's Vireo)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Bird	Vireo bellii (Bell's Vireo)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Gastropod	Anguispira alabama (Alabama Tigersnail)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Anguispira alabama (Alabama Tigersnail)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Anguispira alabama (Alabama Tigersnail)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Anguispira alabama (Alabama Tigersnail)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Anguispira alabama (Alabama Tigersnail)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Anguispira alabama (Alabama Tigersnail)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Anguispira alabama (Alabama Tigersnail)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Anguispira cumberlandiana (Cumberland Tigersnail)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern Appalachian Oak Forest					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern Appalachian Low-Elevation Pine Forest					Marg	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern Appalachian Montane Pine Forest and Woodland					Marg	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern Ridge and Valley Patch Prairie					Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Southern Interior Calcareous Cliff					Suit	
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Anguispira knoxensis (Rustic Tigersnail)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Anguispira kochi (Banded Tigershell)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Gastropod	Anguispira kochi (Banded Tigershell)	Mississippi River Riparian Forest	Suit					
Gastropod	Anguispira picta (Painted Tigersnail)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Anguispira picta (Painted Tigersnail)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Anguispira picta (Painted Tigersnail)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Anguispira picta (Painted Tigersnail)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Anguispira picta (Painted Tigersnail)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Anguispira picta (Painted Tigersnail)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Anguispira picta (Painted Tigersnail)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Daedalochila auriformis (Rockpile Liptooth)	Western Highland Rim Prairie and Barrens			Suit			
Gastropod	Daedalochila auriformis (Rockpile Liptooth)	Eastern Highland Rim Prairie and Barrens			Pref			
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Discus bryanti (Sawtooth Disc)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Discus bryanti (Sawtooth Disc)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Discus bryanti (Sawtooth Disc)	Southern and Central Appalachian Cove Forest					Suit	Suit
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Appalachian Low-Elevation Pine Forest					Marg	Marg
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Gastropod	Discus bryanti (Sawtooth Disc)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Interior Calcareous Cliff					Suit	Suit
Gastropod	Discus bryanti (Sawtooth Disc)	Southern Interior Sinkhole Wall					Suit	Suit
Gastropod	Discus clappi (Channelled Disc)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Discus clappi (Channelled Disc)	South-Central Interior Mesophytic Forest			Suit			
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern and Central Appalachian Cove Forest					Suit	Suit
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern Appalachian Low-Elevation Pine Forest					Marg	Marg
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Gastropod	Euchemotrema fraternum montanum ((a pillsnail))	Southern Interior Sinkhole Wall					Suit	Suit
Gastropod	Fumonelix archeri (Ocoee Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Fumonelix archeri (Ocoee Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Fumonelix archeri (Ocoee Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Fumonelix archeri (Ocoee Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Fumonelix archeri (Ocoee Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Fumonelix archeri (Ocoee Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Fumonelix christyi (Glossy Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Fumonelix christyi (Glossy Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Fumonelix christyi (Glossy Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Fumonelix christyi (Glossy Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Fumonelix christyi (Glossy Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Fumonelix christyi (Glossy Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Gastropod	Fumonelix jonesiana (Big-tooth Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Marg
Gastropod	Fumonelix orestes (Engraved Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Fumonelix orestes (Engraved Covert)	Southern Appalachian Oak Forest						Marg
Gastropod	Fumonelix orestes (Engraved Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Fumonelix orestes (Engraved Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Fumonelix orestes (Engraved Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Fumonelix orestes (Engraved Covert)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Fumonelix orestes (Engraved Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Fumonelix wetherbyi (Clifty Covert)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Fumonelix wetherbyi (Clifty Covert)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Fumonelix wetherbyi (Clifty Covert)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Fumonelix wetherbyi (Clifty Covert)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Fumonelix wetherbyi (Clifty Covert)	Southern Appalachian Low-Elevation Pine Forest				Marg		

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Gastropod	Fumonelix wetherbyi (Clifty Covert)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Fumonelix wetherbyi (Clifty Covert)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Fumonelix wheatleyi (Cinnamon Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Fumonelix wheatleyi clingmanicus (Clingman Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Glyphyalinia junaluskana (Dark Glyph)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Glyphyalinia junaluskana (Dark Glyph)	Southern Appalachian Oak Forest						Suit
Gastropod	Glyphyalinia junaluskana (Dark Glyph)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Glyphyalinia ocoae (Blue-gray Glyph)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Glyphyalinia ocoae (Blue-gray Glyph)	Southern Appalachian Oak Forest						Suit
Gastropod	Glyphyalinia ocoae (Blue-gray Glyph)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Glyphyalinia ocoae (Blue-gray Glyph)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Glyphyalinia ocoae (Blue-gray Glyph)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Glyphyalinia ocoae (Blue-gray Glyph)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Southern and Central Appalachian Cove Forest				Suit		Suit
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Southern Appalachian Oak Forest						Suit
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Southern Appalachian Low-Elevation Pine Forest				Marg		Marg
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Southern Appalachian Montane Pine Forest and Woodland				Marg		Marg
Gastropod	Glyphyalinia pentadelphia (Pink Glyph)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		Suit
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			

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Gastropod	Glyphyalinia rimula (Tongued Glyph)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	South-Central Interior Mesophytic Forest			Suit	Suit		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Glyphyalinia rimula (Tongued Glyph)	Southern Interior Sinkhole Wall			Suit			
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Southern Appalachian Oak Forest						Suit
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Haplotrema kendeighi (Blue-footed Lancetooth)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	South-Central Interior Mesophytic Forest			Suit	Suit		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Central Interior Acidic Cliff and Talus			Suit			
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Cumberland Acidic Cliff and Rockhouse				Suit		
Gastropod	Helicodiscus aldrichianus (Burrowing Coil)	Southern Appalachian Montane Cliff and Talus				Suit		
Gastropod	Helicodiscus enneodon (Bluff Coil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	Southern Appalachian Oak Forest					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	Southern Appalachian Low-Elevation Pine Forest					Marg	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Helicodiscus enneodon (Bluff Coil)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	Southern Interior Calcareous Cliff					Suit	
Gastropod	Helicodiscus enneodon (Bluff Coil)	Southern Interior Sinkhole Wall					Suit	
Gastropod	Helicodiscus fimbriatus (Fringed Coil)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Helicodiscus fimbriatus (Fringed Coil)	Southern Appalachian Oak Forest						Suit
Gastropod	Helicodiscus fimbriatus (Fringed Coil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Helicodiscus fimbriatus (Fringed Coil)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Helicodiscus fimbriatus (Fringed Coil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Helicodiscus hexodon (Toothy Coil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Helicodiscus hexodon (Toothy Coil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Helicodiscus hexodon (Toothy Coil)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Helicodiscus hexodon (Toothy Coil)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Helicodiscus hexodon (Toothy Coil)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Helicodiscus hexodon (Toothy Coil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Inflectarius downieanus (Dwarf Globelet)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Southern and Central Appalachian Cove Forest				Suit		Suit
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Southern Appalachian Oak Forest						Suit
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Southern Appalachian Low-Elevation Pine Forest				Suit		Suit
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Southern Appalachian Montane Pine Forest and Woodland				Suit		Suit
Gastropod	Inflectarius downieanus (Dwarf Globelet)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		Suit
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Inflectarius ferrissi (Smoky Mountain Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Inflectarius kalmianus (Brown Globelet)	Central Interior Highlands Dry Acidic Glade and Barrens			Suit			
Gastropod	Inflectarius kalmianus (Brown Globelet)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit		
Gastropod	Inflectarius kalmianus (Brown Globelet)	Nashville Basin Limestone Glade and Woodland			Marg			
Gastropod	Inflectarius kalmianus (Brown Globelet)	Cumberland Sandstone Glade and Barrens				Marg		
Gastropod	Inflectarius kalmianus (Brown Globelet)	Pennyroyal Karst Plain Prairie and Barrens			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Inflectarius kalmianus (Brown Globelet)	Western Highland Rim Prairie and Barrens			Suit			
Gastropod	Inflectarius kalmianus (Brown Globelet)	Eastern Highland Rim Prairie and Barrens			Suit			
Gastropod	Inflectarius kalmianus (Brown Globelet)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Inflectarius kalmianus (Brown Globelet)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Gastropod	Inflectarius kalmianus (Brown Globelet)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Gastropod	Inflectarius smithi (Alabama Shagreen)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Inflectarius smithi (Alabama Shagreen)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Inflectarius smithi (Alabama Shagreen)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Inflectarius smithi (Alabama Shagreen)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Inflectarius smithi (Alabama Shagreen)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Inflectarius smithi (Alabama Shagreen)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Inflectarius smithi (Alabama Shagreen)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Southern Appalachian Oak Forest						Suit
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Inflectarius subpalliatus (Velvet Covert)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Megapallifera wetherbyi (Blotchy Mantleslug)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Mesodon altivagus (Wandering Globe)	Southern and Central Appalachian Cove Forest						Marg
Gastropod	Mesodon altivagus (Wandering Globe)	Southern Appalachian Oak Forest						Marg
Gastropod	Mesodon altivagus (Wandering Globe)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Mesodon altivagus (Wandering Globe)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Mesodon altivagus (Wandering Globe)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Mesodon altivagus (Wandering Globe)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Mesodon altivagus (Wandering Globe)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Mesodon andrewsae (Balsam Globe)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Mesodon andrewsae (Balsam Globe)	Southern Appalachian Oak Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Mesodon andrewsae (Balsam Globe)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Mesodon andrewsae (Balsam Globe)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Mesodon andrewsae (Balsam Globe)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Mesodon andrewsae (Balsam Globe)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Mesodon andrewsae (Balsam Globe)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Mesodon sanus (Squat Globelet)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Mesodon sanus (Squat Globelet)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Mesodon sanus (Squat Globelet)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Mesodon sanus (Squat Globelet)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Mesodon sanus (Squat Globelet)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Mesodon sanus (Squat Globelet)	Cumberland Seepage Forest				Marg		
Gastropod	Mesodon sanus (Squat Globelet)	Southern Appalachian Montane Cliff and Talus				Suit		
Gastropod	Mesomphix andrewsae (Mountain Button)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Mesomphix andrewsae (Mountain Button)	Southern Appalachian Oak Forest						Marg
Gastropod	Mesomphix andrewsae (Mountain Button)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Mesomphix andrewsae (Mountain Button)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Mesomphix andrewsae (Mountain Button)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Mesomphix andrewsae (Mountain Button)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Gastropod	Mesomphix rugeli (Wrinkled Button)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Gastropod	Mesomphix rugeli (Wrinkled Button)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Gastropod	Mesomphix rugeli (Wrinkled Button)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Mesomphix rugeli (Wrinkled Button)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Gastropod	Mesomphix rugeli (Wrinkled Button)	Southern Interior Sinkhole Wall					Suit	Suit
Gastropod	Mesomphix subplanus (Flat Button)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Mesomphix subplanus (Flat Button)	Southern Appalachian Oak Forest						Suit
Gastropod	Mesomphix subplanus (Flat Button)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Mesomphix subplanus (Flat Button)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Mesomphix subplanus (Flat Button)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Mesomphix subplanus (Flat Button)	Central and Southern Appalachian Spruce-Fir Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Mesomphix subplanus (Flat Button)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea alethia (Goddess Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Gastropod	Paravitrea alethia (Goddess Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Gastropod	Paravitrea alethia (Goddess Supercoil)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Paravitrea alethia (Goddess Supercoil)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Paravitrea alethia (Goddess Supercoil)	Southern Appalachian Oak Forest					Marg	
Gastropod	Paravitrea alethia (Goddess Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Paravitrea andrewsae (High Mountain Supercoil)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Paravitrea andrewsae (High Mountain Supercoil)	Southern Appalachian Oak Forest						Marg
Gastropod	Paravitrea andrewsae (High Mountain Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea andrewsae (High Mountain Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea bellona (Club Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Paravitrea bellona (Club Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Paravitrea bellona (Club Supercoil)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Paravitrea bellona (Club Supercoil)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Paravitrea bellona (Club Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Paravitrea bellona (Club Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Paravitrea bellona (Club Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Paravitrea blarina (Shrew Supercoil)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern Appalachian Oak Forest					Suit	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern Appalachian Low-Elevation Pine Forest			Marg		Marg	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern Appalachian Montane Pine Forest and Woodland					Marg	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Paravitrea blarina (Shrew Supercoil)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Paravitrea blarina (Shrew Supercoil)	Southern Interior Calcareous Cliff					Suit	
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Paravitrea calcicola (Pearl Supercoil)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Paravitrea calcicola (Pearl Supercoil)	Southern Appalachian Montane Cliff and Talus				Suit		
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Southern Appalachian Oak Forest						Marg
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Paravitrea clappi (Mirey Ridge Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea lamellidens (Lamellate Supercoil)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Paravitrea lamellidens (Lamellate Supercoil)	Southern Appalachian Oak Forest						Suit
Gastropod	Paravitrea lamellidens (Lamellate Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea lamellidens (Lamellate Supercoil)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Paravitrea lamellidens (Lamellate Supercoil)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Paravitrea lamellidens (Lamellate Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea lapilla (Gem Supercoil)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Gastropod	Paravitrea lapilla (Gem Supercoil)	South-Central Interior Mesophytic Forest			Suit			
Gastropod	Paravitrea lapilla (Gem Supercoil)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Paravitrea metallacta (Caney Fork Supercoil)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Paravitrea metallacta (Caney Fork Supercoil)	South-Central Interior Mesophytic Forest			Suit			
Gastropod	Paravitrea metallacta (Caney Fork Supercoil)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Gastropod	Paravitrea metallacta (Caney Fork Supercoil)	Eastern Highland Rim Prairie and Barrens			Marg			
Gastropod	Paravitrea metallacta (Caney Fork Supercoil)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Interior Calcareous Cliff					Suit	Suit
Gastropod	Paravitrea petrophila (Cherokee Supercoil)	Southern Interior Sinkhole Wall					Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Gastropod	Paravitrea placentula (Glossy Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Gastropod	Paravitrea placentula (Glossy Supercoil)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern and Central Appalachian Cove Forest					Suit	Suit
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern Appalachian Oak Forest					Marg	Marg
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern Appalachian Low-Elevation Pine Forest					Marg	Marg
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Gastropod	Paravitrea placentula (Glossy Supercoil)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Gastropod	Paravitrea placentula (Glossy Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Gastropod	Paravitrea placentula (Glossy Supercoil)	Southern Interior Calcareous Cliff					Suit	Suit
Gastropod	Paravitrea reesei (Round Supercoil)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Paravitrea reesei (Round Supercoil)	Southern Appalachian Oak Forest						Suit
Gastropod	Paravitrea reesei (Round Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea reesei (Round Supercoil)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Paravitrea reesei (Round Supercoil)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Paravitrea reesei (Round Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea subtilis (Slender Supercoil)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Gastropod	Paravitrea subtilis (Slender Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Gastropod	Paravitrea subtilis (Slender Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Gastropod	Paravitrea subtilis (Slender Supercoil)	South-Central Interior Mesophytic Forest			Suit	Suit		
Gastropod	Paravitrea subtilis (Slender Supercoil)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Paravitrea subtilis (Slender Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Paravitrea subtilis (Slender Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Paravitrea subtilis (Slender Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern Appalachian Oak Forest					Suit	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern Interior Calcareous Cliff					Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Paravitrea tantilla (Teasing Supercoil)	Southern Interior Sinkhole Wall					Suit	
Gastropod	Paravitrea ternaria (Sculpted Supercoil)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Paravitrea ternaria (Sculpted Supercoil)	Southern Appalachian Oak Forest						Suit
Gastropod	Paravitrea ternaria (Sculpted Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea ternaria (Sculpted Supercoil)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Paravitrea ternaria (Sculpted Supercoil)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Paravitrea ternaria (Sculpted Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea tridens (White-foot Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Paravitrea tridens (White-foot Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Paravitrea tridens (White-foot Supercoil)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Paravitrea tridens (White-foot Supercoil)	Southern and Central Appalachian Cove Forest					Suit	Suit
Gastropod	Paravitrea tridens (White-foot Supercoil)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Paravitrea tridens (White-foot Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea tridens (White-foot Supercoil)	Southern Appalachian Low-Elevation Pine Forest					Marg	Marg
Gastropod	Paravitrea tridens (White-foot Supercoil)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Gastropod	Paravitrea tridens (White-foot Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Gastropod	Paravitrea umbilicaris (Open Supercoil)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Paravitrea umbilicaris (Open Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Gastropod	Paravitrea variabilis (Variable Supercoil)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Paravitrea variabilis (Variable Supercoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Paravitrea variabilis (Variable Supercoil)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Paravitrea variabilis (Variable Supercoil)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Paravitrea variabilis (Variable Supercoil)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Paravitrea variabilis (Variable Supercoil)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Paravitrea variabilis (Variable Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Paravitrea varidens (Roan Supercoil)	Southern and Central Appalachian Cove Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Paravitrea varidens (Roan Supercoil)	Southern Appalachian Oak Forest						Suit
Gastropod	Paravitrea varidens (Roan Supercoil)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Paravitrea varidens (Roan Supercoil)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Paravitrea varidens (Roan Supercoil)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Paravitrea varidens (Roan Supercoil)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Paravitrea varidens (Roan Supercoil)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Paravitrea varidens (Roan Supercoil)	Southern Appalachian Grass and Shrub Bald						Suit
Gastropod	Patera clarki (Dwarf Proud Globe)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Patera clarki (Dwarf Proud Globe)	Southern Appalachian Oak Forest						Suit
Gastropod	Patera clarki (Dwarf Proud Globe)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Patera clarki (Dwarf Proud Globe)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Patera clarki (Dwarf Proud Globe)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Patera clarki (Dwarf Proud Globe)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Patera clarki (Dwarf Proud Globe)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Philomycus sellatus (Alabama Mantleslug)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Philomycus sellatus (Alabama Mantleslug)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Philomycus sellatus (Alabama Mantleslug)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Philomycus sellatus (Alabama Mantleslug)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Philomycus sellatus (Alabama Mantleslug)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Philomycus sellatus (Alabama Mantleslug)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Philomycus sellatus (Alabama Mantleslug)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Southern Appalachian Oak Forest					Suit	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Southern Appalachian Low-Elevation Pine Forest					Marg	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Southern Appalachian Montane Pine Forest and Woodland					Marg	
Gastropod	Philomycus virginicus (Virginia Mantleslug)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Pilsbryna aurea (Ornate Bud)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Pilsbryna aurea (Ornate Bud)	Southern Appalachian Oak Forest						Suit
Gastropod	Pilsbryna aurea (Ornate Bud)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Pilsbryna aurea (Ornate Bud)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Pilsbryna aurea (Ornate Bud)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Pilsbryna aurea (Ornate Bud)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Pilsbryna castanea (Prominent Bud)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Pilsbryna castanea (Prominent Bud)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Pilsbryna castanea (Prominent Bud)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Pilsbryna castanea (Prominent Bud)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Pilsbryna castanea (Prominent Bud)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Pilsbryna castanea (Prominent Bud)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Pilsbryna castanea (Prominent Bud)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Pilsbryna vanattai (Honey Glyph)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Pilsbryna vanattai (Honey Glyph)	Southern Appalachian Oak Forest						Suit
Gastropod	Pilsbryna vanattai (Honey Glyph)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Pilsbryna vanattai (Honey Glyph)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Pilsbryna vanattai (Honey Glyph)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Pilsbryna vanattai (Honey Glyph)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Gastropod	Pilsbryna vanattai (Honey Glyph)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Stenotrema altispira (Highland Slitmouth)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Stenotrema altispira (Highland Slitmouth)	Southern Appalachian Oak Forest						Suit
Gastropod	Stenotrema altispira (Highland Slitmouth)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Stenotrema altispira (Highland Slitmouth)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Stenotrema altispira (Highland Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Stenotrema altispira (Highland Slitmouth)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Stenotrema altispira (Highland Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	South-Central Interior Mesophytic Forest			Suit	Suit		
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg		
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Stenotrema angellum (Kentucky Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Southern Appalachian Oak Forest					Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Southern Appalachian Low-Elevation Pine Forest				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Southern Ridge and Valley Patch Prairie					Marg	
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Gastropod	Stenotrema calvescens (Chattanooga Slitmouth)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Gastropod	Stenotrema cohuttense (Cohutta Slitmouth)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Stenotrema cohuttense (Cohutta Slitmouth)	Southern Appalachian Oak Forest						Suit
Gastropod	Stenotrema cohuttense (Cohutta Slitmouth)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Stenotrema cohuttense (Cohutta Slitmouth)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Stenotrema cohuttense (Cohutta Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Stenotrema cohuttense (Cohutta Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Southern Appalachian Oak Forest						Suit
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Stenotrema depilatum (Great Smoky Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Stenotrema edgarianum (Sequatchie Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern Appalachian Oak Forest					Marg	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Suit	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Marg	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Stenotrema exodon (Alabama Slitmouth)	Southern Interior Calcareous Cliff					Suit	
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Gastropod	Stenotrema magnafumosum (Appalachian Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Gastropod	Stenotrema pilula (Pygmy Slitmouth)	Southern and Central Appalachian Cove Forest						Marg
Gastropod	Stenotrema pilula (Pygmy Slitmouth)	Southern Appalachian Oak Forest						Suit
Gastropod	Stenotrema pilula (Pygmy Slitmouth)	Southern Appalachian Northern Hardwood Forest						Marg
Gastropod	Stenotrema pilula (Pygmy Slitmouth)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Stenotrema pilula (Pygmy Slitmouth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Stenotrema pilula (Pygmy Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest						Marg
Gastropod	Stenotrema waldense (Doaks Creek Slitmouth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Gastropod	Stenotrema waldense (Doaks Creek Slitmouth)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Gastropod	Stenotrema waldense (Doaks Creek Slitmouth)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Stenotrema waldense (Doaks Creek Slitmouth)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Stenotrema waldense (Doaks Creek Slitmouth)	Appalachian (Hemlock)-Northern Hardwood Forest					Marg	
Gastropod	Stenotrema waldense (Doaks Creek Slitmouth)	Southern Interior Calcareous Cliff					Suit	
Gastropod	Striatura exigua (Ribbed Striate)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Striatura exigua (Ribbed Striate)	Southern Appalachian Oak Forest						Marg
Gastropod	Striatura exigua (Ribbed Striate)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Striatura exigua (Ribbed Striate)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Striatura exigua (Ribbed Striate)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Striatura exigua (Ribbed Striate)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Succinea greerii (Dryland Ambersnail)	Central Interior Acidic Cliff and Talus			Suit			
Gastropod	Succinea greerii (Dryland Ambersnail)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Triodopsis anteridon (Carter Threetooth)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Triodopsis anteridon (Carter Threetooth)	Southern Appalachian Oak Forest						Suit
Gastropod	Triodopsis anteridon (Carter Threetooth)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Triodopsis anteridon (Carter Threetooth)	Southern Appalachian Low-Elevation Pine Forest						Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Triodopsis anteridon (Carter Threetooth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Triodopsis anteridon (Carter Threetooth)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Southern Appalachian Oak Forest					Suit	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Southern Appalachian Low-Elevation Pine Forest					Marg	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Southern Appalachian Montane Pine Forest and Woodland					Marg	
Gastropod	Triodopsis claibornensis (Claiborne Threetooth)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Ventridens coelaxis (Bidentate Dome)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Ventridens coelaxis (Bidentate Dome)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern and Central Appalachian Cove Forest					Suit	Suit
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern Appalachian Low-Elevation Pine Forest					Marg	Marg
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern Appalachian Montane Pine Forest and Woodland					Marg	Marg
Gastropod	Ventridens coelaxis (Bidentate Dome)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Ventridens coelaxis (Bidentate Dome)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	Suit
Gastropod	Ventridens coelaxis (Bidentate Dome)	Southern Interior Sinkhole Wall					Suit	Suit
Gastropod	Ventridens decussatus (Crossed Dome)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Ventridens decussatus (Crossed Dome)	Southern Appalachian Oak Forest						Suit
Gastropod	Ventridens decussatus (Crossed Dome)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Ventridens decussatus (Crossed Dome)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Ventridens decussatus (Crossed Dome)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Ventridens decussatus (Crossed Dome)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Ventridens decussatus (Crossed Dome)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Ventridens eutropis (Carinate Dome)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Ventridens eutropis (Carinate Dome)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Ventridens eutropis (Carinate Dome)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Ventridens eutropis (Carinate Dome)	South-Central Interior Mesophytic Forest			Suit	Suit		
Gastropod	Ventridens eutropis (Carinate Dome)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Ventridens eutropis (Carinate Dome)	Southern Appalachian Low-Elevation Pine Forest				Marg		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Ventridens eutropis (Carinate Dome)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Ventridens eutropis (Carinate Dome)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Gastropod	Ventridens lasmodon (Hollow Dome)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Gastropod	Ventridens lasmodon (Hollow Dome)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Gastropod	Ventridens lasmodon (Hollow Dome)	South-Central Interior Mesophytic Forest				Suit	Suit	
Gastropod	Ventridens lasmodon (Hollow Dome)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Gastropod	Ventridens lasmodon (Hollow Dome)	Southern Appalachian Oak Forest					Suit	Suit
Gastropod	Ventridens lasmodon (Hollow Dome)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Ventridens lasmodon (Hollow Dome)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Gastropod	Ventridens lasmodon (Hollow Dome)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Gastropod	Ventridens lasmodon (Hollow Dome)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Gastropod	Ventridens lasmodon (Hollow Dome)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Gastropod	Ventridens percallosus (Tennessee Dome)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Gastropod	Ventridens percallosus (Tennessee Dome)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Gastropod	Ventridens percallosus (Tennessee Dome)	South-Central Interior Mesophytic Forest					Suit	
Gastropod	Ventridens percallosus (Tennessee Dome)	Southern and Central Appalachian Cove Forest					Suit	
Gastropod	Ventridens percallosus (Tennessee Dome)	Southern Appalachian Oak Forest					Suit	
Gastropod	Ventridens percallosus (Tennessee Dome)	Southern Appalachian Low-Elevation Pine Forest					Marg	
Gastropod	Ventridens percallosus (Tennessee Dome)	Southern Appalachian Montane Pine Forest and Woodland					Marg	
Gastropod	Ventridens percallosus (Tennessee Dome)	Appalachian (Hemlock)-Northern Hardwood Forest					Suit	
Gastropod	Ventridens percallosus (Tennessee Dome)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Vertigo clappi (Cupped Vertigo)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Vertigo clappi (Cupped Vertigo)	Southern Appalachian Oak Forest						Suit
Gastropod	Vertigo clappi (Cupped Vertigo)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Vertigo clappi (Cupped Vertigo)	Southern Appalachian Low-Elevation Pine Forest						Marg
Gastropod	Vertigo clappi (Cupped Vertigo)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Gastropod	Vertigo clappi (Cupped Vertigo)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Vertigo parvula (Smallmouth Vertigo)	Southern and Central Appalachian Cove Forest						Suit
Gastropod	Vertigo parvula (Smallmouth Vertigo)	Southern Appalachian Oak Forest						Suit
Gastropod	Vertigo parvula (Smallmouth Vertigo)	Southern Appalachian Northern Hardwood Forest						Suit
Gastropod	Vertigo parvula (Smallmouth Vertigo)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Gastropod	Vertigo teskeyae (Swamp Vertigo)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Gastropod	Vertigo teskeyae (Swamp Vertigo)	South-Central Interior Small Stream and Riparian			Suit			
Gastropod	Vertigo teskeyae (Swamp Vertigo)	South-Central Interior Large Floodplain			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Gastropod	Vertigo teskeyae (Swamp Vertigo)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Vertigo teskeyae (Swamp Vertigo)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Vertigo teskeyae (Swamp Vertigo)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Gastropod	Webbhelix multilineata (Striped Whitelip)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Gastropod	Webbhelix multilineata (Striped Whitelip)	Mississippi River Riparian Forest	Suit					
Gastropod	Webbhelix multilineata (Striped Whitelip)	Mississippi River Bottomland Depression	Pref					
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Xolotrema obstrictum (Sharp Wedge)	South-Central Interior Mesophytic Forest			Suit	Suit		
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg		
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Central Interior Highlands Calcareous Glade and Barrens				Marg		
Gastropod	Xolotrema obstrictum (Sharp Wedge)	Central Interior Calcareous Cliff and Talus			Suit			
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	South-Central Interior Mesophytic Forest				Suit		
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	Southern and Central Appalachian Cove Forest				Suit		
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	Southern Appalachian Low-Elevation Pine Forest				Marg		
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	Southern Appalachian Montane Pine Forest and Woodland				Marg		
Gastropod	Zonitoides lateumbilicatus (Striate Gloss)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Limestone Forest		Suit				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	South-Central Interior Mesophytic Forest		Suit				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	Mississippi River Riparian Forest	Pref					
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	Mississippi River Bottomland Depression	Suit					
Insect	Amblyscirtes linda (Linda's Roadside Skipper)	South-Central Interior Small Stream and Riparian		Suit				
Insect	Callophrys irus (Frosted Elfin)	Central Interior Highlands Dry Acidic Glade and Barrens			Pref			
Insect	Callophrys irus (Frosted Elfin)	Appalachian Shale Barrens				Suit	Suit	
Insect	Callophrys irus (Frosted Elfin)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit	Suit	
Insect	Callophrys irus (Frosted Elfin)	Nashville Basin Limestone Glade and Woodland			Suit			
Insect	Callophrys irus (Frosted Elfin)	Cumberland Sandstone Glade and Barrens				Suit		
Insect	Callophrys irus (Frosted Elfin)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Insect	Callophrys irus (Frosted Elfin)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Insect	Callophrys irus (Frosted Elfin)	Western Highland Rim Prairie and Barrens			Suit			
Insect	Callophrys irus (Frosted Elfin)	Eastern Highland Rim Prairie and Barrens			Suit			
Insect	Callophrys irus (Frosted Elfin)	Southern Ridge and Valley Patch Prairie					Suit	
Insect	Callophrys irus (Frosted Elfin)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Insect	Callophrys irus (Frosted Elfin)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Cicindela ancocisconensis ((a tiger beetle))	Cumberland Riverscour				Pref		
Insect	Cicindela ancocisconensis ((a tiger beetle))	South-Central Interior Small Stream and Riparian				Suit		
Insect	Cicindela ancocisconensis ((a tiger beetle))	South-Central Interior Large Floodplain				Suit		
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Limestone Forest		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	South-Central Interior Mesophytic Forest		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Insect	Nicrophorus americanus (American Burying Beetle)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Nicrophorus americanus (American Burying Beetle)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Nicrophorus americanus (American Burying Beetle)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Insect	Nicrophorus americanus (American Burying Beetle)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Insect	Nicrophorus americanus (American Burying Beetle)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Nicrophorus americanus (American Burying Beetle)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Southern and Central Appalachian Cove Forest						Marg
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Southern Appalachian Oak Forest						Marg
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Southern Appalachian Northern Hardwood Forest						Suit
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Southern Appalachian Low-Elevation Pine Forest						Marg
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Insect	Semiothisa fraserata (Fraser Fir Geometrid Moth)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Speyeria diana (Diana Fritillary)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Insect	Speyeria diana (Diana Fritillary)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Insect	Speyeria diana (Diana Fritillary)	South-Central Interior Mesophytic Forest				Suit	Suit	
Insect	Speyeria diana (Diana Fritillary)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Insect	Speyeria diana (Diana Fritillary)	Southern Appalachian Oak Forest					Marg	Marg
Insect	Speyeria diana (Diana Fritillary)	Southern Appalachian Northern Hardwood Forest						Suit
Insect	Speyeria diana (Diana Fritillary)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Insect	Speyeria diana (Diana Fritillary)	Appalachian Shale Barrens				Marg	Marg	Marg
Insect	Speyeria diana (Diana Fritillary)	Central Interior Highlands Calcareous Glade and Barrens				Suit	Suit	
Insect	Speyeria diana (Diana Fritillary)	Cumberland Sandstone Glade and Barrens				Suit		
Insect	Speyeria diana (Diana Fritillary)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Insect	Speyeria diana (Diana Fritillary)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Insect	Speyeria diana (Diana Fritillary)	Southern Ridge and Valley Patch Prairie					Suit	
Insect	Speyeria diana (Diana Fritillary)	Cumberland Riverscour				Marg		
Insect	Speyeria diana (Diana Fritillary)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit
Insect	Speyeria diana (Diana Fritillary)	South-Central Interior Large Floodplain				Suit	Suit	Suit
Insect	Speyeria diana (Diana Fritillary)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Speyeria diana (Diana Fritillary)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Insect	Speyeria diana (Diana Fritillary)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Speyeria diana (Diana Fritillary)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Insect	Speyeria diana (Diana Fritillary)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Condylura cristata (Star-nosed Mole)	Southern and Central Appalachian Bog and Fen						Suit
Mammal	Condylura cristata (Star-nosed Mole)	Southern Appalachian Seepage Wetland						Suit
Mammal	Condylura cristata (Star-nosed Mole)	South-Central Interior Small Stream and Riparian						Pref
Mammal	Condylura cristata (Star-nosed Mole)	South-Central Interior Large Floodplain						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Glaucomys sabrinus coloratus (Carolina Northern Flying Squirrel)	Southern and Central Appalachian Cove Forest						Suit
Mammal	Glaucomys sabrinus coloratus (Carolina Northern Flying Squirrel)	Southern Appalachian Oak Forest						Suit
Mammal	Glaucomys sabrinus coloratus (Carolina Northern Flying Squirrel)	Southern Appalachian Northern Hardwood Forest						Pref
Mammal	Glaucomys sabrinus coloratus (Carolina Northern Flying Squirrel)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Mammal	Glaucomys sabrinus coloratus (Carolina Northern Flying Squirrel)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Mammal	Glaucomys sabrinus coloratus (Carolina Northern Flying Squirrel)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Mammal	Martes pennanti (Fisher)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Mammal	Martes pennanti (Fisher)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Mammal	Martes pennanti (Fisher)	South-Central Interior Mesophytic Forest				Suit		
Mammal	Martes pennanti (Fisher)	Southern and Central Appalachian Cove Forest				Suit		Suit
Mammal	Martes pennanti (Fisher)	Southern Appalachian Oak Forest						Suit
Mammal	Martes pennanti (Fisher)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Martes pennanti (Fisher)	Southern Appalachian Low-Elevation Pine Forest				Suit		Suit
Mammal	Martes pennanti (Fisher)	Southern Appalachian Montane Pine Forest and Woodland				Suit		Suit
Mammal	Martes pennanti (Fisher)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Mammal	Martes pennanti (Fisher)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		Suit
Mammal	Martes pennanti (Fisher)	Cumberland Riverscour				Marg		
Mammal	Martes pennanti (Fisher)	South-Central Interior Small Stream and Riparian				Pref		Pref
Mammal	Martes pennanti (Fisher)	South-Central Interior Large Floodplain				Pref		Pref
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Southern and Central Appalachian Cove Forest						Suit
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Southern Appalachian Oak Forest						Suit
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Southern Appalachian Northern Hardwood Forest						Pref
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Southern Appalachian Low-Elevation Pine Forest						Marg
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Southern Appalachian Montane Pine Forest and Woodland						Marg
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	South-Central Interior Small Stream and Riparian						Pref
Mammal	Microtus chrotorrhinus carolinensis (Southern Rock Vole)	South-Central Interior Large Floodplain						Suit
Mammal	Mustela nivalis (Least Weasel)	Appalachian Shale Barrens				Marg	Suit	Marg
Mammal	Mustela nivalis (Least Weasel)	Central Interior Highlands Calcareous Glade and Barrens				Suit	Suit	
Mammal	Mustela nivalis (Least Weasel)	Cumberland Sandstone Glade and Barrens				Suit		
Mammal	Mustela nivalis (Least Weasel)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Mammal	Mustela nivalis (Least Weasel)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Mammal	Mustela nivalis (Least Weasel)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Mustela nivalis (Least Weasel)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Mustela nivalis (Least Weasel)	South-Central Interior Large Floodplain				Suit	Suit	Suit
Mammal	Mustela nivalis (Least Weasel)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Mustela nivalis (Least Weasel)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Mustela nivalis (Least Weasel)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Mustela nivalis (Least Weasel)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Mustela nivalis (Least Weasel)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	South-Central Interior Mesophytic Forest				Suit	Suit	
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Southern Appalachian Oak Forest					Marg	Suit
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Mammal	Napaeozapus insignis (Woodland Jumping Mouse)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern and Central Appalachian Cove Forest						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern Appalachian Oak Forest						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern and Central Appalachian Bog and Fen						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern Appalachian Seepage Wetland						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	South-Central Interior Small Stream and Riparian						Pref
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	South-Central Interior Large Floodplain						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern Appalachian Montane Cliff and Talus						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern Interior Calcareous Cliff						Suit
Mammal	Neotoma floridana haematoreia (Southern Appalachian Woodrat)	Southern Interior Sinkhole Wall						Suit
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Limestone Forest		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	South-Central Interior Mesophytic Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	Mississippi River Riparian Forest	Suit					
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	East Gulf Coastal Plain Northern Seepage Swamp		Pref				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	Mississippi River Bottomland Depression	Pref					
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Mammal	Neotoma floridana illinoensis (Eastern Woodrat)	South-Central Interior Small Stream and Riparian		Suit				
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Mammal	Neotoma magister (Allegheny Woodrat)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Mammal	Neotoma magister (Allegheny Woodrat)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Mammal	Neotoma magister (Allegheny Woodrat)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	South-Central Interior Small Stream and Riparian			Suit	Suit	Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Mammal	Neotoma magister (Allegheny Woodrat)	Central Interior Acidic Cliff and Talus			Pref			
Mammal	Neotoma magister (Allegheny Woodrat)	Central Interior Calcareous Cliff and Talus			Pref			
Mammal	Neotoma magister (Allegheny Woodrat)	Cumberland Acidic Cliff and Rockhouse				Marg	Marg	
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Appalachian Montane Cliff and Talus				Pref	Pref	Pref
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Interior Calcareous Cliff					Marg	Marg
Mammal	Neotoma magister (Allegheny Woodrat)	Southern Interior Sinkhole Wall			Suit		Suit	Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Mammal	Ochrotomys nuttalli (Golden Mouse)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Mammal	Ochrotomys nuttalli (Golden Mouse)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Limestone Forest		Suit				
Mammal	Ochrotomys nuttalli (Golden Mouse)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Mammal	Ochrotomys nuttalli (Golden Mouse)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Mammal	Ochrotomys nuttalli (Golden Mouse)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Mammal	Ochrotomys nuttalli (Golden Mouse)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Mammal	Ochrotomys nuttalli (Golden Mouse)	Western Highland Rim Prairie and Barrens			Pref			
Mammal	Ochrotomys nuttalli (Golden Mouse)	Eastern Highland Rim Prairie and Barrens			Pref			
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Ridge and Valley Patch Prairie					Pref	
Mammal	Ochrotomys nuttalli (Golden Mouse)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Mammal	Ochrotomys nuttalli (Golden Mouse)	Mississippi River Riparian Forest	Suit					
Mammal	Ochrotomys nuttalli (Golden Mouse)	Cumberland Seepage Forest				Suit		
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	Mississippi River Bottomland Depression	Suit					
Mammal	Ochrotomys nuttalli (Golden Mouse)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Mammal	Ochrotomys nuttalli (Golden Mouse)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Mammal	Ochrotomys nuttalli (Golden Mouse)	Interior Low Plateau Seepage Fen			Suit			
Mammal	Ochrotomys nuttalli (Golden Mouse)	Southern Appalachian Seepage Wetland						Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Ochrotomys nuttalli (Golden Mouse)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Ochrotomys nuttalli (Golden Mouse)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Ochrotomys nuttalli (Golden Mouse)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Ochrotomys nuttalli (Golden Mouse)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Ochrotomys nuttalli (Golden Mouse)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Parascalops breweri (Hairy-tailed Mole)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Mammal	Parascalops breweri (Hairy-tailed Mole)	South-Central Interior Mesophytic Forest				Suit	Suit	
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern Appalachian Low-Elevation Pine Forest					Marg	
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern Appalachian Montane Pine Forest and Woodland					Marg	
Mammal	Parascalops breweri (Hairy-tailed Mole)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Parascalops breweri (Hairy-tailed Mole)	Southern Ridge and Valley Patch Prairie					Marg	
Mammal	Parascalops breweri (Hairy-tailed Mole)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Parascalops breweri (Hairy-tailed Mole)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Parascalops breweri (Hairy-tailed Mole)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Parascalops breweri (Hairy-tailed Mole)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex cinereus (Cinereus Shrew)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Mammal	Sorex cinereus (Cinereus Shrew)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Mammal	Sorex cinereus (Cinereus Shrew)	South-Central Interior Mesophytic Forest				Suit	Suit	
Mammal	Sorex cinereus (Cinereus Shrew)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Sorex cinereus (Cinereus Shrew)	Cumberland Seepage Forest				Suit		
Mammal	Sorex cinereus (Cinereus Shrew)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit	Suit	
Mammal	Sorex cinereus (Cinereus Shrew)	Southern Appalachian Seepage Wetland						Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex cinereus (Cinereus Shrew)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex cinereus (Cinereus Shrew)	Urban / Suburban Managed Grassland	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex cinereus (Cinereus Shrew)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex dispar (Long-tailed Shrew)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Mammal	Sorex dispar (Long-tailed Shrew)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Mammal	Sorex dispar (Long-tailed Shrew)	South-Central Interior Mesophytic Forest				Suit	Suit	
Mammal	Sorex dispar (Long-tailed Shrew)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Sorex dispar (Long-tailed Shrew)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Sorex dispar (Long-tailed Shrew)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Sorex dispar (Long-tailed Shrew)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Sorex dispar (Long-tailed Shrew)	South-Central Interior Small Stream and Riparian				Pref	Pref	Pref
Mammal	Sorex dispar (Long-tailed Shrew)	South-Central Interior Large Floodplain				Suit	Suit	Suit
Mammal	Sorex dispar (Long-tailed Shrew)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Mammal	Sorex fumeus (Smoky Shrew)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Mammal	Sorex fumeus (Smoky Shrew)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Mammal	Sorex fumeus (Smoky Shrew)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Mammal	Sorex fumeus (Smoky Shrew)	South-Central Interior Mesophytic Forest			Pref	Suit	Suit	
Mammal	Sorex fumeus (Smoky Shrew)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Sorex fumeus (Smoky Shrew)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Sorex fumeus (Smoky Shrew)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Sorex fumeus (Smoky Shrew)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Mammal	Sorex fumeus (Smoky Shrew)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Mammal	Sorex fumeus (Smoky Shrew)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref	Pref	Pref
Mammal	Sorex fumeus (Smoky Shrew)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Mammal	Sorex fumeus (Smoky Shrew)	Western Highland Rim Prairie and Barrens			Suit			
Mammal	Sorex fumeus (Smoky Shrew)	Eastern Highland Rim Prairie and Barrens			Suit			
Mammal	Sorex fumeus (Smoky Shrew)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Sorex fumeus (Smoky Shrew)	Cumberland Seepage Forest				Suit		
Mammal	Sorex fumeus (Smoky Shrew)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Mammal	Sorex fumeus (Smoky Shrew)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Mammal	Sorex fumeus (Smoky Shrew)	Interior Low Plateau Seepage Fen			Suit			
Mammal	Sorex fumeus (Smoky Shrew)	Southern Appalachian Seepage Wetland						Suit
Mammal	Sorex fumeus (Smoky Shrew)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Mammal	Sorex hoyi (American Pygmy Shrew)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Mammal	Sorex hoyi (American Pygmy Shrew)	South-Central Interior Mesophytic Forest				Pref	Pref	
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Appalachian Northern Hardwood Forest						Pref
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	Marg
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Sorex hoyi (American Pygmy Shrew)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Sorex hoyi (American Pygmy Shrew)	Cumberland Seepage Forest				Suit		
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit	Suit	
Mammal	Sorex hoyi (American Pygmy Shrew)	Southern Appalachian Seepage Wetland						Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	South-Central Interior Large Floodplain				Suit	Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex hoyi (American Pygmy Shrew)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex hoyi (American Pygmy Shrew)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex hoyi (American Pygmy Shrew)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Mammal	Sorex longirostris (Southeastern Shrew)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Limestone Forest		Marg				
Mammal	Sorex longirostris (Southeastern Shrew)	South-Central Interior Mesophytic Forest		Suit	Suit	Pref	Pref	
Mammal	Sorex longirostris (Southeastern Shrew)	Southern and Central Appalachian Cove Forest				Pref	Pref	Suit
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Appalachian Oak Forest					Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Mammal	Sorex longirostris (Southeastern Shrew)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	Pennyroyal Karst Plain Prairie and Barrens			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Sorex longirostris (Southeastern Shrew)	Western Highland Rim Prairie and Barrens			Suit			
Mammal	Sorex longirostris (Southeastern Shrew)	Eastern Highland Rim Prairie and Barrens			Suit			
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Sorex longirostris (Southeastern Shrew)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Mammal	Sorex longirostris (Southeastern Shrew)	Mississippi River Riparian Forest	Pref					
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	Cumberland Seepage Forest				Suit		
Mammal	Sorex longirostris (Southeastern Shrew)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Mammal	Sorex longirostris (Southeastern Shrew)	Mississippi River Bottomland Depression	Suit					
Mammal	Sorex longirostris (Southeastern Shrew)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Mammal	Sorex longirostris (Southeastern Shrew)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Mammal	Sorex longirostris (Southeastern Shrew)	Interior Low Plateau Seepage Fen			Suit			
Mammal	Sorex longirostris (Southeastern Shrew)	Southern Appalachian Seepage Wetland						Suit
Mammal	Sorex longirostris (Southeastern Shrew)	South-Central Interior Small Stream and Riparian		Suit	Pref	Pref	Pref	Pref
Mammal	Sorex longirostris (Southeastern Shrew)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Mammal	Sorex longirostris (Southeastern Shrew)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex longirostris (Southeastern Shrew)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sorex longirostris (Southeastern Shrew)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex longirostris (Southeastern Shrew)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex longirostris (Southeastern Shrew)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Sorex palustris (American Water Shrew)	Southern and Central Appalachian Bog and Fen						Suit
Mammal	Sorex palustris (American Water Shrew)	Southern Appalachian Seepage Wetland						Suit
Mammal	Sorex palustris (American Water Shrew)	South-Central Interior Small Stream and Riparian						Pref
Mammal	Sorex palustris (American Water Shrew)	South-Central Interior Large Floodplain						Suit
Mammal	Sorex palustris (American Water Shrew)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Limestone Forest		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Pref	
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern and Central Appalachian Cove Forest				Suit	Suit	Pref
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Appalachian Oak Forest					Suit	Suit
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Appalachian Low-Elevation Pine Forest			Suit	Marg	Marg	Marg
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref	Pref	Pref
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Marg			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Nashville Basin Limestone Glade and Woodland			Marg			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Marg				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Pennyroyal Karst Plain Prairie and Barrens			Marg			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Western Highland Rim Prairie and Barrens			Marg			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Eastern Highland Rim Prairie and Barrens			Marg			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Central Interior Acidic Cliff and Talus			Suit			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Central Interior Calcareous Cliff and Talus			Suit			
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Pasture	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Spilogale putorius (Eastern Spotted Skunk)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Sylvilagus transitionalis (Appalachian Cottontail)	Southern and Central Appalachian Cove Forest						Marg
Mammal	Sylvilagus transitionalis (Appalachian Cottontail)	Southern Appalachian Oak Forest						Marg
Mammal	Sylvilagus transitionalis (Appalachian Cottontail)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Sylvilagus transitionalis (Appalachian Cottontail)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Mammal	Sylvilagus transitionalis (Appalachian Cottontail)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Mammal	Sylvilagus transitionalis (Appalachian Cottontail)	Southern Appalachian Grass and Shrub Bald						Suit
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Southern Appalachian Oak Forest					Marg	Suit
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Western Highland Rim Prairie and Barrens			Suit			
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Eastern Highland Rim Prairie and Barrens			Suit			
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	East Gulf Coastal Plain Northern Seepage Swamp		Pref				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Cumberland Seepage Forest				Pref		
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Mammal	Synaptomys cooperi (Southern Bog Lemming)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref	Pref	
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Interior Low Plateau Seepage Fen			Pref			
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Southern Appalachian Seepage Wetland						Pref
Mammal	Synaptomys cooperi (Southern Bog Lemming)	South-Central Interior Small Stream and Riparian		Marg	Suit	Suit	Suit	Suit
Mammal	Synaptomys cooperi (Southern Bog Lemming)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Mammal	Synaptomys cooperi (Southern Bog Lemming)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Southern and Central Appalachian Cove Forest						Suit
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Southern Appalachian Oak Forest						Marg
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Southern Appalachian Northern Hardwood Forest						Suit
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Southern Appalachian Low-Elevation Pine Forest						Marg
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Southern Appalachian Montane Pine Forest and Woodland						Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Mammal	Tamiasciurus hudsonicus (Red Squirrel)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Western Highland Rim Prairie and Barrens			Suit			
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Eastern Highland Rim Prairie and Barrens			Suit			
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Southern Ridge and Valley Patch Prairie					Suit	
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Cumberland Seepage Forest				Pref		
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Mississippi River Bottomland Depression	Suit					
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref	Pref	
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Interior Low Plateau Seepage Fen			Pref			
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Southern Appalachian Seepage Wetland						Pref
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	South-Central Interior Small Stream and Riparian		Suit	Pref	Pref	Pref	Pref
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Mammal	Zapus hudsonius (Meadow Jumping Mouse)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Abies fraseri (Fraser Fir)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Abies fraseri (Fraser Fir)	Southern Appalachian Grass and Shrub Bald						Marg
Plant	Acalypha deamii (Deam's Copperleaf)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Acalypha deamii (Deam's Copperleaf)	South-Central Interior Mesophytic Forest		Marg	Pref			
Plant	Acalypha deamii (Deam's Copperleaf)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Acalypha deamii (Deam's Copperleaf)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Acalypha deamii (Deam's Copperleaf)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Plant	Acalypha deamii (Deam's Copperleaf)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Plant	Acer leucoderme (Chalk Maple)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Acer leucoderme (Chalk Maple)	South-Central Interior Small Stream and Riparian						Pref

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Acmella oppositifolia (Creeping Spotflower)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Acmella oppositifolia (Creeping Spotflower)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Acmella oppositifolia (Creeping Spotflower)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Acmella oppositifolia (Creeping Spotflower)	Mississippi River Bottomland Depression	Pref					
Plant	Aconitum reclinatum (Trailing Wolfsbane)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Aconitum reclinatum (Trailing Wolfsbane)	Southern Appalachian Seepage Wetland						Pref
Plant	Acrobolbus ciliatus ((a liverwort))	Southern and Central Appalachian Cove Forest						Suit
Plant	Acrobolbus ciliatus ((a liverwort))	South-Central Interior Small Stream and Riparian						Suit
Plant	Acrobolbus ciliatus ((a liverwort))	Southern Appalachian Spray Cliff						Pref
Plant	Adlumia fungosa (Climbing Fumitory)	South-Central Interior Mesophytic Forest				Suit		
Plant	Adlumia fungosa (Climbing Fumitory)	Southern and Central Appalachian Cove Forest				Suit		Suit
Plant	Adlumia fungosa (Climbing Fumitory)	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Adlumia fungosa (Climbing Fumitory)	Southern Appalachian Montane Cliff and Talus				Suit		Suit
Plant	Agalinis auriculata (Earleaved False-foxglove)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Plant	Agalinis auriculata (Earleaved False-foxglove)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Plant	Agalinis auriculata (Earleaved False-foxglove)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Agalinis auriculata (Earleaved False-foxglove)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Agalinis auriculata (Earleaved False-foxglove)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Agalinis heterophylla (Prairie False-foxglove)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Agalinis oligophylla (Ridge-stem False-foxglove)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Agalinis setacea (Thread-leaved Gerardia)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Plant	Agastache scrophulariifolia (Purple Giant Hyssop)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Agastache scrophulariifolia (Purple Giant Hyssop)	Southern Appalachian Grass and Shrub Bald						Marg
Plant	Ageratina luciae-brauniae (Lucy Braun's White Snakeroot)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Agrostis mertensii (Arctic Bentgrass)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Agrostis mertensii (Arctic Bentgrass)	Southern Appalachian Rocky Summit						Pref
Plant	Allium burdickii (Narrow-leaf Ramps)	South-Central Interior Mesophytic Forest			Pref	Pref	Pref	
Plant	Allium burdickii (Narrow-leaf Ramps)	South-Central Interior Small Stream and Riparian			Suit	Suit	Suit	
Plant	Allium stellatum (Glade Onion)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Allium tricoccum (Ramps)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Plant	Allium tricoccum (Ramps)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Plant	Allium tricoccum (Ramps)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Alnus viridis ssp. crispa (Green Alder)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Plant	Alnus viridis ssp. crispa (Green Alder)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Amelanchier sanguinea (Roundleaf Shadbush)	Southern Appalachian Oak Forest						Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Amelanchier sanguinea (Roundleaf Shadbush)	Southern Appalachian Low-Elevation Pine Forest						Suit
Plant	Amelanchier sanguinea (Roundleaf Shadbush)	Cumberland Sandstone Glade and Barrens				Suit		
Plant	Amelanchier sanguinea (Roundleaf Shadbush)	Cumberland Riverscour				Suit		
Plant	Amelanchier sanguinea (Roundleaf Shadbush)	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Ammoselinum popei (Pope's Sand-parsley)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Amsonia tabernaemontana var. gattingeri (Limestone Blue Star)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit	Suit	
Plant	Amsonia tabernaemontana var. gattingeri (Limestone Blue Star)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Amsonia tabernaemontana var. gattingeri (Limestone Blue Star)	South-Central Interior Small Stream and Riparian			Marg			
Plant	Amsonia tabernaemontana var. gattingeri (Limestone Blue Star)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Amsonia tabernaemontana var. gattingeri (Limestone Blue Star)	Southern Interior Calcareous Cliff					Suit	
Plant	Anastrophyllum saxicola ((a liverwort))	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Anastrophyllum saxicola ((a liverwort))	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Anemone caroliniana (Carolina Anemone)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Angelica atropurpurea (Great Angelica)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Plant	Angelica atropurpurea (Great Angelica)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Apios priceana (Price's Potato-bean)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Apios priceana (Price's Potato-bean)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Apios priceana (Price's Potato-bean)	South-Central Interior Mesophytic Forest			Suit	Suit		
Plant	Apios priceana (Price's Potato-bean)	South-Central Interior Small Stream and Riparian			Suit	Suit		
Plant	Arabis hirsuta (Western Hairy Rockcress)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Plant	Arabis hirsuta (Western Hairy Rockcress)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Archidium alternifolium ((a moss))	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Archidium alternifolium ((a moss))	Central Appalachian Alkaline Glade and Woodland					Suit	
Plant	Archidium alternifolium ((a moss))	Southern Ridge and Valley Patch Prairie					Marg	
Plant	Archidium alternifolium ((a moss))	Old Field / Successional					Marg	
Plant	Archidium alternifolium ((a moss))	Pasture					Marg	
Plant	Arenaria lanuginosa (Wooly Sandwort)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Arenaria lanuginosa (Wooly Sandwort)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Plant	Arnoglossum plantagineum (Fen Indian-plantain)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Asclepias purpurascens (Purple Milkweed)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Plant	Asclepias purpurascens (Purple Milkweed)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Asclepias purpurascens (Purple Milkweed)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Asclepias purpurascens (Purple Milkweed)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Plant	Asclepias purpurascens (Purple Milkweed)	Western Highland Rim Prairie and Barrens			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Asclepias purpurascens (Purple Milkweed)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Asplenium scolopendrium var. americanum (Hart's-tongue Fern)	Southern Interior Sinkhole Wall				Suit	Suit	
Plant	Astragalus bibullatus (Pyne's Ground-plum)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Astragalus tennesseensis (Tennessee Milk-vetch)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Athyrium filix-femina ssp. angustum (Northern Lady Fern)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Aureolaria patula (Spreading False-foxglove)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Aureolaria patula (Spreading False-foxglove)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Aureolaria patula (Spreading False-foxglove)	Southern Interior Calcareous Cliff					Suit	
Plant	Bacopa caroliniana (Carolina Water-hyssop)	South-Central Interior Large Floodplain			Marg	Marg	Marg	Marg
Plant	Bacopa caroliniana (Carolina Water-hyssop)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Bacopa caroliniana (Carolina Water-hyssop)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Bacopa caroliniana (Carolina Water-hyssop)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Baptisia bracteata var. leucophaea (Cream Wild-indigo)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Pref			
Plant	Baptisia bracteata var. leucophaea (Cream Wild-indigo)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Bazzania nudicaulis ((a liverwort))	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Berberis canadensis (American Barberry)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref	Pref	
Plant	Berberis canadensis (American Barberry)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Berberis canadensis (American Barberry)	Cumberland Riverscour				Suit		
Plant	Betula papyrifera var. cordifolia (Heart-leaved Paper Birch)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Betula papyrifera var. cordifolia (Heart-leaved Paper Birch)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Boechera patens (Spreading Rockcress)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref	Pref	
Plant	Boechera perstellata (Braun's Rockcress)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Boechera perstellata (Braun's Rockcress)	South-Central Interior Mesophytic Forest			Pref			
Plant	Boechera shortii (Short's Rockcress)	South-Central Interior Mesophytic Forest			Suit			
Plant	Boechera shortii (Short's Rockcress)	South-Central Interior Large Floodplain			Suit			
Plant	Boechera shortii (Short's Rockcress)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Bolboschoenus fluviatilis (River Bulrush)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Plant	Bolboschoenus fluviatilis (River Bulrush)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Botrychium jenmanii (Alabama Grapefern)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Plant	Botrychium jenmanii (Alabama Grapefern)	Southern Appalachian Oak Forest					Marg	Marg
Plant	Botrychium jenmanii (Alabama Grapefern)	Southern Appalachian Low-Elevation Pine Forest				Suit	Suit	Suit
Plant	Botrychium jenmanii (Alabama Grapefern)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Southern and Central Appalachian Cove Forest						Marg
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Southern Appalachian Oak Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Southern Appalachian Low-Elevation Pine Forest						Suit
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Plant	Botrychium matricariifolium (Chamomile Grapefern)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Botrychium oneidense (Blunt-lobed Grapefern)	Southern and Central Appalachian Cove Forest						Suit
Plant	Botrychium oneidense (Blunt-lobed Grapefern)	Southern Appalachian Oak Forest						Suit
Plant	Botrychium oneidense (Blunt-lobed Grapefern)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Botrychium oneidense (Blunt-lobed Grapefern)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Botrychium oneidense (Blunt-lobed Grapefern)	Southern Appalachian Seepage Wetland						Suit
Plant	Botrychium simplex (Least Grape-fern)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Botrychium simplex (Least Grape-fern)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Brachydontium trichodes (Peak Moss)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Brachydontium trichodes (Peak Moss)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Brachydontium trichodes (Peak Moss)	Southern Appalachian Seepage Wetland						Pref
Plant	Brachyelytrum aristosum (Northern Shorthusk)	Southern and Central Appalachian Cove Forest						Pref
Plant	Brachyelytrum aristosum (Northern Shorthusk)	Southern Appalachian Oak Forest						Suit
Plant	Brachyelytrum aristosum (Northern Shorthusk)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Brachyelytrum aristosum (Northern Shorthusk)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Bryoxiphium norvegicum (Sword Moss)	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Bryoxiphium norvegicum (Sword Moss)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Bryoxiphium norvegicum (Sword Moss)	Southern Appalachian Spray Cliff						Pref
Plant	Buckleya distichophylla (Piratebush)	Southern Appalachian Oak Forest					Marg	Pref
Plant	Buckleya distichophylla (Piratebush)	Southern Appalachian Low-Elevation Pine Forest					Marg	Pref
Plant	Buckleya distichophylla (Piratebush)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Plant	Buckleya distichophylla (Piratebush)	South-Central Interior Small Stream and Riparian						Marg
Plant	Calamagrostis cainii (Cain's Reedgrass)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Calamagrostis cainii (Cain's Reedgrass)	Southern Appalachian Rocky Summit						Pref
Plant	Calamagrostis porteri (Porter's Reedgrass)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Calamagrostis porteri (Porter's Reedgrass)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Plant	Calamagrostis porteri (Porter's Reedgrass)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Calamovilfa arcuata (Cumberland Sand-Grass)	Cumberland Riverscour				Pref		
Plant	Caltha palustris (Marsh Marigold)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Caltha palustris (Marsh Marigold)	South-Central Interior Small Stream and Riparian						Suit
Plant	Campanula aparinoides (Marsh Bellflower)	Cumberland Wet-Mesic Meadow and Savanna				Suit		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Campanula aparinoides (Marsh Bellflower)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Campanula aparinoides (Marsh Bellflower)	South-Central Interior Small Stream and Riparian			Suit	Suit	Suit	Suit
Plant	Cardamine clematitis (Mountain Bittercress)	Southern Appalachian Oak Forest						Suit
Plant	Cardamine clematitis (Mountain Bittercress)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Cardamine clematitis (Mountain Bittercress)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Plant	Cardamine clematitis (Mountain Bittercress)	Southern Appalachian Seepage Wetland						Pref
Plant	Cardamine flagellifera (Running Bittercress)	South-Central Interior Mesophytic Forest				Suit	Suit	
Plant	Cardamine flagellifera (Running Bittercress)	Southern and Central Appalachian Cove Forest						Suit
Plant	Cardamine flagellifera (Running Bittercress)	Southern Appalachian Seepage Wetland						Suit
Plant	Cardamine flagellifera (Running Bittercress)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit
Plant	Cardamine rotundifolia (Round-leaf Watercress)	South-Central Interior Mesophytic Forest				Marg	Marg	
Plant	Cardamine rotundifolia (Round-leaf Watercress)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg
Plant	Cardamine rotundifolia (Round-leaf Watercress)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Cardamine rotundifolia (Round-leaf Watercress)	Southern Appalachian Seepage Wetland						Pref
Plant	Cardamine rotundifolia (Round-leaf Watercress)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit
Plant	Cardamine rotundifolia (Round-leaf Watercress)	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Carex argyrantha (Hay Sedge)	Allegheny-Cumberland Dry Oak Forest and Woodland						Marg
Plant	Carex argyrantha (Hay Sedge)	Southern Appalachian Oak Forest						Marg
Plant	Carex argyrantha (Hay Sedge)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Carex argyrantha (Hay Sedge)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Plant	Carex barrattii (Barratt's Sedge)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Carex barrattii (Barratt's Sedge)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Carex bromoides ssp. montana (Blue Ridge Brome Sedge)	Southern and Central Appalachian Cove Forest						Pref
Plant	Carex bromoides ssp. montana (Blue Ridge Brome Sedge)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Plant	Carex buxbaumii (Brown Bog Sedge)	Eastern Highland Rim Prairie and Barrens			Marg			
Plant	Carex buxbaumii (Brown Bog Sedge)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit		
Plant	Carex chapmanii (Chapman's Sedge)	Eastern Highland Rim Prairie and Barrens			Marg			
Plant	Carex chapmanii (Chapman's Sedge)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Plant	Carex comosa (Bristly Sedge)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Carex comosa (Bristly Sedge)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Carex comosa (Bristly Sedge)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Plant	Carex comosa (Bristly Sedge)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Plant	Carex comosa (Bristly Sedge)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit		Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Carex comosa (Bristly Sedge)	Interior Low Plateau Seepage Fen			Suit			
Plant	Carex comosa (Bristly Sedge)	South-Central Interior Small Stream and Riparian		Suit	Suit		Suit	
Plant	Carex comosa (Bristly Sedge)	South-Central Interior Large Floodplain			Suit		Suit	
Plant	Carex comosa (Bristly Sedge)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Carex comosa (Bristly Sedge)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Carex comosa (Bristly Sedge)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Carex davisii (Davis' Sedge)	South-Central Interior Small Stream and Riparian			Suit			
Plant	Carex davisii (Davis' Sedge)	South-Central Interior Large Floodplain			Pref			
Plant	Carex echinata ssp. echinata (Little Prickly Sedge)	Cumberland Seepage Forest				Suit		
Plant	Carex echinata ssp. echinata (Little Prickly Sedge)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Carex echinata ssp. echinata (Little Prickly Sedge)	Southern Appalachian Seepage Wetland						Suit
Plant	Carex echinata ssp. echinata (Little Prickly Sedge)	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Carex folliculata (northern long sedge)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Carex hirtifolia (Pubescent Sedge)	South-Central Interior Small Stream and Riparian			Pref			
Plant	Carex hitchcockiana (Hitchcock's Sedge)	South-Central Interior Mesophytic Forest			Pref			
Plant	Carex hitchcockiana (Hitchcock's Sedge)	Southern and Central Appalachian Cove Forest						Pref
Plant	Carex hyalina (Tissue Sedge)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Plant	Carex lacustris (Lake-bank Sedge)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Plant	Carex lacustris (Lake-bank Sedge)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Carex lacustris (Lake-bank Sedge)	Mississippi River Riparian Forest	Suit					
Plant	Carex lacustris (Lake-bank Sedge)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Carex lacustris (Lake-bank Sedge)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Carex lacustris (Lake-bank Sedge)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Plant	Carex lacustris (Lake-bank Sedge)	Mississippi River Bottomland Depression	Suit					
Plant	Carex lacustris (Lake-bank Sedge)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Plant	Carex lacustris (Lake-bank Sedge)	Interior Low Plateau Seepage Fen			Suit			
Plant	Carex lacustris (Lake-bank Sedge)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Plant	Carex lacustris (Lake-bank Sedge)	South-Central Interior Large Floodplain			Suit			
Plant	Carex lacustris (Lake-bank Sedge)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Carex lacustris (Lake-bank Sedge)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Carex lacustris (Lake-bank Sedge)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Carex lonchocarpa (Southern Long Sedge)	Cumberland Seepage Forest				Pref		
Plant	Carex manhartii (Manhart's Sedge)	Southern and Central Appalachian Cove Forest						Pref
Plant	Carex misera (Wretched Sedge)	Southern Appalachian Rocky Summit						Pref
Plant	Carex ouachitana (Ouachita Sedge)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Carex ouachitana (Ouachita Sedge)	South-Central Interior Mesophytic Forest			Suit			
Plant	Carex pallescens (Pale Sedge)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Carex reniformis (Reniform Sedge)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Carex reniformis (Reniform Sedge)	South-Central Interior Large Floodplain			Suit			
Plant	Carex roanensis (Roan Mountain Sedge)	Southern and Central Appalachian Cove Forest						Suit
Plant	Carex roanensis (Roan Mountain Sedge)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Carex ruthii (Ruth's Sedge)	Southern and Central Appalachian Cove Forest						Suit
Plant	Carex ruthii (Ruth's Sedge)	Southern Appalachian Oak Forest						Suit
Plant	Carex ruthii (Ruth's Sedge)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Carex ruthii (Ruth's Sedge)	Southern Appalachian Seepage Wetland						Pref
Plant	Carex vestita (Velvety Sedge)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Carex x aestivaliformis ((a hybrid sedge))	Southern Appalachian Oak Forest						Pref
Plant	Castanea dentata (American Chestnut)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Plant	Castanea dentata (American Chestnut)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Pref			
Plant	Castanea dentata (American Chestnut)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Plant	Castanea dentata (American Chestnut)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Plant	Castanea dentata (American Chestnut)	Southern Appalachian Oak Forest					Pref	Pref
Plant	Castanea dentata (American Chestnut)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Plant	Castanea dentata (American Chestnut)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Plant	Caulophyllum giganteum (Giant Blue Cohosh)	South-Central Interior Mesophytic Forest			Pref	Suit		
Plant	Caulophyllum giganteum (Giant Blue Cohosh)	Southern and Central Appalachian Cove Forest						Suit
Plant	Cephaloziella massalongi ((a liverwort))	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Cephaloziella massalongi ((a liverwort))	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Cephaloziella massalongi ((a liverwort))	Southern Appalachian Rocky Summit						Pref
Plant	Cephaloziella spinicaulis ((a liverwort))	South-Central Interior Small Stream and Riparian						Suit
Plant	Cerastium velutinum var. velutinum (Velvety Cerastium)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Ceratophyllum echinatum (Prickly Hornwort)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Plant	Ceratophyllum echinatum (Prickly Hornwort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Chelone obliqua (Red Turtlehead)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Chelone obliqua (Red Turtlehead)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Plant	Chrysogonum virginianum (Green-and-gold)	South-Central Interior Mesophytic Forest				Pref	Pref	
Plant	Chrysogonum virginianum (Green-and-gold)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Plant	Chrysogonum virginianum (Green-and-gold)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Cimicifuga rubifolia (Appalachian Bugbane)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Plant	Cimicifuga rubifolia (Appalachian Bugbane)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Cimicifuga rubifolia (Appalachian Bugbane)	Southern Interior Calcareous Cliff					Suit	
Plant	Clematis fremontii (Fremont's Virgin's-bower)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Pref	
Plant	Clematis glaucophylla (White-leaved Leather-flower)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Clematis glaucophylla (White-leaved Leather-flower)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Clematis glaucophylla (White-leaved Leather-flower)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Clematis morefieldii (Morefield's Leather-flower)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref		
Plant	Clematis pitcheri (Pitcher Leather-flower)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Clematis pitcheri (Pitcher Leather-flower)	South-Central Interior Small Stream and Riparian			Suit			
Plant	Clematis pitcheri (Pitcher Leather-flower)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Clethra alnifolia (Coastal Sweet Pepper-bush)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Clethra alnifolia (Coastal Sweet Pepper-bush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Clintonia borealis (Clinton's Lily)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Clintonia borealis (Clinton's Lily)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Coeloglossum viride var. virescens (Long-bracted Green Orchid)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Coeloglossum viride var. virescens (Long-bracted Green Orchid)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Coeloglossum viride var. virescens (Long-bracted Green Orchid)	Southern Appalachian Seepage Wetland						Suit
Plant	Collinsia verna (Spring Blue-eyed Mary)	South-Central Interior Small Stream and Riparian			Pref			
Plant	Cololejeunea ornata (Ornate Cololejeunea)	Southern Appalachian Montane Cliff and Talus				Pref		
Plant	Cololejeunea ornata (Ornate Cololejeunea)	Southern Interior Sinkhole Wall			Pref			
Plant	Comptonia peregrina (Sweet-fern)	Cumberland Riverscour				Suit		
Plant	Conradina verticillata (Cumberland Rosemary)	Cumberland Riverscour				Pref		
Plant	Corallorhiza maculata (Spotted Coralroot)	Southern and Central Appalachian Cove Forest				Pref		Pref
Plant	Corallorhiza maculata (Spotted Coralroot)	Southern Appalachian Oak Forest						Suit
Plant	Corallorhiza maculata (Spotted Coralroot)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Coreopsis delphiniifolia (Larkspur-leaved Coreopsis)	Southern Appalachian Oak Forest						Suit
Plant	Coreopsis delphiniifolia (Larkspur-leaved Coreopsis)	Southern Appalachian Low-Elevation Pine Forest						Suit
Plant	Coreopsis latifolia (Broad-leaved Tickseed)	Southern and Central Appalachian Cove Forest						Suit
Plant	Coreopsis latifolia (Broad-leaved Tickseed)	Southern Appalachian Oak Forest						Marg
Plant	Coreopsis latifolia (Broad-leaved Tickseed)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Corydalis sempervirens (Pale Corydalis)	Cumberland Acidic Cliff and Rockhouse				Marg	Marg	
Plant	Corydalis sempervirens (Pale Corydalis)	Southern Appalachian Montane Cliff and Talus				Marg	Marg	Suit
Plant	Corydalis sempervirens (Pale Corydalis)	Southern Appalachian Rocky Summit						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Cotinus obovatus (American Smoketree)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Cotinus obovatus (American Smoketree)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref		
Plant	Crataegus harbisonii (Harbison's Hawthorn)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Plant	Crataegus harbisonii (Harbison's Hawthorn)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Plant	Cymophyllus fraserianus (Fraser's Sedge)	Southern and Central Appalachian Cove Forest						Pref
Plant	Cyperus dentatus (Toothed Sedge)	South-Central Interior Large Floodplain						Suit
Plant	Cyperus plukenetii (Plukenet's Galingale)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Plant	Cyperus plukenetii (Plukenet's Galingale)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Plant	Cyperus plukenetii (Plukenet's Galingale)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Pref				
Plant	Cyperus plukenetii (Plukenet's Galingale)	Cumberland Sandstone Glade and Barrens				Suit		
Plant	Cypripedium kentuckiense (Southern Lady's-slipper)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref		
Plant	Cypripedium reginae (Showy Lady's-slipper)	Southern Interior Calcareous Cliff					Pref	Pref
Plant	Dalea candida (White Prairie-clover)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit	Suit	
Plant	Dalea candida (White Prairie-clover)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Dalea candida (White Prairie-clover)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Dalea foliosa (Leafy Prairie-clover)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Dalea purpurea (Purple Prairie-clover)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Danthonia epilis (Bog Oat-grass)	Cumberland Riverscour				Pref		
Plant	Danthonia epilis (Bog Oat-grass)	South-Central Interior Small Stream and Riparian				Marg		
Plant	Delphinium exaltatum (Tall Larkspur)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Delphinium exaltatum (Tall Larkspur)	Central Appalachian Alkaline Glade and Woodland					Marg	
Plant	Delphinium exaltatum (Tall Larkspur)	Southern Ridge and Valley Patch Prairie					Pref	
Plant	Desmodium ochroleucum (Creamflower Tick-trefoil)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Plant	Desmodium ochroleucum (Creamflower Tick-trefoil)	Central Interior Highlands Calcareous Glade and Barrens		Pref	Pref	Pref	Pref	
Plant	Desmodium ochroleucum (Creamflower Tick-trefoil)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Diamorpha smallii (Small's Stonecrop)	Cumberland Sandstone Glade and Barrens				Pref		
Plant	Diarrhena obovata (Beak Grass)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Diarrhena obovata (Beak Grass)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Diarrhena obovata (Beak Grass)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Dichanthelium aciculare (Needleleaf Witchgrass)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Dichanthelium acuminatum ssp. leucothrix (Roughish Witchgrass)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Dichanthelium acuminatum ssp. leucothrix (Roughish Witchgrass)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Dichanthelium acuminatum ssp. spretum (Eaton's Witchgrass)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Dichanthelium ensifolium ssp. curtifolium (Short-leaved Panic Grass)	Eastern Highland Rim Prairie and Barrens			Suit			

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Plant	Dichanthelium ensifolium ssp. curtifolium (Short-leaved Panic Grass)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Dichanthelium ensifolium ssp. ensifolium (Small-leaved Panicgrass)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Dichanthelium ensifolium ssp. ensifolium (Small-leaved Panicgrass)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Dichanthelium ensifolium ssp. ensifolium (Small-leaved Panicgrass)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Plant	Dichanthelium ensifolium ssp. ensifolium (Small-leaved Panicgrass)	Cumberland Seepage Forest				Suit		
Plant	Dichanthelium ensifolium ssp. ensifolium (Small-leaved Panicgrass)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Didiplis diandra (Water-purslane)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Didiplis diandra (Water-purslane)	South-Central Interior Small Stream and Riparian		Suit				Suit
Plant	Didiplis diandra (Water-purslane)	South-Central Interior Large Floodplain						Suit
Plant	Didiplis diandra (Water-purslane)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Didiplis diandra (Water-purslane)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Diervilla lonicera (Northern Bush-honeysuckle)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Diervilla lonicera (Northern Bush-honeysuckle)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Diervilla lonicera (Northern Bush-honeysuckle)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Diervilla lonicera (Northern Bush-honeysuckle)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Plant	Diervilla lonicera (Northern Bush-honeysuckle)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Diervilla lonicera (Northern Bush-honeysuckle)	Southern Appalachian Rocky Summit						Suit
Plant	Diervilla sessilifolia var. rivularis (Mountain Bush-honeysuckle)	South-Central Interior Small Stream and Riparian				Suit	Suit	
Plant	Diervilla sessilifolia var. rivularis (Mountain Bush-honeysuckle)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Plant	Diervilla sessilifolia var. rivularis (Mountain Bush-honeysuckle)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Pref
Plant	Draba cuneifolia (Wedge-leaved Whitlow-grass)	Central Interior Highlands Calcareous Glade and Barrens		Pref	Pref			
Plant	Draba ramosissima (Branching Whitlow-grass)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Draba ramosissima (Branching Whitlow-grass)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Plant	Draba ramosissima (Branching Whitlow-grass)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Draba ramosissima (Branching Whitlow-grass)	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Draba ramosissima (Branching Whitlow-grass)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Drepanolejeunea appalachiana ((a liverwort))	Southern and Central Appalachian Cove Forest				Pref		Pref
Plant	Drepanolejeunea appalachiana ((a liverwort))	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Drosera brevifolia (Dwarf Sundew)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Drosera brevifolia (Dwarf Sundew)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Drosera capillaris (Pink Sundew)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Drosera capillaris (Pink Sundew)	Cumberland Wet-Mesic Meadow and Savanna				Pref		
Plant	Drosera rotundifolia (Roundleaf Sundew)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Drosera rotundifolia (Roundleaf Sundew)	Cumberland Seepage Forest				Suit		

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Plant	Drosera rotundifolia (Roundleaf Sundew)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Drosera rotundifolia (Roundleaf Sundew)	Southern Appalachian Seepage Wetland						Suit
Plant	Drosera rotundifolia (Roundleaf Sundew)	Cumberland Acidic Cliff and Rockhouse				Marg		
Plant	Dryopteris carthusiana (Spinulose Shield Fern)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Dryopteris cristata (Crested Shield-fern)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Plant	Echinacea pallida (Pale-purple Coneflower)	Western Highland Rim Prairie and Barrens			Marg			
Plant	Echinacea pallida (Pale-purple Coneflower)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Echinacea simulata (Wavy-leaf Purple Coneflower)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Echinacea tennesseensis (Tennessee Coneflower)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Echinochloa walteri (Walter's Barnyard Grass)	South-Central Interior Large Floodplain			Pref			
Plant	Echinodorus berteroi (Erect Burhead)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Plant	Echinodorus berteroi (Erect Burhead)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Echinodorus berteroi (Erect Burhead)	Mississippi River Bottomland Depression	Pref					
Plant	Eleocharis compressa (Flat-stemmed Spike-rush)	Central Interior Highlands Calcareous Glade and Barrens			Pref			
Plant	Eleocharis compressa (Flat-stemmed Spike-rush)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Eleocharis equisetoides (Horse-tail Spike-rush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit		
Plant	Eleocharis equisetoides (Horse-tail Spike-rush)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Eleocharis intermedia (Matted Spike-rush)	South-Central Interior Small Stream and Riparian			Suit		Suit	
Plant	Eleocharis intermedia (Matted Spike-rush)	South-Central Interior Large Floodplain			Suit		Suit	
Plant	Eleocharis intermedia (Matted Spike-rush)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Eleocharis intermedia (Matted Spike-rush)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Eleocharis lanceolata (Lance-like Spike-rush)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Plant	Eleocharis lanceolata (Lance-like Spike-rush)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Eleocharis lanceolata (Lance-like Spike-rush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Eleocharis tortilis (Twisted Spike-rush)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Plant	Eleocharis wolfii (Wolf Spike-rush)	Nashville Basin Limestone Glade and Woodland			Marg			
Plant	Eleocharis wolfii (Wolf Spike-rush)	Eastern Highland Rim Prairie and Barrens			Marg			
Plant	Eleocharis wolfii (Wolf Spike-rush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Eleocharis wolfii (Wolf Spike-rush)	South-Central Interior Small Stream and Riparian			Pref			
Plant	Elodea nuttallii (Nuttall's Waterweed)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Plant	Elodea nuttallii (Nuttall's Waterweed)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Elodea nuttallii (Nuttall's Waterweed)	Mississippi River Bottomland Depression	Suit					
Plant	Elodea nuttallii (Nuttall's Waterweed)	South-Central Interior Large Floodplain			Suit		Suit	
Plant	Elodea nuttallii (Nuttall's Waterweed)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Elymus svensonii (Svenson's Wild-rye)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Entodon concinnus (Lime Entodon)	Southern Appalachian Spray Cliff						Suit
Plant	Entodon concinnus (Lime Entodon)	Southern Appalachian Montane Cliff and Talus						Marg
Plant	Epilobium angustifolium (Fireweed)	Southern Appalachian Oak Forest						Marg
Plant	Epilobium angustifolium (Fireweed)	Southern Appalachian Northern Hardwood Forest						Marg
Plant	Epilobium angustifolium (Fireweed)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Plant	Epilobium angustifolium (Fireweed)	Southern Appalachian Grass and Shrub Bald						Marg
Plant	Epilobium angustifolium (Fireweed)	Southern Appalachian Montane Cliff and Talus						Marg
Plant	Epilobium angustifolium (Fireweed)	Southern Appalachian Rocky Summit						Marg
Plant	Epilobium ciliatum (Hairy Willow-herb)	Cumberland Seepage Forest				Marg		
Plant	Epilobium ciliatum (Hairy Willow-herb)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Epilobium ciliatum (Hairy Willow-herb)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Marg	Marg	
Plant	Epilobium ciliatum (Hairy Willow-herb)	Southern Appalachian Seepage Wetland						Pref
Plant	Epilobium leptophyllum (Linear-leaved Willow-herb)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Epilobium leptophyllum (Linear-leaved Willow-herb)	Southern Appalachian Seepage Wetland						Pref
Plant	Eriocaulon decangulare (Ten-angle pipewort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Eriogonum longifolium var. harperi (Harper's Umbrella-plant)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Plant	Eriogonum longifolium var. harperi (Harper's Umbrella-plant)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Eriophorum virginicum (Tawny Cotton-grass)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Eriophorum virginicum (Tawny Cotton-grass)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit		
Plant	Eriophorum virginicum (Tawny Cotton-grass)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Eryngium integrifolium (Blue-flower Coyote-thistle)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Eryngium integrifolium (Blue-flower Coyote-thistle)	South-Central Interior Small Stream and Riparian					Suit	
Plant	Erysimum capitatum (Western Wallflower)	Central Interior Highlands Calcareous Glade and Barrens			Suit		Suit	
Plant	Erysimum capitatum (Western Wallflower)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Erysimum capitatum (Western Wallflower)	Southern Interior Calcareous Cliff					Suit	
Plant	Erythronium rostratum (Beaked Trout-lily)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Plant	Erythronium rostratum (Beaked Trout-lily)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Plant	Erythronium rostratum (Beaked Trout-lily)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Plant	Erythronium rostratum (Beaked Trout-lily)	South-Central Interior Mesophytic Forest		Suit	Pref			
Plant	Eupatorium leucolepis (White-bracted Thoroughwort)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Eupatorium leucolepis (White-bracted Thoroughwort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Eurybia saxicastellii (Rockcastle Aster)	Cumberland Riverscour				Pref		
Plant	Eurybia schreberi (Schreber's Aster)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Eurybia schreberi (Schreber's Aster)	Southern Interior Calcareous Cliff					Pref	
Plant	Evolvulus nuttallianus (Evolvulus)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Festuca paradoxa (Cluster Fescue)	South-Central Interior Mesophytic Forest			Marg			
Plant	Festuca paradoxa (Cluster Fescue)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Festuca paradoxa (Cluster Fescue)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Festuca paradoxa (Cluster Fescue)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Plant	Fimbristylis perpusilla (Harper's Fimbristylis)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Pref		
Plant	Fimbristylis puberula (Hairy Fimbristylis)	Central Interior Highlands Calcareous Glade and Barrens			Pref			
Plant	Fimbristylis puberula (Hairy Fimbristylis)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Fimbristylis puberula (Hairy Fimbristylis)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Fimbristylis puberula (Hairy Fimbristylis)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Fothergilla major (Mountain Witch-alder)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Plant	Fothergilla major (Mountain Witch-alder)	Southern Appalachian Oak Forest						Suit
Plant	Fothergilla major (Mountain Witch-alder)	Cumberland Riverscour				Pref		
Plant	Fothergilla major (Mountain Witch-alder)	South-Central Interior Small Stream and Riparian				Suit		
Plant	Frullania obcordata (Swamp Frullania)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Fuirena squarrosa (Hairy Umbrella-sedge)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Plant	Fuirena squarrosa (Hairy Umbrella-sedge)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Fuirena squarrosa (Hairy Umbrella-sedge)	Interior Low Plateau Seepage Fen			Suit			
Plant	Fuirena squarrosa (Hairy Umbrella-sedge)	South-Central Interior Small Stream and Riparian		Suit	Suit			Suit
Plant	Fuirena squarrosa (Hairy Umbrella-sedge)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Funaria americana ((a moss))	Southern Interior Calcareous Cliff					Pref	
Plant	Galium asprellum (Rough Bedstraw)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Galium asprellum (Rough Bedstraw)	Southern Appalachian Seepage Wetland						Suit
Plant	Galium asprellum (Rough Bedstraw)	South-Central Interior Small Stream and Riparian						Suit
Plant	Galium palustre (Marsh Bedstraw)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Galium palustre (Marsh Bedstraw)	Southern Appalachian Seepage Wetland						Suit
Plant	Galium palustre (Marsh Bedstraw)	South-Central Interior Small Stream and Riparian						Suit
Plant	Galium uniflorum (Fragrant Bedstraw)	South-Central Interior Small Stream and Riparian					Suit	
Plant	Gaylussacia dumosa (Dwarf Huckleberry)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Gaylussacia dumosa (Dwarf Huckleberry)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Gelsemium sempervirens (Yellow Jessamine)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Gelsemium sempervirens (Yellow Jessamine)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Gelsemium sempervirens (Yellow Jessamine)	Southern Appalachian Low-Elevation Pine Forest				Suit	Suit	Suit
Plant	Gelsemium sempervirens (Yellow Jessamine)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Plant	Gelsemium sempervirens (Yellow Jessamine)	Cumberland Sandstone Glade and Barrens				Suit		
Plant	Gelsemium sempervirens (Yellow Jessamine)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Plant	Gentiana austromontana (Appalachian Gentian)	Southern and Central Appalachian Cove Forest						Suit
Plant	Gentiana austromontana (Appalachian Gentian)	Southern Appalachian Oak Forest						Suit
Plant	Gentiana austromontana (Appalachian Gentian)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Gentiana austromontana (Appalachian Gentian)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Plant	Gentiana austromontana (Appalachian Gentian)	Southern Appalachian Grass and Shrub Bald						Marg
Plant	Gentiana linearis (Narrow-leaved Gentian)	Southern Appalachian Seepage Wetland						Suit
Plant	Gentiana puberulenta (Downy Gentian)	Nashville Basin Limestone Glade and Woodland			Marg			
Plant	Gentiana puberulenta (Downy Gentian)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Geranium robertianum (Herb-robert)	South-Central Interior Mesophytic Forest			Suit			
Plant	Geranium robertianum (Herb-robert)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Geum aleppicum (Yellow Avens)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Geum geniculatum (Bent Avens)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Geum geniculatum (Bent Avens)	Southern Appalachian Seepage Wetland						Pref
Plant	Geum laciniatum (Rough Avens)	South-Central Interior Large Floodplain						Pref
Plant	Geum radiatum (Spreading Avens)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Geum radiatum (Spreading Avens)	Southern Appalachian Rocky Summit						Pref
Plant	Glyceria acutiflora (Sharp-scaled Mannagrass)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref		
Plant	Glyceria laxa (Northern Mannagrass)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Glyceria laxa (Northern Mannagrass)	Southern Appalachian Seepage Wetland						Suit
Plant	Glyceria nubigena (Smoky Mountains Mannagrass)	Southern Appalachian Seepage Wetland						Pref
Plant	Goodyera repens (Dwarf Rattlesnake-plantain)	South-Central Interior Mesophytic Forest					Marg	
Plant	Goodyera repens (Dwarf Rattlesnake-plantain)	Southern and Central Appalachian Cove Forest					Suit	Pref
Plant	Gratiola floridana (Florida Hedge-hyssop)	South-Central Interior Small Stream and Riparian			Marg		Marg	
Plant	Gratiola floridana (Florida Hedge-hyssop)	South-Central Interior Large Floodplain			Suit		Suit	
Plant	Grimmia olneyi (Grimmia Moss)	Cumberland Acidic Cliff and Rockhouse					Suit	
Plant	Grimmia olneyi (Grimmia Moss)	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Grimmia olneyi (Grimmia Moss)	Southern Interior Calcareous Cliff					Suit	
Plant	Gymnomitrion laceratum ((a liverwort))	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Gymnomitrion laceratum ((a liverwort))	Southern Appalachian Rocky Summit						Suit
Plant	Gymnopogon brevifolius (Broad-leaved Beardgrass)	Eastern Highland Rim Prairie and Barrens			Pref			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Gymnopogon brevifolius (Broad-leaved Beardgrass)	Cumberland Wet-Mesic Meadow and Savanna				Pref		
Plant	Hasteola suaveolens (Sweet-scented Indian-plantain)	South-Central Interior Small Stream and Riparian			Pref			
Plant	Hedyotis purpurea var. montana (Roan Mountain Bluet)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Hedyotis purpurea var. montana (Roan Mountain Bluet)	Southern Appalachian Rocky Summit						Pref
Plant	Helenium brevifolium (Shortleaf Sneezeweed)	Cumberland Riverscour				Suit		
Plant	Helianthemum propinquum (Low Frostweed)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Helianthemum propinquum (Low Frostweed)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Helianthus eggertii (Eggert's Sunflower)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Plant	Helianthus eggertii (Eggert's Sunflower)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Plant	Helianthus eggertii (Eggert's Sunflower)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit		
Plant	Helianthus eggertii (Eggert's Sunflower)	Western Highland Rim Prairie and Barrens			Pref			
Plant	Helianthus eggertii (Eggert's Sunflower)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Helianthus eggertii (Eggert's Sunflower)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Helianthus eggertii (Eggert's Sunflower)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Helianthus glaucophyllus (White-leaved Sunflower)	Southern Appalachian Oak Forest						Suit
Plant	Helianthus glaucophyllus (White-leaved Sunflower)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Helianthus occidentalis (Naked-stem Sunflower)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit		Suit	
Plant	Helianthus occidentalis (Naked-stem Sunflower)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Helianthus occidentalis (Naked-stem Sunflower)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Helianthus occidentalis (Naked-stem Sunflower)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Plant	Helianthus occidentalis (Naked-stem Sunflower)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Helianthus verticillatus (Whorled Sunflower)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Plant	Helianthus verticillatus (Whorled Sunflower)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Helianthus verticillatus (Whorled Sunflower)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Heracleum maximum (Cow-parsnip)	Southern and Central Appalachian Cove Forest						Suit
Plant	Heracleum maximum (Cow-parsnip)	Southern Appalachian Oak Forest						Suit
Plant	Heracleum maximum (Cow-parsnip)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Heteranthera limosa (Blue Mud-plantain)	South-Central Interior Large Floodplain			Pref			
Plant	Heteranthera limosa (Blue Mud-plantain)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Heuchera longiflora var. aceroides (Maple-leaf Alumroot)	Southern Appalachian Montane Cliff and Talus					Suit	Pref
Plant	Heuchera longiflora var. aceroides (Maple-leaf Alumroot)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Hexastylis virginica (Virginia Heartleaf)	Southern and Central Appalachian Cove Forest					Suit	Suit
Plant	Hieracium longipilum (Hairy Hawkweed)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Plant	Hieracium longipilum (Hairy Hawkweed)	Western Highland Rim Prairie and Barrens			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Hieracium scabrum (Rough Hawkweed)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		Suit
Plant	Hieracium scabrum (Rough Hawkweed)	Southern Appalachian Oak Forest						Suit
Plant	Hieracium scabrum (Rough Hawkweed)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Hieracium scabrum (Rough Hawkweed)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Plant	Homaliadelphus sharpii (Sharp's Homaliadelphus)	Southern Interior Calcareous Cliff					Pref	
Plant	Homaliadelphus sharpii (Sharp's Homaliadelphus)	Southern Interior Sinkhole Wall					Suit	
Plant	Hottonia inflata (Featherfoil)	Mississippi River Bottomland Depression	Pref					
Plant	Hottonia inflata (Featherfoil)	South-Central Interior Large Floodplain			Suit	Suit		
Plant	Huperzia appalachiana (Appalachian Fir Clubmoss)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Huperzia appalachiana (Appalachian Fir Clubmoss)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Huperzia appalachiana (Appalachian Fir Clubmoss)	Southern Appalachian Rocky Summit						Suit
Plant	Hydrastis canadensis (Goldenseal)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Plant	Hydrastis canadensis (Goldenseal)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Plant	Hydrastis canadensis (Goldenseal)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Hydrastis canadensis (Goldenseal)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Hydrastis canadensis (Goldenseal)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Plant	Hydrastis canadensis (Goldenseal)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Plant	Hydrastis canadensis (Goldenseal)	East Gulf Coastal Plain Limestone Forest		Suit				
Plant	Hydrastis canadensis (Goldenseal)	South-Central Interior Mesophytic Forest		Pref	Pref	Pref	Pref	
Plant	Hydrastis canadensis (Goldenseal)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Plant	Hydrastis canadensis (Goldenseal)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Hydrastis canadensis (Goldenseal)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Hydrastis canadensis (Goldenseal)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Plant	Hydrastis canadensis (Goldenseal)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Plant	Hydrocotyle americana (American Water-pennywort)	Southern Appalachian Seepage Wetland						Suit
Plant	Hydrocotyle americana (American Water-pennywort)	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Hydrocotyle americana (American Water-pennywort)	Southern Appalachian Spray Cliff				Suit		Suit
Plant	Hydrolea ovata (Ovate Fiddleleaf)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Hydrophyllum virginianum (Appalachian Waterleaf)	South-Central Interior Mesophytic Forest					Marg	
Plant	Hydrophyllum virginianum (Appalachian Waterleaf)	Southern and Central Appalachian Cove Forest					Marg	Suit
Plant	Hydrophyllum virginianum (Appalachian Waterleaf)	Southern Appalachian Oak Forest						Marg
Plant	Hydrophyllum virginianum (Appalachian Waterleaf)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Hymenophyllum tayloriae (Taylor's Filmy Fern)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Hymenophyllum tayloriae (Taylor's Filmy Fern)	Southern Appalachian Spray Cliff						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Hymenophyllum tayloriae (Taylor's Filmy Fern)	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Hypericum adpressum (Creeping St. John's-wort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit		
Plant	Hypericum adpressum (Creeping St. John's-wort)	South-Central Interior Small Stream and Riparian			Suit	Suit		
Plant	Hypericum adpressum (Creeping St. John's-wort)	South-Central Interior Large Floodplain			Suit	Suit		
Plant	Hypericum adpressum (Creeping St. John's-wort)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Hypericum adpressum (Creeping St. John's-wort)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Hypericum adpressum (Creeping St. John's-wort)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Hypericum ellipticum (Pale St. John's-wort)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Hypericum graveolens (Mountain St. John's-wort)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Hypericum graveolens (Mountain St. John's-wort)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Hypericum graveolens (Mountain St. John's-wort)	Southern Appalachian Seepage Wetland						Suit
Plant	Hypericum mitchellianum (Blue Ridge St. John's-wort)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Iris brevicaulis (Lamance Iris)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Plant	Iris brevicaulis (Lamance Iris)	South-Central Interior Large Floodplain			Marg			
Plant	Iris fulva (Copper Iris)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Iris fulva (Copper Iris)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Iris fulva (Copper Iris)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Iris fulva (Copper Iris)	Mississippi River Bottomland Depression	Suit					
Plant	Iris prismatica (Slender Blue Flag)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Isoetes melanopoda (Blackfoot Quillwort)	South-Central Interior Small Stream and Riparian		Pref	Pref			
Plant	Isoetes tennesseensis (Hiwassee Quillwort)	South-Central Interior Small Stream and Riparian					Pref	Pref
Plant	Isoetes tennesseensis (Hiwassee Quillwort)	South-Central Interior Large Floodplain					Suit	Suit
Plant	Isotria medeoloides (Small Whorled Pogonia)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		Suit
Plant	Isotria medeoloides (Small Whorled Pogonia)	South-Central Interior Mesophytic Forest				Suit		
Plant	Isotria medeoloides (Small Whorled Pogonia)	Southern and Central Appalachian Cove Forest				Suit		
Plant	Isotria medeoloides (Small Whorled Pogonia)	Southern Appalachian Oak Forest						Suit
Plant	Isotria medeoloides (Small Whorled Pogonia)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Isotria medeoloides (Small Whorled Pogonia)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit		Suit
Plant	Juglans cinerea (Butternut)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Plant	Juglans cinerea (Butternut)	South-Central Interior Mesophytic Forest		Marg	Pref	Pref	Pref	
Plant	Juglans cinerea (Butternut)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Plant	Juglans cinerea (Butternut)	South-Central Interior Small Stream and Riparian		Marg	Suit	Suit	Suit	Suit
Plant	Juncus brachycephalus (Small-headed Rush)	Interior Low Plateau Seepage Fen			Pref			
Plant	Juncus brachycephalus (Small-headed Rush)	South-Central Interior Small Stream and Riparian			Suit		Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Juncus trifidus (Highland Rush)	Southern Appalachian Rocky Summit						Pref
Plant	Jungermannia fossombronioides ((a liverwort))	Cumberland Riverscour				Marg		
Plant	Jungermannia fossombronioides ((a liverwort))	South-Central Interior Small Stream and Riparian				Pref		Pref
Plant	Jungermannia fossombronioides ((a liverwort))	Southern Appalachian Spray Cliff				Suit		Suit
Plant	Jungermannia pyriflora ((a liverwort))	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Jungermannia pyriflora ((a liverwort))	South-Central Interior Small Stream and Riparian						Suit
Plant	Krigia montana (False Dandelion)	Southern Appalachian Rocky Summit						Pref
Plant	Lachnanthes caroliana (Carolina Redroot)	Eastern Highland Rim Prairie and Barrens			Marg			
Plant	Lachnanthes caroliana (Carolina Redroot)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Lachnocaulon anceps (Bog-buttons)	Cumberland Wet-Mesic Meadow and Savanna				Marg		
Plant	Lachnocaulon anceps (Bog-buttons)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Pref		
Plant	Lathyrus palustris (Marsh Pea)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Lathyrus palustris (Marsh Pea)	South-Central Interior Small Stream and Riparian			Pref	Pref	Pref	
Plant	Leavenworthia exigua var. exigua (Glade-cress)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit	Suit	Suit	
Plant	Leavenworthia exigua var. exigua (Glade-cress)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Leavenworthia exigua var. exigua (Glade-cress)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Leavenworthia exigua var. lutea (Pasture Glade-cress)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Lechea pulchella (Leggett's Pinweed)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Lejeunea blomquistii (Blomquist Leafy Liverwort)	South-Central Interior Small Stream and Riparian				Suit		Pref
Plant	Lejeunea blomquistii (Blomquist Leafy Liverwort)	Southern Appalachian Spray Cliff				Suit		Suit
Plant	Lejeunea blomquistii (Blomquist Leafy Liverwort)	Southern Appalachian Montane Cliff and Talus				Suit		Suit
Plant	Lejeunea sharpii (Sharp's Lejeunea)	South-Central Interior Small Stream and Riparian			Suit	Suit	Suit	Suit
Plant	Lejeunea sharpii (Sharp's Lejeunea)	Central Interior Calcareous Cliff and Talus			Marg			
Plant	Lejeunea sharpii (Sharp's Lejeunea)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Lejeunea sharpii (Sharp's Lejeunea)	Southern Interior Sinkhole Wall			Pref	Suit	Suit	Suit
Plant	Leptodontium viticulosoides var. sulphureum (Grandfather Mountain Leptodontium)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Leptohymenium sharpii (Mount Leconte Moss)	Southern Appalachian Seepage Wetland						Pref
Plant	Leptohymenium sharpii (Mount Leconte Moss)	South-Central Interior Small Stream and Riparian						Marg
Plant	Leptohymenium sharpii (Mount Leconte Moss)	Southern Appalachian Spray Cliff						Suit
Plant	Leptoscyphus cuneifolius ((a liverwort))	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Lespedeza angustifolia (Narrowleaf Bushclover)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Leucothoe racemosa (Fetter-bush)	Cumberland Riverscour				Pref		
Plant	Leucothoe racemosa (Fetter-bush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Leucothoe racemosa (Fetter-bush)	South-Central Interior Large Floodplain					Marg	
Plant	Liatris cylindracea (Slender Blazing-star)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit	Suit	
Plant	Liatris cylindracea (Slender Blazing-star)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Liatris cylindracea (Slender Blazing-star)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Liatris cylindracea (Slender Blazing-star)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Liatris cylindracea (Slender Blazing-star)	Southern Ridge and Valley Patch Prairie					Marg	
Plant	Liatris pilosa (Shaggy Blazing Star)	Cumberland Riverscour				Pref		
Plant	Lilium canadense (Canada Lily)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Plant	Lilium canadense (Canada Lily)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Plant	Lilium canadense (Canada Lily)	Southern Appalachian Oak Forest					Marg	Marg
Plant	Lilium canadense (Canada Lily)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Lilium canadense (Canada Lily)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref
Plant	Lilium canadense (Canada Lily)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Lilium grayi (Gray's Lily)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Lilium grayi (Gray's Lily)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Lilium grayi (Gray's Lily)	Southern Appalachian Seepage Wetland						Suit
Plant	Lilium michiganense (Michigan Lily)	South-Central Interior Mesophytic Forest		Suit	Pref	Suit	Suit	
Plant	Lilium michiganense (Michigan Lily)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Plant	Lilium michiganense (Michigan Lily)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Lilium michiganense (Michigan Lily)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Lilium michiganense (Michigan Lily)	Cumberland Seepage Forest				Suit		
Plant	Lilium michiganense (Michigan Lily)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Lilium michiganense (Michigan Lily)	Interior Low Plateau Seepage Fen			Suit			
Plant	Lilium michiganense (Michigan Lily)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	
Plant	Lilium philadelphicum (Wood Lily)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Lilium philadelphicum (Wood Lily)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Plant	Lilium philadelphicum (Wood Lily)	Southern Appalachian Oak Forest					Suit	
Plant	Lilium philadelphicum (Wood Lily)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Linnaea borealis (Twinflower)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Linnaea borealis (Twinflower)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Liparis loeselii (Fen Orchid)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Plant	Liparis loeselii (Fen Orchid)	Interior Low Plateau Seepage Fen			Pref			
Plant	Liparis loeselii (Fen Orchid)	South-Central Interior Small Stream and Riparian			Suit	Suit	Suit	Suit
Plant	Liparis loeselii (Fen Orchid)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Liparis loeselii (Fen Orchid)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Liparis loeselii (Fen Orchid)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Listera australis (Southern Twayblade)	Eastern Highland Rim Prairie and Barrens			Marg			
Plant	Listera australis (Southern Twayblade)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Listera australis (Southern Twayblade)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Listera australis (Southern Twayblade)	Cumberland Seepage Forest				Suit		
Plant	Listera australis (Southern Twayblade)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Lobelia amoena (Southern Lobelia)	Southern Appalachian Seepage Wetland						Pref
Plant	Lobelia amoena (Southern Lobelia)	South-Central Interior Small Stream and Riparian						Suit
Plant	Lobelia canbyi (Canby's Lobelia)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Lobelia canbyi (Canby's Lobelia)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Lobelia canbyi (Canby's Lobelia)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit		
Plant	Lonicera canadensis (American Fly-honeysuckle)	Southern and Central Appalachian Cove Forest						Suit
Plant	Lonicera canadensis (American Fly-honeysuckle)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Lonicera canadensis (American Fly-honeysuckle)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Lonicera canadensis (American Fly-honeysuckle)	Appalachian (Hemlock)-Northern Hardwood Forest						Suit
Plant	Lonicera canadensis (American Fly-honeysuckle)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Lonicera canadensis (American Fly-honeysuckle)	Southern Appalachian Seepage Wetland						Suit
Plant	Lonicera canadensis (American Fly-honeysuckle)	South-Central Interior Small Stream and Riparian						Suit
Plant	Lonicera dioica (Mountain Honeysuckle)	Southern and Central Appalachian Cove Forest					Suit	Suit
Plant	Lonicera dioica (Mountain Honeysuckle)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Lonicera dioica (Mountain Honeysuckle)	Southern Appalachian Seepage Wetland						Suit
Plant	Lonicera dioica (Mountain Honeysuckle)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Lonicera dioica (Mountain Honeysuckle)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Lonicera flava (Yellow Honeysuckle)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg		
Plant	Lonicera flava (Yellow Honeysuckle)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Lonicera prolifera (Grape Honeysuckle)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Lonicera prolifera (Grape Honeysuckle)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Lophocolea appalachiana ((a liverwort))	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Lophocolea appalachiana ((a liverwort))	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Lophocolea appalachiana ((a liverwort))	Southern Appalachian Spray Cliff						Suit
Plant	Lophocolea muricata ((a liverwort))	Southern and Central Appalachian Cove Forest						Suit
Plant	Ludwigia sphaerocarpa (Globe-fruited False-loosestrife)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Lycopodiella alopecuroides (Foxtail Clubmoss)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Lycopodiella alopecuroides (Foxtail Clubmoss)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Lycopodium dendroideum (Treelike Clubmoss)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Lycopodium dendroideum (Treelike Clubmoss)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Lycopodium dendroideum (Treelike Clubmoss)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Lysimachia fraseri (Fraser's Loosestrife)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Plant	Lysimachia fraseri (Fraser's Loosestrife)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Lysimachia fraseri (Fraser's Loosestrife)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Lysimachia fraseri (Fraser's Loosestrife)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Plant	Lysimachia fraseri (Fraser's Loosestrife)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Plant	Lysimachia fraseri (Fraser's Loosestrife)	Southern Appalachian Oak Forest					Suit	Suit
Plant	Lysimachia fraseri (Fraser's Loosestrife)	Southern Appalachian Low-Elevation Pine Forest						Suit
Plant	Lysimachia fraseri (Fraser's Loosestrife)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Plant	Lysimachia quadriflora (Four-flowered Loosestrife)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Lysimachia quadriflora (Four-flowered Loosestrife)	South-Central Interior Small Stream and Riparian					Suit	
Plant	Lysimachia terrestris (Swamp Loosestrife)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Lysimachia terrestris (Swamp Loosestrife)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Lysimachia terrestris (Swamp Loosestrife)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Lysimachia terrestris (Swamp Loosestrife)	South-Central Interior Large Floodplain						Marg
Plant	Lysimachia x producta (Loosestrife)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Lysimachia x producta (Loosestrife)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Magnolia virginiana (Sweetbay Magnolia)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Magnolia virginiana (Sweetbay Magnolia)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Magnolia virginiana (Sweetbay Magnolia)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Plant	Magnolia virginiana (Sweetbay Magnolia)	South-Central Interior Small Stream and Riparian		Suit				Suit
Plant	Magnolia virginiana (Sweetbay Magnolia)	South-Central Interior Large Floodplain						Suit
Plant	Maianthemum stellatum (Starflower False Solomon's-seal)	South-Central Interior Small Stream and Riparian			Pref		Pref	
Plant	Marshallia grandiflora (Large-flowered Barbara’s-Buttons)	Cumberland Riverscour				Pref		
Plant	Marshallia obovata (Piedmont Barbara’s-buttons)	Southern Appalachian Low-Elevation Pine Forest						Marg
Plant	Marshallia obovata (Piedmont Barbara’s-buttons)	South-Central Interior Small Stream and Riparian						Marg
Plant	Marshallia trinervia (Broad-leaved Barbara’s-buttons)	Interior Low Plateau Seepage Fen			Suit			
Plant	Marshallia trinervia (Broad-leaved Barbara’s-buttons)	South-Central Interior Small Stream and Riparian			Pref			
Plant	Marsupella funckii ((a liverwort))	Central and Southern Appalachian Spruce-Fir Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Marsupella funckii ((a liverwort))	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Marsupella funckii ((a liverwort))	Southern Appalachian Rocky Summit						Pref
Plant	Meehania cordata (Heartleaf Meehania)	South-Central Interior Mesophytic Forest					Suit	
Plant	Meehania cordata (Heartleaf Meehania)	Southern and Central Appalachian Cove Forest					Suit	Suit
Plant	Meehania cordata (Heartleaf Meehania)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Megaceros aenigmaticus (Megaceros)	South-Central Interior Small Stream and Riparian						Pref
Plant	Melanthium latifolium (Broadleaf Bunchflower)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Melanthium latifolium (Broadleaf Bunchflower)	Allegheny-Cumberland Dry Oak Forest and Woodland						Suit
Plant	Melanthium latifolium (Broadleaf Bunchflower)	South-Central Interior Mesophytic Forest			Suit			
Plant	Melanthium latifolium (Broadleaf Bunchflower)	Southern and Central Appalachian Cove Forest						Suit
Plant	Melanthium latifolium (Broadleaf Bunchflower)	Southern Appalachian Oak Forest						Suit
Plant	Melanthium virginicum (Virginia Bunchflower)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Plant	Melanthium virginicum (Virginia Bunchflower)	South-Central Interior Mesophytic Forest		Suit	Suit			
Plant	Melanthium virginicum (Virginia Bunchflower)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Plant	Melanthium woodii (Ozark Bunchflower)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Melanthium woodii (Ozark Bunchflower)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Plant	Melanthium woodii (Ozark Bunchflower)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Plant	Melanthium woodii (Ozark Bunchflower)	Southern and Central Appalachian Cove Forest				Suit	Suit	
Plant	Melanthium woodii (Ozark Bunchflower)	Southern Appalachian Oak Forest					Suit	
Plant	Menziesia pilosa (Minniebush)	Southern Appalachian Northern Hardwood Forest						Marg
Plant	Menziesia pilosa (Minniebush)	Central and Southern Appalachian Spruce-Fir Forest						Marg
Plant	Menziesia pilosa (Minniebush)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Metzgeria uncigera (Metzgeria)	South-Central Interior Mesophytic Forest				Suit		
Plant	Metzgeria uncigera (Metzgeria)	Southern and Central Appalachian Cove Forest				Suit		
Plant	Metzgeria uncigera (Metzgeria)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Microlejeunea globosa (Cardot's Lejeunea)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Mielichhoferia elongata ((a moss))	Southern Appalachian Montane Cliff and Talus						Pref
Plant	Mielichhoferia elongata ((a moss))	Southern Appalachian Rocky Summit						Suit
Plant	Milium effusum var. cisatlanticum (Tall Millet-grass)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Milium effusum var. cisatlanticum (Tall Millet-grass)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Minuartia cumberlandensis (Cumberland Sandwort)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Minuartia godfreyi (Godfrey's Stitchwort)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Minuartia godfreyi (Godfrey's Stitchwort)	Interior Low Plateau Seepage Fen			Suit			
Plant	Minuartia godfreyi (Godfrey's Stitchwort)	South-Central Interior Small Stream and Riparian			Marg			Marg
Plant	Minuartia groenlandica (Mountain Sandwort)	Southern Appalachian Grass and Shrub Bald						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Minuartia groenlandica (Mountain Sandwort)	Southern Appalachian Rocky Summit						Pref
Plant	Mirabilis albida (Pale Umbrella-wort)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Mnium carolinianum (Carolina Mnium)	Southern and Central Appalachian Cove Forest						Suit
Plant	Mnium carolinianum (Carolina Mnium)	South-Central Interior Small Stream and Riparian						Suit
Plant	Mnium carolinianum (Carolina Mnium)	Southern Appalachian Montane Cliff and Talus						Marg
Plant	Monotropsis odorata (Sweet Pinesap)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Plant	Monotropsis odorata (Sweet Pinesap)	Southern Appalachian Low-Elevation Pine Forest					Pref	Pref
Plant	Monotropsis odorata (Sweet Pinesap)	Southern Appalachian Montane Pine Forest and Woodland					Pref	Pref
Plant	Monotropsis odorata (Sweet Pinesap)	Cumberland Sandstone Glade and Barrens				Suit		
Plant	Muhlenbergia cuspidata (Plains Muhly)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Muhlenbergia glabrifloris (Hair Grass)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Muhlenbergia glabrifloris (Hair Grass)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Plant	Muhlenbergia glabrifloris (Hair Grass)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Muhlenbergia torreyana (Torrey's Dropseed)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Myriophyllum pinnatum (Cutleaf Water-milfoil)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit		
Plant	Myriophyllum pinnatum (Cutleaf Water-milfoil)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Myurella julacea ((a moss))	Southern Interior Calcareous Cliff					Pref	
Plant	Nemopanthus collinus (Long-stalked Holly)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Nemopanthus collinus (Long-stalked Holly)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Nemopanthus collinus (Long-stalked Holly)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Nemopanthus collinus (Long-stalked Holly)	Southern Appalachian Seepage Wetland						Suit
Plant	Neobeckia aquatica (Lake Cress)	Mississippi River Bottomland Depression	Pref					
Plant	Neobeckia aquatica (Lake Cress)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Neobeckia aquatica (Lake Cress)	South-Central Interior Large Floodplain			Suit			
Plant	Nestronia umbellula (Nestronia)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Nestronia umbellula (Nestronia)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Plant	Neviusia alabamensis (Alabama Snow-wreath)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Neviusia alabamensis (Alabama Snow-wreath)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Neviusia alabamensis (Alabama Snow-wreath)	South-Central Interior Mesophytic Forest			Suit	Suit		
Plant	Oenothera macrocarpa (Missouri Primrose)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Oenothera parviflora (Northern Evening-primrose)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Onosmodium hispidissimum (Shaggy False Gromwell)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Onosmodium molle ssp. occidentale (Western False Gromwell)	Central Interior Highlands Calcareous Glade and Barrens			Pref		Pref	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Onosmodium molle ssp. occidentale (Western False Gromwell)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Plant	Onosmodium molle ssp. subsetosum (Smooth False Gromwell)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Onosmodium molle ssp. subsetosum (Smooth False Gromwell)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Ophioglossum crotalophoroides (Bulbous Adder's-tongue)	Urban / Suburban Managed Grassland	Pref	Pref	Pref	Pref	Pref	Pref
Plant	Orobanche ludoviciana (Louisiana Broomrape)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Plant	Orobanche ludoviciana (Louisiana Broomrape)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Orobanche ludoviciana (Louisiana Broomrape)	Mississippi River Riparian Forest	Suit					
Plant	Orobanche ludoviciana (Louisiana Broomrape)	Mississippi River Bottomland Depression	Suit					
Plant	Orthodontium pellucens (Translucent Orthodontium)	Southern Appalachian Montane Cliff and Talus						Pref
Plant	Packera plattensis (Prairie Ragwort)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Packera schweinitziana (Schweinitz's ragwort)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Palamocladium leskeoides (Palamocladium Moss)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Palamocladium leskeoides (Palamocladium Moss)	Southern Interior Calcareous Cliff					Pref	Pref
Plant	Palamocladium leskeoides (Palamocladium Moss)	Southern Interior Sinkhole Wall			Suit	Suit	Suit	Suit
Plant	Panax quinquefolius (American Ginseng)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Plant	Panax quinquefolius (American Ginseng)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Panax quinquefolius (American Ginseng)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Panax quinquefolius (American Ginseng)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Plant	Panax quinquefolius (American Ginseng)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Plant	Panax quinquefolius (American Ginseng)	East Gulf Coastal Plain Limestone Forest		Suit				
Plant	Panax quinquefolius (American Ginseng)	South-Central Interior Mesophytic Forest		Suit	Pref	Pref	Pref	
Plant	Panax quinquefolius (American Ginseng)	Southern and Central Appalachian Cove Forest				Pref	Pref	Pref
Plant	Panax quinquefolius (American Ginseng)	Southern Appalachian Oak Forest					Marg	Marg
Plant	Panax quinquefolius (American Ginseng)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Panax quinquefolius (American Ginseng)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Plant	Panicum hemitomon (Maidencane)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Parnassia grandifolia (Large-leaved Grass-of-parnassus)	Interior Low Plateau Seepage Fen			Pref			
Plant	Parnassia grandifolia (Large-leaved Grass-of-parnassus)	South-Central Interior Small Stream and Riparian			Marg			
Plant	Parnassia grandifolia (Large-leaved Grass-of-parnassus)	Southern Interior Calcareous Cliff					Suit	
Plant	Paronychia argyrocoma (Silverling)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Paronychia argyrocoma (Silverling)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Paronychia argyrocoma (Silverling)	Southern Appalachian Rocky Summit						Pref

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Paxistima canbyi (Canby's Mountain-lover)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Plant	Paxistima canbyi (Canby's Mountain-lover)	Allegheny-Cumberland Dry Oak Forest and Woodland					Marg	
Plant	Paxistima canbyi (Canby's Mountain-lover)	Southern Interior Calcareous Cliff					Pref	
Plant	Paysonia densipila (Duck River Bladderpod)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Paysonia densipila (Duck River Bladderpod)	South-Central Interior Small Stream and Riparian			Suit			
Plant	Paysonia densipila (Duck River Bladderpod)	South-Central Interior Large Floodplain			Suit			
Plant	Paysonia densipila (Duck River Bladderpod)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Paysonia densipila (Duck River Bladderpod)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Paysonia perforata (Spring Creek Bladderpod)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Paysonia perforata (Spring Creek Bladderpod)	South-Central Interior Small Stream and Riparian			Suit			
Plant	Paysonia perforata (Spring Creek Bladderpod)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Paysonia perforata (Spring Creek Bladderpod)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Paysonia stonensis (Stones River Bladderpod)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Paysonia stonensis (Stones River Bladderpod)	South-Central Interior Small Stream and Riparian			Marg			
Plant	Paysonia stonensis (Stones River Bladderpod)	South-Central Interior Large Floodplain			Suit			
Plant	Paysonia stonensis (Stones River Bladderpod)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Paysonia stonensis (Stones River Bladderpod)	Cropland	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Pedicularis lanceolata (Swamp Lousewort)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Pedicularis lanceolata (Swamp Lousewort)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Pedicularis lanceolata (Swamp Lousewort)	Southern Ridge and Valley Patch Prairie					Marg	
Plant	Pedicularis lanceolata (Swamp Lousewort)	South-Central Interior Small Stream and Riparian					Suit	Suit
Plant	Pedicularis lanceolata (Swamp Lousewort)	South-Central Interior Large Floodplain			Suit			
Plant	Pellia appalachiana ((a liverwort))	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref
Plant	Pellia appalachiana ((a liverwort))	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Penstemon tubiflorus (Small-flowered Beardtongue)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Plant	Perideridia americana (Thicket Parsley)	Central Interior Highlands Calcareous Glade and Barrens			Pref			
Plant	Perideridia americana (Thicket Parsley)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Phacelia ranunculacea (Blue Scorpion-weed)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Phacelia ranunculacea (Blue Scorpion-weed)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Phacelia ranunculacea (Blue Scorpion-weed)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Phacelia ranunculacea (Blue Scorpion-weed)	Mississippi River Bottomland Depression	Pref					
Plant	Phacelia ranunculacea (Blue Scorpion-weed)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Plant	Phacelia ranunculacea (Blue Scorpion-weed)	South-Central Interior Large Floodplain			Pref			
Plant	Phegopteris connectilis (Northern Beechfern)	Southern Appalachian Northern Hardwood Forest						Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Phegopteris connectilis (Northern Beechfern)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Phegopteris connectilis (Northern Beechfern)	Appalachian (Hemlock)-Northern Hardwood Forest						Marg
Plant	Phegopteris connectilis (Northern Beechfern)	Southern Appalachian Spray Cliff						Pref
Plant	Phegopteris connectilis (Northern Beechfern)	Southern Appalachian Rocky Summit						Suit
Plant	Phemeranthus calcaricus (Limestone Fame-flower)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Phemeranthus mengesii (Menge's Fame-flower)	Cumberland Sandstone Glade and Barrens				Pref		
Plant	Phemeranthus teretifolius (Roundleaf Fameflower)	Cumberland Sandstone Glade and Barrens				Pref		
Plant	Phlox bifida ssp. stellaria (Glade Cleft Phlox)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Phlox pilosa ssp. ozarkana (Ozark Downy Phlox)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Phlox pilosa ssp. ozarkana (Ozark Downy Phlox)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Phlox subulata (Moss Phlox)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Marg	
Plant	Phlox subulata (Moss Phlox)	Southern Interior Calcareous Cliff					Pref	
Plant	Physaria globosa (Short's Bladderpod)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Pieris floribunda (Mountain Fetter-bush)	Southern Appalachian Montane Pine Forest and Woodland					Suit	Suit
Plant	Pieris floribunda (Mountain Fetter-bush)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Pilularia americana (American Pillwort)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Pilularia americana (American Pillwort)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Plant	Pilularia americana (American Pillwort)	Converted Wetland (Lacustrine)	Pref	Pref	Pref	Pref	Pref	Pref
Plant	Pityopsis ruthii (Ruth's Golden-aster)	South-Central Interior Small Stream and Riparian						Pref
Plant	Plagiochila exigua ((a liverwort))	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Plagiochila punctata (Spotty featherwort)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Plantago cordata (Heart-leaved Plantain)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref		
Plant	Platanthera flava var. herbiola (Tubercled Rein-orchid)	Southern Appalachian Seepage Wetland						Marg
Plant	Platanthera flava var. herbiola (Tubercled Rein-orchid)	South-Central Interior Small Stream and Riparian				Pref	Pref	Pref
Plant	Platanthera grandiflora (Large Purple Fringed Orchid)	Southern Appalachian Seepage Wetland						Suit
Plant	Platanthera grandiflora (Large Purple Fringed Orchid)	South-Central Interior Small Stream and Riparian						Suit
Plant	Platanthera integra (Yellow Fringeless Orchid)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Platanthera integra (Yellow Fringeless Orchid)	Cumberland Wet-Mesic Meadow and Savanna				Pref		
Plant	Platanthera integrilabia (White Fringeless Orchid)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Platanthera integrilabia (White Fringeless Orchid)	Cumberland Seepage Forest				Pref		
Plant	Platanthera integrilabia (White Fringeless Orchid)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Platanthera nivea (Snowy Orchid)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Platanthera orbiculata (Large Round-leaved Orchid)	Southern and Central Appalachian Cove Forest				Suit	Suit	Pref
Plant	Platanthera orbiculata (Large Round-leaved Orchid)	Southern Appalachian Oak Forest						Suit
Plant	Platanthera orbiculata (Large Round-leaved Orchid)	Cumberland Seepage Forest				Marg		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Platanthera psycodes (Small Purple Fringed Orchid)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Platanthera psycodes (Small Purple Fringed Orchid)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Platanthera psycodes (Small Purple Fringed Orchid)	Southern Appalachian Seepage Wetland						Suit
Plant	Poa palustris (Fowl Bluegrass)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Poa palustris (Fowl Bluegrass)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Poa palustris (Fowl Bluegrass)	Southern Appalachian Seepage Wetland						Suit
Plant	Poa palustris (Fowl Bluegrass)	South-Central Interior Small Stream and Riparian						Suit
Plant	Poa saltuensis (Drooping Bluegrass)	Southern Appalachian Oak Forest						Suit
Plant	Poa saltuensis (Drooping Bluegrass)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Poa saltuensis (Drooping Bluegrass)	Cumberland Riverscour				Suit		
Plant	Poa saltuensis (Drooping Bluegrass)	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Pogonia ophioglossoides (Rose Pogonia)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Pogonia ophioglossoides (Rose Pogonia)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Pogonia ophioglossoides (Rose Pogonia)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Pogonia ophioglossoides (Rose Pogonia)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit		
Plant	Pogonia ophioglossoides (Rose Pogonia)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Polygala boykinii (Boykin's Milkwort)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Polygala mariana (Maryland Milkwort)	Southern Appalachian Low-Elevation Pine Forest					Suit	
Plant	Polygala mariana (Maryland Milkwort)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Plant	Polygala mariana (Maryland Milkwort)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Polygala mariana (Maryland Milkwort)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Polygala mariana (Maryland Milkwort)	South-Central Interior Small Stream and Riparian		Suit				
Plant	Polygala nana (Dwarf Milkwort)	Cumberland Sandstone Glade and Barrens				Suit		
Plant	Polygala nana (Dwarf Milkwort)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Polygala nuttallii (Nuttall's Milkwort)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Polygonella americana (Southern Jointweed)	Cumberland Riverscour				Pref		
Plant	Polygonum arifolium (Halberd-leaf Tearthumb)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Polygonum arifolium (Halberd-leaf Tearthumb)	South-Central Interior Small Stream and Riparian		Suit				Suit
Plant	Polygonum arifolium (Halberd-leaf Tearthumb)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Polygonum cilinode (Fringed Black Bindweed)	Southern Appalachian Oak Forest						Suit
Plant	Polygonum cilinode (Fringed Black Bindweed)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Polygonum cilinode (Fringed Black Bindweed)	Southern Appalachian Rocky Summit						Suit
Plant	Polytaenia nuttallii (Prairie Parsley)	Central Interior Highlands Calcareous Glade and Barrens			Pref			
Plant	Polytaenia nuttallii (Prairie Parsley)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Ponthieva racemosa (Shadow-witch)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Porella gracillima (Hot Porella)	Southern Interior Calcareous Cliff						Suit
Plant	Porella gracillima (Hot Porella)	Southern Interior Sinkhole Wall						Pref
Plant	Porella wataugensis (Watauga Porella)	Southern Appalachian Spray Cliff						Suit
Plant	Porella wataugensis (Watauga Porella)	Southern Appalachian Montane Cliff and Talus						Pref
Plant	Potamogeton amplifolius (Large-leaf Pondweed)	South-Central Interior Small Stream and Riparian			Pref	Pref	Pref	Pref
Plant	Potamogeton amplifolius (Large-leaf Pondweed)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Potamogeton epihydrus (Nuttall's Pondweed)	South-Central Interior Small Stream and Riparian				Pref	Pref	Pref
Plant	Potamogeton epihydrus (Nuttall's Pondweed)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Potamogeton tennesseensis (Tennessee Pondweed)	South-Central Interior Small Stream and Riparian				Pref		Pref
Plant	Potamogeton tennesseensis (Tennessee Pondweed)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Potentilla tridentata (Three-toothed Cinquefoil)	Southern Appalachian Grass and Shrub Bald						Pref
Plant	Potentilla tridentata (Three-toothed Cinquefoil)	Southern Appalachian Rocky Summit						Suit
Plant	Preissia quadrata (Narrow Mushroom-headed Liverwort)	Southern Interior Calcareous Cliff					Pref	
Plant	Prenanthes aspera (Rough Rattlesnake-root)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Prenanthes aspera (Rough Rattlesnake-root)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Prenanthes aspera (Rough Rattlesnake-root)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Prenanthes barbata (Bearded Rattlesnake-root)	Central Interior Highlands Calcareous Glade and Barrens			Suit			
Plant	Prenanthes barbata (Bearded Rattlesnake-root)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Plant	Prenanthes barbata (Bearded Rattlesnake-root)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Prenanthes crepidinea (Nodding Rattlesnake-root)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Plant	Prenanthes crepidinea (Nodding Rattlesnake-root)	South-Central Interior Mesophytic Forest			Suit			
Plant	Prenanthes crepidinea (Nodding Rattlesnake-root)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Prunus pumila (Sand Cherry)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Prunus pumila (Sand Cherry)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Prunus virginiana (Choke Cherry)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Plant	Prunus virginiana (Choke Cherry)	Southern and Central Appalachian Cove Forest						Suit
Plant	Prunus virginiana (Choke Cherry)	Southern Appalachian Oak Forest						Suit
Plant	Prunus virginiana (Choke Cherry)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Prunus virginiana (Choke Cherry)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Pseudognaphalium helleri (Heller's Catfoot)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Pseudognaphalium helleri (Heller's Catfoot)	Allegheny-Cumberland Dry Oak Forest and Woodland					Suit	
Plant	Pseudognaphalium helleri (Heller's Catfoot)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Pycnanthemum beadlei (Beadle's Mountain Mint)	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Pycnanthemum torrei (Torrey's Mountain-mint)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Pycnanthemum torrei (Torrey's Mountain-mint)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Plant	Pycnanthemum torrei (Torrey's Mountain-mint)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Pyrola americana (American Wintergreen)	Southern Appalachian Oak Forest					Pref	Pref
Plant	Quercus margarettiae (Sand Post Oak)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Plant	Quercus margarettiae (Sand Post Oak)	Central Interior Highlands Dry Acidic Glade and Barrens		Pref				
Plant	Radula voluta ((a liverwort))	Cumberland Riverscour				Suit		
Plant	Radula voluta ((a liverwort))	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Radula voluta ((a liverwort))	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Radula voluta ((a liverwort))	Southern Appalachian Montane Cliff and Talus				Suit		
Plant	Radula voluta ((a liverwort))	Southern Interior Calcareous Cliff						Suit
Plant	Radula voluta ((a liverwort))	Southern Interior Sinkhole Wall			Suit	Suit		Suit
Plant	Ranunculus aquatilis var. diffusus (White Water-buttercup)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Ranunculus aquatilis var. diffusus (White Water-buttercup)	South-Central Interior Large Floodplain			Suit			
Plant	Ranunculus aquatilis var. diffusus (White Water-buttercup)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Ranunculus flabellaris (Yellow Water-crowfoot)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Ranunculus flabellaris (Yellow Water-crowfoot)	Mississippi River Bottomland Depression	Pref					
Plant	Ranunculus flabellaris (Yellow Water-crowfoot)	South-Central Interior Large Floodplain			Suit		Suit	
Plant	Rhachithecium perpusillum (Budding Tortula)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Plant	Rhamnus alnifolia (Alderleaf Buckthorn)	Southern Interior Calcareous Cliff					Pref	
Plant	Rhynchospora alba (White Beakrush)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Rhynchospora caduca (Falling Beaked-rush)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Rhynchospora caduca (Falling Beaked-rush)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Rhynchospora capillacea (Horned Beakrush)	South-Central Interior Small Stream and Riparian					Suit	
Plant	Rhynchospora chalarocephala (Loose-headed Beakrush)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Rhynchospora latifolia (Giant White-top Sedge)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Rhynchospora perplexa (Obscure Beak-rush)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Rhynchospora perplexa (Obscure Beak-rush)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Rhynchospora perplexa (Obscure Beak-rush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit		
Plant	Rhynchospora rariflora (Few-flowered Beak-rush)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Rhynchospora rariflora (Few-flowered Beak-rush)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Rhynchospora rariflora (Few-flowered Beak-rush)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Suit		
Plant	Rhynchospora wrightiana (Wright's Beak-rush)	Cumberland Seepage Forest				Marg		
Plant	Rhynchospora wrightiana (Wright's Beak-rush)	Central Interior Highlands and Appalachian Sinkhole and				Suit		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Depression Pond						
Plant	Ribes curvatum (Granite Gooseberry)	Cumberland Sandstone Glade and Barrens				Pref		
Plant	Ribes odoratum (Buffalo Currant)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Rudbeckia subtomentosa (Sweet Coneflower)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Plant	Ruellia purshiana (Pursh's Wild-petunia)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Plant	Ruellia purshiana (Pursh's Wild-petunia)	Southern Interior Calcareous Cliff					Pref	
Plant	Rugelia nudicaulis (Rugel's Ragwort)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Rugelia nudicaulis (Rugel's Ragwort)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Sabatia capitata (Cumberland Rose Gentian)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Plant	Sabatia capitata (Cumberland Rose Gentian)	Cumberland Sandstone Glade and Barrens				Suit		
Plant	Sabatia capitata (Cumberland Rose Gentian)	Cumberland Riverscour				Marg		
Plant	Sabatia capitata (Cumberland Rose Gentian)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Sacciolepis striata (Gibbous Panic-grass)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Sacciolepis striata (Gibbous Panic-grass)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Plant	Sacciolepis striata (Gibbous Panic-grass)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Plant	Sacciolepis striata (Gibbous Panic-grass)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Sagittaria brevirostra (Short-beaked Arrowhead)	South-Central Interior Large Floodplain			Pref			
Plant	Sagittaria graminea (Grassleaf Arrowhead)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref		
Plant	Sagittaria platyphylla (Ovate-leaved Arrowhead)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Sagittaria platyphylla (Ovate-leaved Arrowhead)	Mississippi River Bottomland Depression	Pref					
Plant	Sagittaria platyphylla (Ovate-leaved Arrowhead)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Plant	Sagittaria platyphylla (Ovate-leaved Arrowhead)	South-Central Interior Large Floodplain			Pref	Pref	Pref	Pref
Plant	Sagittaria platyphylla (Ovate-leaved Arrowhead)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Sagittaria rigida (Sessile-fruited Arrowhead)	South-Central Interior Large Floodplain			Suit			
Plant	Salvia azurea var. grandiflora (Blue Sage)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Pref			
Plant	Salvia azurea var. grandiflora (Blue Sage)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Marg				
Plant	Sanguisorba canadensis (Canada Burnet)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Sanguisorba canadensis (Canada Burnet)	Southern Appalachian Seepage Wetland						Suit
Plant	Sarracenia oreophila (Green Pitcher Plant)	Cumberland Seepage Forest				Marg		
Plant	Sarracenia oreophila (Green Pitcher Plant)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit		
Plant	Saxifraga caroliniana (Carolina Saxifrage)	Southern Appalachian Spray Cliff						Suit
Plant	Saxifraga caroliniana (Carolina Saxifrage)	Southern Appalachian Montane Cliff and Talus						Pref
Plant	Saxifraga pensylvanica (Swamp Saxifrage)	Southern and Central Appalachian Bog and Fen						Pref

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Schisandra glabra (Red Starvine)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Pref				
Plant	Schisandra glabra (Red Starvine)	South-Central Interior Mesophytic Forest					Suit	
Plant	Schoenolirion croceum (Yellow Sunnybell)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Schoenoplectus subterminalis (Water Bulrush)	South-Central Interior Small Stream and Riparian				Suit		
Plant	Schwalbea americana (Chaffseed)	Eastern Highland Rim Prairie and Barrens			Marg			
Plant	Scleria verticillata (Low Nutrush)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Scleria verticillata (Low Nutrush)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Scopelophila cataractae (Agoyan Cataract Moss)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Scutellaria arguta (Hairy Skullcap)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Scutellaria montana (Large-flowered Skullcap)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Scutellaria montana (Large-flowered Skullcap)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Plant	Scutellaria montana (Large-flowered Skullcap)	South-Central Interior Mesophytic Forest				Suit	Suit	
Plant	Scutellaria montana (Large-flowered Skullcap)	Southern Appalachian Low-Elevation Pine Forest				Marg	Marg	
Plant	Scutellaria saxatilis (Rock Skullcap)	South-Central Interior Mesophytic Forest				Marg	Marg	
Plant	Scutellaria saxatilis (Rock Skullcap)	Southern and Central Appalachian Cove Forest				Marg	Marg	Pref
Plant	Scutellaria saxatilis (Rock Skullcap)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Scutellaria saxatilis (Rock Skullcap)	Southern Appalachian Seepage Wetland						Suit
Plant	Sedum nevii (Nevius' Stonecrop)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Sedum nevii (Nevius' Stonecrop)	Southern Interior Calcareous Cliff						Suit
Plant	Silene caroliniana ssp. pensylvanica (Carolina Pink)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest					Suit	
Plant	Silene caroliniana ssp. pensylvanica (Carolina Pink)	Central Interior Highlands Calcareous Glade and Barrens					Marg	
Plant	Silene caroliniana ssp. pensylvanica (Carolina Pink)	Central Appalachian Alkaline Glade and Woodland					Suit	
Plant	Silene caroliniana ssp. pensylvanica (Carolina Pink)	Southern Interior Calcareous Cliff					Suit	
Plant	Silene ovata (Ovate Catchfly)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Plant	Silene ovata (Ovate Catchfly)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Plant	Silene ovata (Ovate Catchfly)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Silene ovata (Ovate Catchfly)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Silene ovata (Ovate Catchfly)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Plant	Silene ovata (Ovate Catchfly)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Plant	Silene ovata (Ovate Catchfly)	East Gulf Coastal Plain Limestone Forest		Suit				
Plant	Silene ovata (Ovate Catchfly)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Silene ovata (Ovate Catchfly)	Southern and Central Appalachian Cove Forest				Suit		Suit
Plant	Silene ovata (Ovate Catchfly)	Southern Appalachian Oak Forest						Suit
Plant	Silene ovata (Ovate Catchfly)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Silene ovata (Ovate Catchfly)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Plant	Silene regia (Royal Catchfly)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Silene regia (Royal Catchfly)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Silene regia (Royal Catchfly)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Silphium brachiatum (Cumberland Rosinweed)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit		
Plant	Silphium brachiatum (Cumberland Rosinweed)	Central Interior Highlands Calcareous Glade and Barrens				Pref		
Plant	Silphium laciniatum (Compass Plant)	Central Interior Highlands Calcareous Glade and Barrens					Suit	
Plant	Silphium laciniatum (Compass Plant)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Silphium laciniatum (Compass Plant)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Plant	Silphium laciniatum (Compass Plant)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Plant	Silphium laciniatum (Compass Plant)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Plant	Silphium laciniatum (Compass Plant)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit	Suit	
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Silphium pinnatifidum (Southern Prairie-dock)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Silphium wasiotense (Kentucky Rosinweed)	Southern Appalachian Oak Forest					Suit	
Plant	Smilax laurifolia (Laurel-leaf Greenbrier)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Plant	Smilax laurifolia (Laurel-leaf Greenbrier)	South-Central Interior Small Stream and Riparian					Suit	
Plant	Solidago arenicola (Southern racemose goldenrod)	Cumberland Riverscour				Pref		
Plant	Solidago auriculata (Eared Goldenrod)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref		
Plant	Solidago auriculata (Eared Goldenrod)	Central Interior Highlands Calcareous Glade and Barrens				Suit		
Plant	Solidago gattingeri (Gattinger's Goldenrod)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Solidago lancifolia (Broadleaf Goldenrod)	Southern Appalachian Oak Forest						Suit
Plant	Solidago lancifolia (Broadleaf Goldenrod)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Solidago ptarmicoides (Prairie Goldenrod)	Central Interior Highlands Calcareous Glade and Barrens				Suit	Suit	
Plant	Solidago ptarmicoides (Prairie Goldenrod)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Suit	
Plant	Solidago ptarmicoides (Prairie Goldenrod)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Solidago rupestris (Rock Goldenrod)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Solidago spithamaea (Blue Ridge Goldenrod)	Southern Appalachian Rocky Summit						Pref
Plant	Solidago stricta var. gracillima (Virginia Goldenrod)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Solidago tarda (Late Goldenrod)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Plant	Solidago tarda (Late Goldenrod)	Cumberland Sandstone Glade and Barrens				Pref		
Plant	Sparganium androcladum (Branching Bur-reed)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Plant	Sparganium androcladum (Branching Bur-reed)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit		Suit	
Plant	Sphenolobopsis pearsoni (Sphenolobopsis)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Spiraea alba (Narrow-leaved Meadow-sweet)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Spiraea virginiana (Virginia Spiraea)	Cumberland Riverscour				Pref		
Plant	Spiraea virginiana (Virginia Spiraea)	South-Central Interior Small Stream and Riparian				Pref		Pref
Plant	Spiranthes lucida (Shining Ladies'-tresses)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Plant	Spiranthes lucida (Shining Ladies'-tresses)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Plant	Spiranthes lucida (Shining Ladies'-tresses)	Interior Low Plateau Seepage Fen			Pref			
Plant	Spiranthes lucida (Shining Ladies'-tresses)	Southern Appalachian Seepage Wetland						Suit
Plant	Spiranthes lucida (Shining Ladies'-tresses)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Plant	Spiranthes lucida (Shining Ladies'-tresses)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Plant	Spiranthes magnicamporum (Great Plains Ladies'-tresses)	Central Interior Highlands Calcareous Glade and Barrens			Suit	Suit	Suit	
Plant	Spiranthes magnicamporum (Great Plains Ladies'-tresses)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Plant	Spiranthes ochroleuca (Yellow Nodding Ladies'-tresses)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Spiranthes odorata (Sweetscent Ladies'-tresses)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit		Suit	
Plant	Spiranthes odorata (Sweetscent Ladies'-tresses)	South-Central Interior Large Floodplain			Marg		Marg	
Plant	Spiranthes odorata (Sweetscent Ladies'-tresses)	Converted Wetland (Lacustrine)			Marg		Marg	
Plant	Spiranthes odorata (Sweetscent Ladies'-tresses)	Converted Wetland (Riverine)			Marg		Marg	
Plant	Spiranthes odorata (Sweetscent Ladies'-tresses)	Converted Wetland (Palustrine)			Marg		Marg	
Plant	Sporobolus heterolepis (Northern Dropseed)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Sporobolus junceus (Pinelands Dropseed)	Cumberland Riverscour				Suit		
Plant	Stachys clingmanii (Clingman's Hedge-nettle)	Southern and Central Appalachian Cove Forest						Pref
Plant	Stachys clingmanii (Clingman's Hedge-nettle)	Southern Appalachian Oak Forest						Suit
Plant	Stachys clingmanii (Clingman's Hedge-nettle)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Stellaria alsine (Trailing Stitchwort)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Stellaria alsine (Trailing Stitchwort)	Southern Appalachian Seepage Wetland						Suit
Plant	Stellaria alsine (Trailing Stitchwort)	Converted Wetland (Palustrine)						Marg
Plant	Stellaria fontinalis (Water Stitchwort)	South-Central Interior Small Stream and Riparian			Pref			
Plant	Stellaria fontinalis (Water Stitchwort)	South-Central Interior Large Floodplain			Suit			
Plant	Stellaria fontinalis (Water Stitchwort)	Central Interior Calcareous Cliff and Talus			Marg			
Plant	Stellaria longifolia (Longleaf Stitchwort)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Stellaria longifolia (Longleaf Stitchwort)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Stellaria longifolia (Longleaf Stitchwort)	Southern Appalachian Seepage Wetland						Marg
Plant	Streptopus amplexifolius (White Mandarin)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Streptopus amplexifolius (White Mandarin)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Plant	Streptopus roseus (Rosy Twisted-stalk)	Southern and Central Appalachian Cove Forest						Suit
Plant	Streptopus roseus (Rosy Twisted-stalk)	Southern Appalachian Oak Forest						Suit
Plant	Streptopus roseus (Rosy Twisted-stalk)	Southern Appalachian Northern Hardwood Forest						Pref
Plant	Streptopus roseus (Rosy Twisted-stalk)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Plant	Streptopus roseus (Rosy Twisted-stalk)	Southern Appalachian Grass and Shrub Bald						Suit
Plant	Streptopus roseus (Rosy Twisted-stalk)	Southern Appalachian Rocky Summit						Suit
Plant	Stylisma humistrata (Southern Morning-glory)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Sullivantia sullivantii (Sullivantia)	Southern Interior Calcareous Cliff					Pref	
Plant	Symphyotrichum praealtum (Willow Aster)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Plant	Symphyotrichum praealtum (Willow Aster)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Symphyotrichum praealtum (Willow Aster)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Symphyotrichum praealtum (Willow Aster)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Symphyotrichum praealtum (Willow Aster)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Symphyotrichum praealtum (Willow Aster)	South-Central Interior Small Stream and Riparian		Suit	Suit			Suit
Plant	Symphyotrichum praealtum (Willow Aster)	South-Central Interior Large Floodplain			Suit			Suit
Plant	Symphyotrichum praealtum (Willow Aster)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Symphyotrichum praealtum (Willow Aster)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Symphyotrichum praealtum (Willow Aster)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Symphyotrichum pratense (Barrens Silky Aster)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg		
Plant	Symphyotrichum pratense (Barrens Silky Aster)	Central Interior Highlands Calcareous Glade and Barrens			Pref			
Plant	Symphyotrichum pratense (Barrens Silky Aster)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Symphyotrichum pratense (Barrens Silky Aster)	Southern Ridge and Valley Patch Prairie					Suit	
Plant	Symphyotrichum pratense (Barrens Silky Aster)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Symplocarpus foetidus (Skunk-cabbage)	Southern and Central Appalachian Bog and Fen					Pref	Pref
Plant	Symplocarpus foetidus (Skunk-cabbage)	Southern Appalachian Seepage Wetland						Suit
Plant	Symplocarpus foetidus (Skunk-cabbage)	South-Central Interior Small Stream and Riparian					Suit	Suit
Plant	Symplocos tinctoria (Horse-sugar)	Southern Appalachian Oak Forest						Suit
Plant	Symplocos tinctoria (Horse-sugar)	Southern Appalachian Low-Elevation Pine Forest						Suit
Plant	Symplocos tinctoria (Horse-sugar)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Symplocos tinctoria (Horse-sugar)	South-Central Interior Small Stream and Riparian						Marg
Plant	Taxus canadensis (American Yew)	South-Central Interior Mesophytic Forest				Suit		
Plant	Tetrodontium brownianum (Little Georgia)	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Tetrodontium brownianum (Little Georgia)	Southern Appalachian Spray Cliff						Suit
Plant	Thalictrum coriaceum (Leatherleaf Meadowrue)	South-Central Interior Mesophytic Forest				Suit	Suit	
Plant	Thalictrum coriaceum (Leatherleaf Meadowrue)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Plant	Thalictrum coriaceum (Leatherleaf Meadowrue)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Thalictrum coriaceum (Leatherleaf Meadowrue)	Cumberland Riverscour				Suit		
Plant	Thalictrum coriaceum (Leatherleaf Meadowrue)	South-Central Interior Small Stream and Riparian				Suit	Suit	Suit
Plant	Thaspium pinnatifidum (Cutleaf Meadow-parsnip)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Plant	Thaspium pinnatifidum (Cutleaf Meadow-parsnip)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Thelypteris simulata (Bog Fern)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Thelypteris simulata (Bog Fern)	Southern Appalachian Seepage Wetland						Suit
Plant	Thermopsis fraxinifolia (Ash-leaved Bush-pea)	Southern and Central Appalachian Cove Forest					Suit	Suit
Plant	Thermopsis fraxinifolia (Ash-leaved Bush-pea)	Southern Appalachian Oak Forest						Suit
Plant	Thermopsis mollis (Allegheny Mountain golden banner)	Allegheny-Cumberland Dry Oak Forest and Woodland				Pref		
Plant	Thuja occidentalis (Northern White Cedar)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Thuja occidentalis (Northern White Cedar)	Cumberland Acidic Cliff and Rockhouse				Marg		
Plant	Thuja occidentalis (Northern White Cedar)	Southern Interior Calcareous Cliff					Suit	Suit
Plant	Torreyochloa pallida (Pale Manna Grass)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Tortula ammonsiana (Ammons's Tortula)	Southern Appalachian Spray Cliff						Suit
Plant	Tortula ammonsiana (Ammons's Tortula)	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Tortula fragilis (Fragile Tortula)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Tortula fragilis (Fragile Tortula)	Southern Interior Sinkhole Wall			Suit			
Plant	Triadenum fraseri (Marsh St. John's-wort)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Triantha racemosa (Coastal False-asphodel)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Triantha racemosa (Coastal False-asphodel)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Plant	Trichomanes boschianum (Bristle-fern)	South-Central Interior Mesophytic Forest			Marg			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Trichomanes boschianum (Bristle-fern)	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Trichomanes boschianum (Bristle-fern)	Central Interior Acidic Cliff and Talus			Suit			
Plant	Trichomanes boschianum (Bristle-fern)	Cumberland Acidic Cliff and Rockhouse				Pref		
Plant	Trichomanes boschianum (Bristle-fern)	Southern Appalachian Montane Cliff and Talus						Suit
Plant	Trichomanes petersii (Dwarf Filmy-fern)	South-Central Interior Small Stream and Riparian				Suit		Suit
Plant	Trichomanes petersii (Dwarf Filmy-fern)	Cumberland Acidic Cliff and Rockhouse				Suit		
Plant	Trichomanes petersii (Dwarf Filmy-fern)	Southern Appalachian Montane Cliff and Talus						Pref
Plant	Trichophorum cespitosum (Tufted Club-rush)	Southern Appalachian Grass and Shrub Bald						Marg
Plant	Trichophorum cespitosum (Tufted Club-rush)	Southern Appalachian Montane Cliff and Talus						Marg
Plant	Trichophorum cespitosum (Tufted Club-rush)	Southern Appalachian Rocky Summit						Pref
Plant	Tridens flavus var. chapmanii (Chapman's Redtop)	South-Central Interior / Upper Coastal Plain Flatwoods		Pref				
Plant	Trientalis borealis (Northern Starflower)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Plant	Trientalis borealis (Northern Starflower)	Southern Appalachian Northern Hardwood Forest						Suit
Plant	Trifolium calcaricum (Running Glade Clover)	Nashville Basin Limestone Glade and Woodland			Pref			
Plant	Trifolium reflexum (Buffalo Clover)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Plant	Trifolium reflexum (Buffalo Clover)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Trifolium reflexum (Buffalo Clover)	Allegheny-Cumberland Dry Oak Forest and Woodland						Suit
Plant	Trifolium reflexum (Buffalo Clover)	Southern Appalachian Montane Pine Forest and Woodland						Suit
Plant	Trifolium reflexum (Buffalo Clover)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Plant	Trifolium reflexum (Buffalo Clover)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit			
Plant	Trifolium reflexum (Buffalo Clover)	Southern and Central Appalachian Mafic Glade and Barrens						Suit
Plant	Trifolium reflexum (Buffalo Clover)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Plant	Trifolium reflexum (Buffalo Clover)	Western Highland Rim Prairie and Barrens			Suit			
Plant	Trillium decumbens (Trailing Trillium)	Southern and Central Appalachian Cove Forest						Suit
Plant	Trillium decumbens (Trailing Trillium)	South-Central Interior Small Stream and Riparian						Marg
Plant	Trillium lancifolium (Narrow-leaved Trillium)	South-Central Interior Mesophytic Forest				Suit	Suit	
Plant	Trillium lancifolium (Narrow-leaved Trillium)	South-Central Interior Small Stream and Riparian				Marg	Marg	
Plant	Trillium lancifolium (Narrow-leaved Trillium)	South-Central Interior Large Floodplain				Suit	Suit	
Plant	Trillium pusillum (Least Trillium)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Trillium pusillum (Least Trillium)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit		
Plant	Trillium pusillum (Least Trillium)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Trillium pusillum (Least Trillium)	South-Central Interior Small Stream and Riparian			Marg			
Plant	Trillium pusillum (Least Trillium)	South-Central Interior Large Floodplain			Suit			
Plant	Trillium rugelii (Southern Nodding Trillium)	South-Central Interior Mesophytic Forest					Suit	
Plant	Trillium rugelii (Southern Nodding Trillium)	Southern and Central Appalachian Cove Forest					Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Trillium rugelii (Southern Nodding Trillium)	Southern Appalachian Oak Forest					Marg	Marg
Plant	Trillium rugelii (Southern Nodding Trillium)	Appalachian (Hemlock)-Northern Hardwood Forest					Marg	Marg
Plant	Trillium rugelii (Southern Nodding Trillium)	South-Central Interior Small Stream and Riparian					Marg	Marg
Plant	Trillium rugelii (Southern Nodding Trillium)	South-Central Interior Large Floodplain					Suit	Suit
Plant	Turritis glabra (Tower-mustard)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Pref				
Plant	Turritis glabra (Tower-mustard)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Turritis glabra (Tower-mustard)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Plant	Turritis glabra (Tower-mustard)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit	Suit			
Plant	Turritis glabra (Tower-mustard)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit			
Plant	Turritis glabra (Tower-mustard)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Tsuga caroliniana (Carolina Hemlock)	Southern and Central Appalachian Cove Forest						Marg
Plant	Tsuga caroliniana (Carolina Hemlock)	Southern Appalachian Oak Forest					Marg	Suit
Plant	Tsuga caroliniana (Carolina Hemlock)	Southern Appalachian Montane Pine Forest and Woodland					Suit	Pref
Plant	Ulmus crassifolia (Cedar Elm)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Plant	Ulmus crassifolia (Cedar Elm)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Ulmus crassifolia (Cedar Elm)	Mississippi River Riparian Forest	Suit					
Plant	Ulmus crassifolia (Cedar Elm)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Plant	Ulmus crassifolia (Cedar Elm)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Plant	Ulmus crassifolia (Cedar Elm)	Mississippi River Bottomland Depression	Suit					
Plant	Utricularia cornuta (Horned Bladderwort)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Utricularia inflata (Inflated Bladderwort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit		
Plant	Utricularia inflata (Inflated Bladderwort)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Utricularia inflata (Inflated Bladderwort)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Utricularia resupinata (Resupinate Bladderwort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond				Suit	Suit	
Plant	Utricularia resupinata (Resupinate Bladderwort)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Utricularia resupinata (Resupinate Bladderwort)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Utricularia subulata (Zigzag Bladderwort)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Utricularia subulata (Zigzag Bladderwort)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Suit		
Plant	Vaccinium elliottii (Mayberry)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Vaccinium elliottii (Mayberry)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Plant	Vaccinium macrocarpon (Cranberry)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Vaccinium macrocarpon (Cranberry)	Cumberland Wet-Mesic Meadow and Savanna				Marg		

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Plant	Vaccinium macrocarpon (Cranberry)	Cumberland Seepage Forest				Marg		
Plant	Vaccinium macrocarpon (Cranberry)	Southern and Central Appalachian Bog and Fen						Pref
Plant	Vaccinium macrocarpon (Cranberry)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg		
Plant	Veronica americana (American Speedwell)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Veronica americana (American Speedwell)	Southern Appalachian Seepage Wetland						Suit
Plant	Veronica americana (American Speedwell)	South-Central Interior Small Stream and Riparian						Suit
Plant	Veronica catenata (Sessile Water-speedwell)	South-Central Interior Small Stream and Riparian			Suit			
Plant	Veronica catenata (Sessile Water-speedwell)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Plant	Veronica scutellata (Marsh-speedwell)	Southern and Central Appalachian Bog and Fen						Suit
Plant	Veronica scutellata (Marsh-speedwell)	South-Central Interior Small Stream and Riparian						Marg
Plant	Veronica scutellata (Marsh-speedwell)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Plant	Viburnum bracteatum (Limerock Arrowwood)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref		
Plant	Viburnum molle (Softleaf Arrow-wood)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Plant	Viburnum molle (Softleaf Arrow-wood)	South-Central Interior Mesophytic Forest			Suit			
Plant	Viburnum molle (Softleaf Arrow-wood)	Central Interior Calcareous Cliff and Talus			Pref			
Plant	Viola tripartita var. tripartita (Three-parted Violet)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Plant	Viola tripartita var. tripartita (Three-parted Violet)	South-Central Interior Mesophytic Forest				Pref	Pref	
Plant	Viola tripartita var. tripartita (Three-parted Violet)	Southern and Central Appalachian Cove Forest					Suit	
Plant	Vitis rupestris (Sand Grape)	South-Central Interior Small Stream and Riparian			Suit		Suit	
Plant	Vitis rupestris (Sand Grape)	South-Central Interior Large Floodplain			Suit		Suit	
Plant	Vitis rupestris (Sand Grape)	Central Interior Calcareous Cliff and Talus			Suit			
Plant	Vitis rupestris (Sand Grape)	Southern Interior Calcareous Cliff					Suit	
Plant	Woodsia scopulina ssp. appalachiana (Alleghany Cliff-fern)	Southern Appalachian Montane Cliff and Talus						Pref
Plant	Woodwardia virginica (Virginia Chainfern)	Cumberland Wet-Mesic Meadow and Savanna				Marg		
Plant	Woodwardia virginica (Virginia Chainfern)	Cumberland Seepage Forest				Suit		
Plant	Woodwardia virginica (Virginia Chainfern)	Southern and Central Appalachian Bog and Fen						Marg
Plant	Woodwardia virginica (Virginia Chainfern)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Pref		
Plant	Xerophyllum asphodeloides (Eastern Turkeybeard)	Allegheny-Cumberland Dry Oak Forest and Woodland						Suit
Plant	Xerophyllum asphodeloides (Eastern Turkeybeard)	Southern Appalachian Oak Forest						Suit
Plant	Xerophyllum asphodeloides (Eastern Turkeybeard)	Southern Appalachian Low-Elevation Pine Forest						Suit
Plant	Xerophyllum asphodeloides (Eastern Turkeybeard)	Southern Appalachian Montane Pine Forest and Woodland						Pref
Plant	Xyris ambigua (Coastal Plain Yellow-eyed Grass)	Cumberland Wet-Mesic Meadow and Savanna				Suit		
Plant	Xyris ambigua (Coastal Plain Yellow-eyed Grass)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Pref		
Plant	Xyris fimbriata (Fringed Yellow-eyed Grass)	Central Interior Highlands and Appalachian Sinkhole and			Pref			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Depression Pond						
Plant	Xyris laxifolia var. iridifolia (Wide-leaved Yellow-eyed Grass)	Eastern Highland Rim Prairie and Barrens			Suit			
Plant	Xyris laxifolia var. iridifolia (Wide-leaved Yellow-eyed Grass)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref			
Plant	Xyris tennesseensis (Tennessee Yellow-eyed Grass)	Interior Low Plateau Seepage Fen			Pref			
Plant	Zanthoxylum americanum (Northern Prickly-ash)	Nashville Basin Limestone Glade and Woodland			Suit			
Plant	Zanthoxylum americanum (Northern Prickly-ash)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Plant	Zanthoxylum americanum (Northern Prickly-ash)	South-Central Interior Small Stream and Riparian			Suit			
Plant	Zigadenus glaucus (White Camas)	Southern Interior Calcareous Cliff						Suit
Plant	Zigadenus leimanthoides (Death-camas)	Eastern Highland Rim Prairie and Barrens			Pref			
Plant	Zigadenus leimanthoides (Death-camas)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Pref	Suit		
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Reptile	Anolis carolinensis (Green Anole)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Anolis carolinensis (Green Anole)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Reptile	Anolis carolinensis (Green Anole)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Anolis carolinensis (Green Anole)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Anolis carolinensis (Green Anole)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Reptile	Anolis carolinensis (Green Anole)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	Southern Appalachian Oak Forest					Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	Southern Appalachian Northern Hardwood Forest						Suit
Reptile	Anolis carolinensis (Green Anole)	Southern Appalachian Low-Elevation Pine Forest			Suit	Marg	Marg	Marg
Reptile	Anolis carolinensis (Green Anole)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Reptile	Anolis carolinensis (Green Anole)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Reptile	Anolis carolinensis (Green Anole)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Reptile	Anolis carolinensis (Green Anole)	Cumberland Seepage Forest				Marg		
Reptile	Anolis carolinensis (Green Anole)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Reptile	Anolis carolinensis (Green Anole)	Central Interior Highlands and Appalachian Sinkhole and			Marg		Marg	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Depression Pond						
Reptile	Anolis carolinensis (Green Anole)	Interior Low Plateau Seepage Fen			Marg			
Reptile	Anolis carolinensis (Green Anole)	Southern Appalachian Seepage Wetland						Marg
Reptile	Anolis carolinensis (Green Anole)	South-Central Interior Small Stream and Riparian		Marg	Marg		Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	South-Central Interior Large Floodplain			Marg		Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	Central Interior Acidic Cliff and Talus			Suit			
Reptile	Anolis carolinensis (Green Anole)	Central Interior Calcareous Cliff and Talus			Suit			
Reptile	Anolis carolinensis (Green Anole)	Cumberland Acidic Cliff and Rockhouse				Suit	Suit	
Reptile	Anolis carolinensis (Green Anole)	Southern Appalachian Montane Cliff and Talus				Marg	Marg	Marg
Reptile	Anolis carolinensis (Green Anole)	Southern Interior Calcareous Cliff					Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	Urban / Suburban Managed Forestland	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Anolis carolinensis (Green Anole)	Edifice / Other Man-made Structure	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Central Interior Highlands Calcareous Glade and Barrens		Suit	Suit			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Nashville Basin Limestone Glade and Woodland			Marg			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Western Highland Rim Prairie and Barrens			Pref			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Eastern Highland Rim Prairie and Barrens			Pref			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Mississippi River High Floodplain (Bottomland) Forest	Marg					
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Mississippi River Riparian Forest	Marg					
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Mississippi River Bottomland Depression	Suit					
Reptile	Clonophis kirtlandii (Kirtlands Snake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Central Interior Highlands and Appalachian Sinkhole and			Marg			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Depression Pond						
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Interior Low Plateau Seepage Fen			Marg			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	South-Central Interior Large Floodplain			Marg			
Reptile	Clonophis kirtlandii (Kirtlands Snake)	Old Field / Successional			Marg			
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Coluber flagellum (Coachwhip)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Coluber flagellum (Coachwhip)	South-Central Interior Mesophytic Forest		Suit				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Reptile	Coluber flagellum (Coachwhip)	Central Interior Highlands Dry Acidic Glade and Barrens		Suit				
Reptile	Coluber flagellum (Coachwhip)	Central Interior Highlands Calcareous Glade and Barrens		Suit				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Reptile	Coluber flagellum (Coachwhip)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Reptile	Coluber flagellum (Coachwhip)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Coluber flagellum (Coachwhip)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Coluber flagellum (Coachwhip)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Coluber flagellum (Coachwhip)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Coluber flagellum (Coachwhip)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Coluber flagellum (Coachwhip)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Pref	Suit	
Reptile	Crotalus horridus (Timber Rattlesnake)	Allegheny-Cumberland Dry Oak Forest and Woodland				Pref	Suit	
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Northern Loess Bluff Forest		Pref				
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Oak Forest					Pref	Pref
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Northern Hardwood Forest						Suit
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Reptile	Crotalus horridus (Timber Rattlesnake)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Appalachian Shale Barrens				Marg		
Reptile	Crotalus horridus (Timber Rattlesnake)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Suit	Marg	Marg	
Reptile	Crotalus horridus (Timber Rattlesnake)	Nashville Basin Limestone Glade and Woodland			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Cumberland Sandstone Glade and Barrens				Marg		
Reptile	Crotalus horridus (Timber Rattlesnake)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Marg				
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Reptile	Crotalus horridus (Timber Rattlesnake)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Western Highland Rim Prairie and Barrens			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Eastern Highland Rim Prairie and Barrens			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Ridge and Valley Patch Prairie					Marg	
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Grass and Shrub Bald						Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Reptile	Crotalus horridus (Timber Rattlesnake)	Mississippi River Riparian Forest	Pref					
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Reptile	Crotalus horridus (Timber Rattlesnake)	Cumberland Seepage Forest				Marg		
Reptile	Crotalus horridus (Timber Rattlesnake)	Mississippi River Bottomland Depression	Pref					
Reptile	Crotalus horridus (Timber Rattlesnake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Reptile	Crotalus horridus (Timber Rattlesnake)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg	Marg	Marg	
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Seepage Wetland						Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Crotalus horridus (Timber Rattlesnake)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Reptile	Crotalus horridus (Timber Rattlesnake)	Central Interior Acidic Cliff and Talus			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Central Interior Calcareous Cliff and Talus			Suit			
Reptile	Crotalus horridus (Timber Rattlesnake)	Southern Appalachian Montane Cliff and Talus				Suit	Suit	Suit
Reptile	Crotalus horridus (Timber Rattlesnake)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Crotalus horridus (Timber Rattlesnake)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Converted Wetland (Lacustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Converted Wetland (Riverine)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Crotalus horridus (Timber Rattlesnake)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Glyptemys muhlenbergii (Bog Turtle)	Southern and Central Appalachian Bog and Fen						Pref
Reptile	Glyptemys muhlenbergii (Bog Turtle)	Southern Appalachian Seepage Wetland						Suit
Reptile	Glyptemys muhlenbergii (Bog Turtle)	South-Central Interior Small Stream and Riparian						Suit
Reptile	Glyptemys muhlenbergii (Bog Turtle)	Old Field / Successional	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Glyptemys muhlenbergii (Bog Turtle)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Glyptemys muhlenbergii (Bog Turtle)	Converted Wetland (Palustrine)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Appalachian Oak Forest					Suit	Suit
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Appalachian Northern Hardwood Forest						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Pref				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Marg			
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg	Marg	Marg	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Nashville Basin Limestone Glade and Woodland			Marg			
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Cumberland Sandstone Glade and Barrens				Marg		
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Western Highland Rim Prairie and Barrens			Suit			
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Eastern Highland Rim Prairie and Barrens			Suit			
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Ridge and Valley Patch Prairie					Suit	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Cumberland Seepage Forest				Marg		
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Appalachian Seepage Wetland						Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	South-Central Interior Small Stream and Riparian		Suit	Suit	Suit	Suit	Suit
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Southern Appalachian Montane Cliff and Talus				Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Heterodon platirhinos (Eastern Hognosed Snake)	Excavated Land (Strip Mine / Road Cut / Rock Quarry /	Marg	Marg	Marg	Marg	Marg	Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Gravel Pit)						
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	Mississippi River Riparian Forest	Pref					
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	Mississippi River Bottomland Depression	Pref					
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	South-Central Interior Small Stream and Riparian		Pref				
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia cyclopion (Mississippi Green Watersnake)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	Mississippi River Low Floodplain (Bottomland) Forest	Pref					
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	Mississippi River Riparian Forest	Pref					
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	Mississippi River Bottomland Depression	Pref					
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	South-Central Interior Small Stream and Riparian		Pref				
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia erythrogaster flavigaster (Yellowbelly Water Snake)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia erythrogaster neglecta (Copperbelly Watersnake)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Reptile	Nerodia erythrogaster neglecta (Copperbelly Watersnake)	South-Central Interior Small Stream and Riparian			Pref			
Reptile	Nerodia erythrogaster neglecta (Copperbelly Watersnake)	South-Central Interior Large Floodplain			Pref			
Reptile	Nerodia erythrogaster neglecta (Copperbelly Watersnake)	Converted Wetland (Lacustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia erythrogaster neglecta (Copperbelly Watersnake)	Converted Wetland (Riverine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Nerodia erythrogaster neglecta (Copperbelly Watersnake)	Converted Wetland (Palustrine)	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Ridge and Valley / Cumberland Dry Calcareous				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
		Forest						
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Appalachian Oak Forest					Suit	Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Appalachian Northern Hardwood Forest						Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Marg			
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Appalachian Shale Barrens				Marg	Marg	Marg
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg	Marg	Marg	
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Nashville Basin Limestone Glade and Woodland			Marg			
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Cumberland Sandstone Glade and Barrens				Marg		
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Pref				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Pref				
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Pennyroyal Karst Plain Prairie and Barrens			Pref			
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Western Highland Rim Prairie and Barrens			Pref			
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Eastern Highland Rim Prairie and Barrens			Pref			
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Southern Ridge and Valley Patch Prairie					Pref	
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Forest Plantation	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Ophisaurus attenuatus longicaudus (Eastern Slender Glass Lizard)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	South-Central Interior Mesophytic Forest			Suit	Suit	Suit	
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern and Central Appalachian Cove Forest				Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Appalachian Oak Forest					Suit	Suit
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Appalachian Northern Hardwood Forest						Suit
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Appalachian Low-Elevation Pine Forest			Suit	Pref	Pref	Pref
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Appalachian (Hemlock)-Northern Hardwood Forest				Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Central Interior Highlands Dry Acidic Glade and Barrens			Marg			
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Appalachian Shale Barrens				Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Central Interior Highlands Calcareous Glade and Barrens			Marg	Marg	Marg	
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Nashville Basin Limestone Glade and Woodland			Marg			
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Cumberland Sandstone Glade and Barrens				Marg		
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern and Central Appalachian Mafic Glade and Barrens						Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Pennyroyal Karst Plain Prairie and Barrens			Suit			
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Western Highland Rim Prairie and Barrens			Suit			
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Eastern Highland Rim Prairie and Barrens			Suit			
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Southern Ridge and Valley Patch Prairie					Suit	
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Forest Plantation	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Pituophis melanoleucus melanoleucus (Northern Pinesnake)	Excavated Land (Strip Mine / Road Cut / Rock Quarry / Gravel Pit)	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Reptile	Plestiodon anthracinus (Coal Skink)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Reptile	Plestiodon anthracinus (Coal Skink)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Marg	Marg	
Reptile	Plestiodon anthracinus (Coal Skink)	Allegheny-Cumberland Dry Oak Forest and Woodland				Marg	Marg	
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Plestiodon anthracinus (Coal Skink)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Plestiodon anthracinus (Coal Skink)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Reptile	Plestiodon anthracinus (Coal Skink)	Southern and Central Appalachian Cove Forest				Suit	Marg	Suit
Reptile	Plestiodon anthracinus (Coal Skink)	Southern Appalachian Oak Forest					Marg	Marg
Reptile	Plestiodon anthracinus (Coal Skink)	Southern Appalachian Northern Hardwood Forest						Suit
Reptile	Plestiodon anthracinus (Coal Skink)	Southern Appalachian Low-Elevation Pine Forest			Marg	Marg	Marg	Marg
Reptile	Plestiodon anthracinus (Coal Skink)	Southern Appalachian Montane Pine Forest and Woodland				Marg	Marg	Marg
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Reptile	Plestiodon anthracinus (Coal Skink)	Appalachian (Hemlock)-Northern Hardwood Forest				Pref	Pref	Pref
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				
Reptile	Plestiodon anthracinus (Coal Skink)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Reptile	Plestiodon anthracinus (Coal Skink)	Cumberland Seepage Forest				Suit		
Reptile	Plestiodon anthracinus (Coal Skink)	Southern and Central Appalachian Bog and Fen					Suit	Suit
Reptile	Plestiodon anthracinus (Coal Skink)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Reptile	Plestiodon anthracinus (Coal Skink)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Reptile	Plestiodon anthracinus (Coal Skink)	Interior Low Plateau Seepage Fen			Suit			
Reptile	Plestiodon anthracinus (Coal Skink)	South-Central Interior Small Stream and Riparian		Pref	Pref	Pref	Pref	Pref
Reptile	Plestiodon anthracinus (Coal Skink)	South-Central Interior Large Floodplain			Suit	Suit	Suit	Suit
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	South-Central Interior Mesophytic Forest		Suit	Suit			
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	Southern Appalachian Low-Elevation Pine Forest			Suit			
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Pref				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Large River Floodplain Forest		Pref				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Pref				

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	East Gulf Coastal Plain Northern Seepage Swamp		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Suit				
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit			
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	Interior Low Plateau Seepage Fen			Marg			
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	South-Central Interior Small Stream and Riparian		Pref	Suit			
Reptile	Sistrurus miliarius streckeri (Western Pygmy Rattlesnake)	South-Central Interior Large Floodplain			Pref			
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Suit			
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Ridge and Valley / Cumberland Dry Calcareous Forest				Suit	Suit	
Reptile	Terrapene carolina (Eastern Box Turtle)	Allegheny-Cumberland Dry Oak Forest and Woodland				Suit	Suit	Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	South-Central Interior Mesophytic Forest		Suit	Suit	Suit	Suit	
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern and Central Appalachian Cove Forest				Suit	Suit	Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Appalachian Oak Forest					Suit	Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Appalachian Northern Hardwood Forest						Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Appalachian Low-Elevation Pine Forest			Suit	Suit	Suit	Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Appalachian Montane Pine Forest and Woodland				Suit	Suit	Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	Central and Southern Appalachian Spruce-Fir Forest						Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Suit				
Reptile	Terrapene carolina (Eastern Box Turtle)	Appalachian (Hemlock)-Northern Hardwood Forest				Suit	Suit	Suit
Reptile	Terrapene carolina (Eastern Box Turtle)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg	Marg			
Reptile	Terrapene carolina (Eastern Box Turtle)	Appalachian Shale Barrens				Marg	Marg	Marg
Reptile	Terrapene carolina (Eastern Box Turtle)	Central Interior Highlands Calcareous Glade and Barrens		Marg	Marg	Marg	Marg	
Reptile	Terrapene carolina (Eastern Box Turtle)	Nashville Basin Limestone Glade and Woodland			Marg			
Reptile	Terrapene carolina (Eastern Box Turtle)	Cumberland Sandstone Glade and Barrens				Marg		
Reptile	Terrapene carolina (Eastern Box Turtle)	Ridge and Valley Calcareous Valley Bottom Glade and Woodland					Marg	
Reptile	Terrapene carolina (Eastern Box Turtle)	Central Appalachian Alkaline Glade and Woodland					Marg	
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern and Central Appalachian Mafic Glade and Barrens						Marg

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Marg				
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Reptile	Terrapene carolina (Eastern Box Turtle)	Pennyroyal Karst Plain Prairie and Barrens			Marg			
Reptile	Terrapene carolina (Eastern Box Turtle)	Western Highland Rim Prairie and Barrens			Marg			
Reptile	Terrapene carolina (Eastern Box Turtle)	Eastern Highland Rim Prairie and Barrens			Marg			
Reptile	Terrapene carolina (Eastern Box Turtle)	Cumberland Wet-Mesic Meadow and Savanna				Marg		
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Ridge and Valley Patch Prairie					Marg	
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Appalachian Grass and Shrub Bald						Marg
Reptile	Terrapene carolina (Eastern Box Turtle)	Mississippi River High Floodplain (Bottomland) Forest	Marg					
Reptile	Terrapene carolina (Eastern Box Turtle)	Mississippi River Low Floodplain (Bottomland) Forest	Marg					
Reptile	Terrapene carolina (Eastern Box Turtle)	Mississippi River Riparian Forest	Marg					
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Large River Floodplain Forest		Marg				
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Marg				
Reptile	Terrapene carolina (Eastern Box Turtle)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Reptile	Terrapene carolina (Eastern Box Turtle)	Cumberland Seepage Forest				Marg		
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern and Central Appalachian Bog and Fen					Marg	Marg
Reptile	Terrapene carolina (Eastern Box Turtle)	Mississippi River Bottomland Depression	Marg					
Reptile	Terrapene carolina (Eastern Box Turtle)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Reptile	Terrapene carolina (Eastern Box Turtle)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Suit	Suit	Suit	
Reptile	Terrapene carolina (Eastern Box Turtle)	Interior Low Plateau Seepage Fen			Suit			
Reptile	Terrapene carolina (Eastern Box Turtle)	Southern Appalachian Seepage Wetland						Suit
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	Southern Interior Low Plateau Dry-Mesic Oak Forest			Marg			
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Northern Loess Bluff Forest		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	South-Central Interior / Upper Coastal Plain Flatwoods		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Limestone Forest		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	South-Central Interior Mesophytic Forest		Marg	Marg			
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	Pennyroyal Karst Plain Prairie and Barrens			Suit			

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Reptile	Thamnophis proximus (Western Ribbonsnake)	Western Highland Rim Prairie and Barrens			Suit			
Reptile	Thamnophis proximus (Western Ribbonsnake)	Eastern Highland Rim Prairie and Barrens			Suit			
Reptile	Thamnophis proximus (Western Ribbonsnake)	Mississippi River High Floodplain (Bottomland) Forest	Suit					
Reptile	Thamnophis proximus (Western Ribbonsnake)	Mississippi River Low Floodplain (Bottomland) Forest	Suit					
Reptile	Thamnophis proximus (Western Ribbonsnake)	Mississippi River Riparian Forest	Suit					
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Large River Floodplain Forest		Suit				
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Small Stream and River Floodplain Forest		Suit				
Reptile	Thamnophis proximus (Western Ribbonsnake)	East Gulf Coastal Plain Northern Seepage Swamp		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	South-Central Interior / Upper Coastal Plain Wet Flatwoods		Marg				
Reptile	Thamnophis proximus (Western Ribbonsnake)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond			Marg			
Reptile	Thamnophis proximus (Western Ribbonsnake)	Interior Low Plateau Seepage Fen			Marg			
Reptile	Thamnophis proximus (Western Ribbonsnake)	South-Central Interior Small Stream and Riparian		Suit	Suit			
Reptile	Thamnophis proximus (Western Ribbonsnake)	Old Field / Successional	Marg	Marg	Marg			
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Northern Loess Bluff Forest		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	South-Central Interior / Upper Coastal Plain Flatwoods		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Limestone Forest		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	South-Central Interior Mesophytic Forest		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest		Marg				
Reptile	Virginia striatula (Rough Earth Snake)	Central Interior Highlands Dry Acidic Glade and Barrens		Marg				
Reptile	Virginia striatula (Rough Earth Snake)	Central Interior Highlands Calcareous Glade and Barrens		Marg				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Jackson Plain Prairie and Barrens		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland		Suit				
Reptile	Virginia striatula (Rough Earth Snake)	Urban / Suburban Managed Forestland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Virginia striatula (Rough Earth Snake)	Old Field / Successional	Suit	Suit	Suit	Suit	Suit	Suit
Reptile	Virginia striatula (Rough Earth Snake)	Pasture	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Virginia striatula (Rough Earth Snake)	Cropland	Marg	Marg	Marg	Marg	Marg	Marg
Reptile	Virginia striatula (Rough Earth Snake)	Urban / Suburban Managed Grassland	Marg	Marg	Marg	Marg	Marg	Marg
Tardigrade	Calohypsibius schusteri (Schuster's Tardigrade)	Central and Southern Appalachian Spruce-Fir Forest						Pref
Tardigrade	Hypsibius roanensis (Roan Tardigrade)	Southern Appalachian Montane Pine Forest and Woodland						Suit

Taxa Group	Scientific & Common Name	Habitat type (ecological system)	MAP	UGCP	ILP	CPM	RV	SBR
Tardigrade	Hypsibius roanensis (Roan Tardigrade)	Central and Southern Appalachian Spruce-Fir Forest						Pref

Tennessee State Wildlife Action Plan 2015

Appendix E - Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

Major Stresses Affecting GCN Species by Category and Type (Table 11 from 2005 SWAP, p. 67)	
Stress Category	**Stress Type**
Altered Structure of Habitat	1. Destruction of Habitat 2. Altered Arrangement of Habitat (vertical & horizontal) 3. Altered Distribution or Abundance of Patch/Seral Stages of Habitat
Altered Physical Environment of Habitat	1. Altered Energy Regime (food source, organic matter, UV radiation) 2. Altered Hydrologic Regimes (surface water level, discharge, frequency, groundwater) 3. Altered Sediment Regime (air & water borne) 4. Altered Fire Regime (frequency, intensity, seasonality) 5. Altered Micro-climate Regime (air/water/soil temperature, precipitation, wind, light)
Altered Chemical Environment of Habitat	1. Altered Water Quality (toxins, nutrient loading, pH, salinity, dissolved oxygen) 2. Altered Soil Quality (toxins, nutrient loading, ion exchange, dissolved oxygen, redox potential) 3. Altered Air Quality (toxins)
Altered Connectivity of Habitat	1. Isolation From Habitats and Resources Needed for Life Cycle Completion (migration, dispersal, recolonization, foraging, mating) 2. Isolation Resulting in Reduced Opportunity for Range Adjustment in Response to Changing Environmental Conditions
Altered Biological Composition & Interaction of Species	1. Altered Species Distribution (density, richness, evenness) 2. Altered Population Demographics (age structure, size class, sex ratios, genetic diversity) 3. Altered Reproduction (hybridization/sterilization) 4. Altered Availability of Food Source 5. Altered Competition for Resources 6. Altered Mutualistic / Symbiotic Relationships 7. Altered Behavior

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

Descriptions of Potential Sources of Stress to GCN Species (Table 13 from 2005 SWAP, p. 69-72)	
Source of Stress Category	**Description**
Acid Rain	Destruction or degradation of terrestrial & aquatic habitat from precipitation in the low pH range (acid). Acid rain results from emissions of various pollutants by powerplants, factories, automobiles, and other sources.
Agricultural Conversion	Removal of the natural vegetation of an area for agricultural purposes such as: pasture, row crops, feed lots, outbuildings, etc.
Channelization of Rivers/ Streams	Alteration of the natural course of a river or stream by removing rock, dirt, gravel, and other sediments from shorelines and bottoms. Such alteration is done primarily for navigation and flood control purposes.
Commercial Collection of Species	Increased mortality due to legal taking or killing of species for commercial purposes such as: pet trade, live bait, mussel collection for pearl industry, fur trade, smelt production, etc.
Commercial/Industrial Development	Destruction or degradation of habitats in an area due to construction and other activities related to the development of commercial or industrial buildings.
Construction of dams/ impoundments	Disruption and degradation of the natural flow of a river or stream due to construction of dams or impoundments. Also includes destruction of terrestrial habitats due to removal and inundation of vegetation along shorelines.
Construction of Ditches / Dikes Drainage / Diversion Systems	Disruption and degradation of the natural hydrologic patterns of wetlands, rivers, and streams due to construction of various water diversionary or containment structures.
Construction of Roads/ Railroads/Utilities	Destruction or degradation of habitats in an area due to construction of roads, railroads, or utilities. The linear makeup of these corridors often fragment terrestrial habitats.
Excessive Competition/ Predation by Native Species	Increased mortality of animals resulting from either excessive take by predators or by the inability to compete with other species for food and resources.
Excessive Groundwater Withdrawal	Removal of groundwater resources essential to maintenance of hydrologic levels that support aquatic and subterranean species. Withdrawal is primarily from wells drilled for home water supply, irrigation, and other agricultural uses.
Excessive Surface Water Withdrawal	Removal of surfacewater resources needed to maintain hydrologic levels for aquatic and subterranean species.
Fire Suppression	Degradation of fire-dependent natural systems due to either human suppression of fire or the conditions needed to support combustion.
Forest Type Conversion	Any anthropogenic action that results in significant change in forest composition or type.
Illegal Dumping	Increased mortality or degradation of habitats due to illegal disposal of waste products containing pollutants harmful to animals.

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

Descriptions of Potential Sources of Stress to GCN Species (Table 13 from 2005 SWAP, p. 69-72)	
Source of Stress Category	**Description**
Illegal Hunting/Fishing/ Collection/Killing	Increased mortality of animals due to illegal acts of hunting, fishing, commercial collection, killing, vandalism, or other activities.
Incompatible Animal Production Practices	Degradation of soil & water quality via improper management of animal waste or chemical applications required during the rearing of livestock or other farm animals raised in concentrated conditions.
Incompatible Forestry Practices	Modification of the forest composition or type of an area related to silvicultural (in)activities not compatible with species or habitat.
Incompatible Grazing/ Pasture Management Practices	Degradation of soil & water quality and habitat structure of an area due to excessive grazing or to Inappropriate exclusion of cattle from stream and forest resources. Also, includes degradation caused by overapplication of fertilizers or other chemicals during pasture management practices.
Incompatible Mining Practices	Destruction or degradation of soil & water quality and habitat structure of an area due to inappropriate removal of soil and minerals or disposal of overburden or waste materials during various mining activities. May also affect subterranean habitats.
Incompatible Row Crop Agriculture Practices	Degradation of soil - water quality or habitat structure related to row crop production and maintenance not compatible with species needs. Often due to erosion from plowing/tilling or chemical applications of herbicides/pesticides.
Incompatible Species Management Practices	Increased mortality or degradation of habitats resulting from the application of management practices that conflict with the ecological needs of a particular species.
Industrial Discharge	Increased mortality or degradation of habitats resulting from legal or illegal releases of toxins or contaminants into the environment by various industries.
Invasive Exotic Species	Increased mortality or habitat degradation caused by excessive competition or predation from invasive exotic species.
Landfill Construction/ Operation	Destruction or degradation of habitats due to construction and maintenance of county or municipal landfill operations. Also, includes habitat degradation and increased mortality caused by releases of toxins and other contaminants into the environment.
Low-level Ozone Air Pollution	Destruction or degradation of natural vegetation from the accumulation of toxic ozone in the lower atmosphere, usually in higher elevation regions of the state. Ozone results from emissions of various pollutants by powerplants, factories, automobiles, and other sources.
Military Maneuvers	Increased mortality of species or destruction / degradation of habitats due to the use of heavy vehicles or explosives on the landscape during military exercises.

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

Descriptions of Potential Sources of Stress to GCN Species (Table 13 from 2005 SWAP, p. 69-72)	
Source of Stress Category	**Description**
Municipal Wastewater Treatment/Stormwater Runoff	Degradation of water quality resulting from ineffective treatment of municipal wastewater released into rivers and streams. Also, includes ineffective capture and treatment of stormwater runoff which is often contaminated by various pollutants.
Oil or Natural Gas Drilling	Degradation of soil and water quality due to release or spillage of oil, brine, and other chemicals during drilling for oil or natural gas deposits. May also affect subterranean habitats.
Operation of Dams/ Reservoirs	Degradation of water quality and aquatic habitat availability due to disruption of natural hydrologic regimes of rivers and streams by dams or reservoirs. Also, includes destruction / degradation of terrestrial habitats due to periodic raising or lower of water levels.
Operation of Drainage/ Diversion Systems	Degradation of water quality and habitat availability due to disruption of natural hydrologic regimes of rivers, streams, & wetlands by the operation of drainage ditches, dikes, and other water diversionary & containment structures.
Parasites/Pathogens	Increased mortality of species due to high levels of parasites or disease-causing pathogens.
Primary Residential Development	Destruction or degradation of habitats due to construction activities associated with the building of primary residences.
Recreational Use of Habitats (Non-vehicular)	Destruction and degradation of habitats and increased mortality of species due to excessive levels of recreational activities or inappropriate usage of habitats for recreation.
Recreational Vehicles	Destruction and degradation of habitats and increased mortality of species due to excessive levels of recreational vehicle traffic or inappropriate usage of habitats for recreational vehicles.
Residential Sewage/Septic Systems	Degradation of water quality resulting from ineffective treatment of residential sewage by septic systems. Often caused by older, defective sewage systems or by poorly-sited septic tanks.
Secondary Home/Resort Development	Destruction or degradation of habitats due to construction activities associated with the building of secondary/vacation homes and resort developments.
Shoreline Stabilization	Degradation of water quality and destruction of habitats along shorelines during stabilization activities that cover stream banks with rock or other erosion- control structures (e.g. rip rap).

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

See **http://cmp-openstandards.org/using-os/tools/classification-beta-v-2-0/**

CMP Level 1	CMP Level 2 Label	CMP Level 2 Descriptor	TN-SWAP 2005 Source of Stress & 2015 additions*
Residential & Commercial Development	1.1	Housing & urban areas	Primary residential development
			Secondary home/resort development
	1.2	Commercial & industrial areas	Commercial/industrial development
			Landfill construction/operation (one sp)
			Military maneuvers
	1.3*	Tourism & recreation areas*	Tourism and recreation sites with a substantial footprint*
Agriculture and Aquaculture	2.1	Annual & perennial non-timber crops	Agricultural conversion (row crop; mostly historical)
			Incompatible row crop agricultural practices
	2.2	Wood and pulp plantations	Forest type conversion
	2.3	Livestock farming & ranching	Agricultural conversion (livestock, mostly historical)
			Incompatible animal production practices
			Incompatible grazing/pasture management practices
Energy Production & Mining	3.1	Oil & gas drilling	Oil or natural gas drilling

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

CMP Level 1	CMP Level 2 Label	CMP Level 2 Descriptor	TN-SWAP 2005 Source of Stress & 2015 additions*
Energy Production & Mining	3.2	Mining & quarrying	Incompatible mining practices
	3.3*	Renewable energy*	Exploring, developing, and producing renewable energy*
Transportation & Service Corridors	4.1	Roads & Railroads	Construction of roads/railroads/utilities
	4.2	Utility & service lines	Construction of roads/railroads/utilities
	4.3	Shipping lanes	Channelization of rivers/streams
Biological Resource Use	5.1	Hunting & collecting terrestrial animals	Illegal hunting/fishing/collection/killing
	5.2*	Gathering terrestrial plants*	Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons*
	5.3	Logging & wood harvesting	Incompatible forestry practices
	5.4	Fishing & harvesting aquatic resources	Commercial collection of species
Human Intrusions & Disturbance	6.1	Recreational activities	Recreational use of habitats (non-vehicular)
			Recreational vehicles
Natural System Modifications	7.1	Fire & Fire suppression	Fire suppression
	7.2	Dams & water management/use	Channelization of rivers/streams
			Construction of dams/impoundments

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

CMP Level 1	CMP Level 2 Label	CMP Level 2 Descriptor	TN-SWAP 2005 Source of Stress & 2015 additions*
Natural System Modifications			Construction of ditches/dikes/drainage/diversion systems
			Excessive groundwater withdrawal
			Excessive surface water withdrawal
			Operation of dams/reservoirs
			Operation of drainage/diversion systems
	7.3	Other ecosystem modifications	Incompatible species management practices
			Shoreline stabilization
Invasive & Problematic Species, Pathogens & Genes	8.1	Invasive non-native/alien species plants & animals	Invasive exotic species
	8.2	Problematic native plants & animals	Excessive competition/predation by native species
	8.4	Pathogens & Microbes	Parasites/pathogens
Pollution	9.1	Household sewage & urban waste water	Municipal wastewater treatment/stormwater runoff
			Residential sewage/septic systems
	9.2	Industrial & military effluents	Industrial discharge

APPENDIX E. Problems affecting GCN species and habitats. Major stresses and sources of stress (problems), including a crosswalk to the CMP 2.0 Beta Threats Classification.

CMP Level 1	CMP Level 2 Label	CMP Level 2 Descriptor	TN-SWAP 2005 Source of Stress & 2015 additions*
Pollution	9.3	Agriculture & forestry effluents	Incompatible animal production practices
			Incompatible Forestry Practices
			Incompatible grazing/pasture management practices
			Incompatible row crop agricultural practices
	9.4	Garbage & solid waste	Illegal dumping
	9.5	Air-borne pollutants	Acid rain
	9.5	Air-borne pollutants	Low-level ozone air pollution

* TN-SWAP sources of stress added during the 2015 update.

Tennessee State Wildlife Action Plan 2015

Appendix F - Climate Change and Potential Impacts to Wildlife in Tennessee, Factsheet

CLIMATE CHANGE and POTENTIAL IMPACTS TO **WILDLIFE IN TENNESSEE**

Tennessee is blessed with an abundance of wildlife and natural resources. From the peaks of the Great Smoky Mountains to the fertile farms of the Nashville Basin to the rich bottomlands along the Mississippi River, we are a state defined by our natural environment. Our forests, mountains, streams and caves provide habitat for an array of waterfowl, bats, salamanders, songbirds and fish, many of which are unique to Tennessee. These resources provide the state with a range of economic benefits, both directly (timber production, outdoor recreation) and indirectly (water purification, wildlife habitat).

Unfortunately, Tennessee's wildlife and natural resources face a serious threat from climate change. Warmer temperatures and changes in precipitation could disrupt the state's delicate forest and aquatic ecosystems. Furthermore, the cumulative impacts of climate change in concert with other sources of stress—pollution, sprawl, and invasive species—could produce significant impacts to Tennessee's incredible diversity of habitats and wildlife.

To better understand the threat, the Tennessee Wildlife Resources Agency has completed a comprehensive assessment of the potential impacts to wildlife and their habitats from a changing climate, which is projected to warm for the remainder of this century. Key findings from the study include:

- Tennessee's forests are expected to undergo changes in forest growth and composition, with some tree types expanding at the expense of others. Some high elevation forest types will be dramatically impacted or lost entirely.
- Brook trout populations are expected to decline as surface water temperatures increase.
- Migratory songbirds may alter their ranges, with some species disappearing from Tennessee altogether
- Larger floods and longer droughts could cause increased erosion, reduced water supply and the spread of invasive species.

If Tennessee hopes to preserve its rich biodiversity, we must take action today to help safeguard wildlife from the future threats of climate change. By developing strategies to address local climate change-related vulnerabilities, we can prevent the worst damage to our natural systems and the habitats that both people and wildlife depend upon.



TENNESSEE WILDLIFE RESOURCES AGENCY

NATIONAL WILDLIFE FEDERATION

The Nature Conservancy
Protecting nature. Preserving life.™

FROM BIRDS TO BASS: POTENTIAL IMPACTS ON TENNESSE'S WILDLIFE

Warmer temperatures, longer droughts, increased flooding and shifts on forest composition caused by climate change will significantly impact Tennessee's wildlife and the habitats upon which they depend.

Aquatic Resources and Fisheries

1. Tennessee's aquatic diversity - 320 species of fishes, 77 species of crayfishes, and 129 species of freshwater mussels - makes Tennessee one of the last strongholds of aquatic diversity. Effects on fish and mussel populations are expected to be greatest in mountainous parts of the Cumberland Plateau and east Tennessee where large numbers of rare endemic species exist.

2. The coldest headwaters and spring influenced habitats are at risk of being lost. Twenty-two greatest conservation need species are dependent on spring or headwater streams. Brook trout are likely to lose the most habitat. Brown and rainbow trout might be able to shift upstream in a warmer headwater habitat.

3. Both the Striped Bass and the walleye can be expected to lose habitat in a warming climate.

4. In large tributary reservoirs, an increase in temperature will negatively affect cool to coldwater fish habitat and possibly benefit some warmwater species. Losers could be trout, smallmouth bass and walleye. Winners could be largemouth bass, crappie, catfish and bluegill.

Birds

1. Birds found in wetlands and mature forests may suffer habitat declines in Tennessee due to habitat loss attributed to climate change.

2. Birds who live in grasslands, scrub-shrub, and pine or oak savannas, may benefit with increased habitat availability.

3. Duck populations wintering in Tennessee are expected to decline, with lower reproductive success on their breeding grounds in the northern prairies of Canada and the U.S. Warmer winter weather to the north will retain open water conditions, thus many birds will stay further north, which would adversely impact waterfowl hunting in Tennessee.

Mammals

1. Northern Flying Squirrels, Rock Voles and Red squirrels, which are found in high elevation, cool, humid habitats are at risk.

Caves and Bats

1. Karst aquifers are important to both to the surface and subsurface ecology of a region and to domestic water supplies. If drought cycles increase in regularity and intensity these ground water resources could disapear.

2. Indiana bats prefer cold air caves and will only hibernate in caves that have stable winter temperatures ranging from 37 - 43 degrees F. Caves that are currently at the upper end of this range could become unsuitable for Indiana bats.

> "With warming temperatures, the Tennessee River Basin is expected to undergo greater water stress during the remainder of the 21st century than other regional basins."







Reptiles and Amphibians

1. Increased winter temperatures could increase the threat of exotic species to native amphibian and reptile populations by increasing the survival rate of these invaders.

2. Range expansions or contractions of several frog species may occur as temperatures become warmer. Affected species could include the Bird-voiced Treefrog, Green Treefrog and the Wood Frog.

3. Rare endemic salamander species found only in high elevation, cool, humid habitats are at risk. Affected species could include the Junaluska Salamander and the Pygmy Salamander.



TENNESSEE'S UNPARALLELED BIODIVERSITY

- Tennessee has 77 amphibians including 21 species of frogs and 56 species of salamanders, making it the third most diverse state in amphibians.
- Dubbed the "Hardwood Capital of the World," Tennessee is the number one producer of hardwood flooring and is ranked second in the United States in hardwood lumber production.
- The Smoky Mountains have long been recognized as a global center of biodiversity. There are more tree species in the Smokies (130) than in all of Northern Europe.
- Tennessee is one of the nations most karst rich states. It is estimated that Tennessee has more than 9,000 caves.
- In 2002, Tennessee was ranked second nationally for number of fish species.

SAFEGUARDING WILDLIFE FROM CLIMATE CHANGE

Combating climate change requires a two-pronged approach. First, we must address the cause of climate change by reducing greenhouse gas emissions at the state, federal and global level. Second, we must address the inevitable impacts of climate change on wildlife and natural resources.

To achieve the latter, the Tennessee Wildlife Resources Agency, National Wildlife Federation, and The Nature Conservancy have identified the following as the most important and immediate strategies:

Protecting Key Ecosystem Features

Maintain or establish riparian buffers along streams to lessen impacts of temperature increases; Protect headwater streams of priority aquatic systems (e.g., Duck River, etc.); Maintain or establish corridors to facilitate migration routes for species and/or populations, and to facilitate gene flow.

Reduce Human-Associated Stresses

There are many human-associated stresses that will reduce the ability of species or ecosystems to withstand a stressful climatic event. A key issue in Tennessee and the southeastern region of the United States will be continued population growth, and the impacts of urbanization on the waters and landscapes of the region. Projections indicate that an additional 2 million people will make Tennessee their home by 2025, bringing our state's population to 8 million. Strategies to mitigate these stresses should be adopted as part of a climate change adaptation program.

Representation

Ensuring that biological systems come in a variety of forms will provide some level of resilience. We should maintain a mixture of habitat types, protect priority conservation areas identified in Tennessee's State Wildlife Action Plan, and maintain numerous viable populations for priority species as identified in the action plan.

CLIMATE CHANGE and TENNESSEE'S ECONOMY: WHAT'S AT RISK?

- Outdoor recreation contributes more than $6.3 billion annually to Tennessee's economy and supports 67,000 jobs across the state.
- Tennessee is home to around 787,000 acres of wetlands. A 20 percent loss of wetland acreage would cost the state from $55 million to nearly $4 billion.
- In 2000, the forest product industry accounted for 6.6. percent of Tennessee's GDP, generated $21.7 billion in economic output, and employed 180,000 people in the forest product industry.

Vulnerability Assessments

Research should be conducted to determine and identify those species and ecosystems that are most vulnerable to climate change.

Replication

Maintain numerous viable populations for priority species as identified in the action plan. Protect strategically important lands and waters through fee acquisition or conservation easement (Priority conservation areas identified in Tennessee's State Wildlife Action Plan).

Refugia

Refugia refers to areas or environments that are less affected by climate change than other areas. In many ways, strategies for creating refugia are included in the strategies above, such as representation or restoration. Acquisition and/or protection of subterranean systems may be good candidates for this strategy.

Monitoring and Adaptive Management

Long term monitoring systems that are strategically designed to evaluate climate change impacts and wildlife responses are a high priority for TWRA.

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Tennessee State Wildlife Action Plan 2015

Appendix G - Comprehensive hierarchy of Statewide Conservation Actions for GCN Species and Habitats

Appendix G: Comprehensive hierarchy of Statewide Conservation Actions for GCN Species

Class	General Action	Specific Action
Habitat acquisition	Fee-title Ownership	Use federal/state/private funding sources to acquire critical units of aquatic, subterranean, and terrestrial habitats which provide species protection, buffering, connectivity, and/or perpetuation of natural processes.
Habitat acquisition	Fee-title Ownership	Revive TN Protection Planning Committee to coordinate land acquisition priorities among state/federal agencies and non-governmental organizations.
Habitat acquisition	Permanent Protective Easements	Use federal/state/private funding sources to acquire permanent easements within critical units of aquatic, subterranean, and terrestrial habitats which provide species protection, buffering, connectivity, and/or perpetuation of natural processes.
Habitat acquisition	Permanent Protective Easements	Revive TN Protection Planning Committee to coordinate acquisition of permanent protective easements among state/federal agencies and non-governmental organizations.
Information collection and dispersal	Communications & Public Relations	Develop a multi-media public outreach campaign to promote the availability of government-funded incentive programs to private landowners.
Information collection and dispersal	Communications & Public Relations	Develop a multi-media public outreach campaign to promote awareness of the negative effects of invasive exotic species.
Information collection and dispersal	Communications & Public Relations	Develop a multi-media public outreach campaign to promote the need for conserving rare, threatened, or endangered species and habitats.
Information collection and dispersal	Conservation Planning	Develop/participate in regional conservation planning initiatives sponsored by federal and state agencies (e.g. TDEC Recreation Management Plan, State Park planning, State Forest planning, TWRA regional planning, USFWS Joint Venture planning, TVA Reservoir Operations study, etc.)
Information collection and dispersal	Conservation Planning	Develop/participate in regional planning initiatives sponsored by non-governmental organizations or public/private partnerships (e.g. TNC ecoregional planning, WWF watershed planning, Cumberland Region Tomorrow - Community Quality Growth Planning, Partners In Flight, Audubon - Important Bird Areas, Habitat Conservation Plans, etc.).
Information collection and dispersal	Conservation Planning	Develop central database to combine/reconcile/maintain state & federal agency, non-governmental organization, and university sources of data for target species and habitats.
Information collection and dispersal	Formal Education, Training, Outdoor Education, & Recreation	Develop outdoor education and recreation programs that inform the public about the effects of recreational vehicles and various other recreational uses on target species and habitats.

Class	General Action	Specific Action
Information collection and dispersal	Formal Education, Training, Outdoor Education, & Recreation	Incorporate information about protection of target species and habitats into forestry training programs such as the Cooperative Extension Master Logger Program, TN Wildlife Resources Agency Forestry Outreach, and other formal education programs.
Information collection and dispersal	Formal Education, Training, Outdoor Education, & Recreation	Develop brochures, land managers guides, posters, and other educational aids for the public that address conservation issues affecting target species and habitats.
Information collection and dispersal	Formal Education, Training, Outdoor Education, & Recreation	Develop school curricula in conjunction with the TN Department of Education to emphasize local, state, & regional conservation issues affecting target species and habitats.
Information collection and dispersal	Formal Education, Training, Outdoor Education, & Recreation	Deliver formal presentations for classrooms, public-interest groups, academic conferences, clubs, and other groups to promote conservation issues affecting target species and habitats.
Information collection and dispersal	Monitoring	Develop a monitoring program to measure bioaccumulation of contaminants in target species (e.g. fish, mussels, turtles, birds, bats, etc.).
Information collection and dispersal	Monitoring	Expand network of trained volunteers to conduct various types of environmental monitoring for target species and habitats (e.g. "Adopt A Stream" program, PIF bird counts, etc.).
Information collection and dispersal	Monitoring	Develop GIS remote-sensing program to analyze statewide land cover changes, map habitats, evaluate land use practices, etc. at shorter intervals or in greater detail than current national-level programs.
Information collection and dispersal	Research	Conduct scientific surveys to discern the geographical distributions of lesser known target species.
Information collection and dispersal	Research	Conduct research on life history and ecological needs of target species to establish guidelines for determining population viability.
Information collection and dispersal	Research	Establish guidelines for determining population viability standards for target species (i.e. size, condition, & landscape context).
Information collection and dispersal	Research	Conduct research on problems (i.e. stresses and sources of stress) affecting target species and habitats.
Information collection and dispersal	Research	Conduct research to map karst systems, delineate underground watersheds, and identify above-ground linkages to subterranean habitats.
Management and restoration of species and habitats	Compatible Resource Use	Utilize government funded incentive programs (e.g. CRP, EQIP, CSP, WRP, WHIP, FLEP, and LIP) to encourage private landowners to protect water quality for target species in critical units of aquatic, subterranean, or terrestrial habitats.

Class	General Action	Specific Action
Management and restoration of species and habitats	Compatible Resource Use	Utilize government funded incentive programs (e.g. FLEP, WHIP, CRP, EQIP, LIP, Forest Stewardship Program, and Forest Legacy Program) to encourage private landowners to restore and/or protect native forest systems for target species in critical units of aquatic, subterranean, or terrestrial habitats.
Management and restoration of species and habitats	Compatible Resource Use	Utilize government-funded incentive programs such as WHIP, CRP, WRP, GRP, EQIP, CSP, FLEP, LIP, and rare species protection funding such as FWS Section 6 and other funds to manage or restore populations of target species in critical units of aquatic, subterranean, or terrestrial habitats.
Management and restoration of species and habitats	Compatible Resource Use	Develop formal management agreements between private landowners, agencies, and non-governmental organizations to provide financial/technical assistance to manage target species within critical units of aquatic, subterranean, and terrestrial habitats (e.g. TWRA management agreements, USFWS Safe Harbor program, TNC cooperative management agreements, etc.).
Management and restoration of species and habitats	Compatible Resource Use	Install exclusionary devices (e.g. gates, barriers, trespass detection equipment, etc.) to limit access to critical units of aquatic, subterranean, or terrestrial habitats for target species vulnerable to human disturbance.
Management and restoration of species and habitats	Compatible Resource Use	Participate in environmental review procedures to prevent/mitigate construction of dams, impoundments, drainage ditches, levees, stormwater culverts, and other water diversionary structures that affect target species in critical units of aquatic, subterranean, or terrestrial habitats.
Management and restoration of species and habitats	Compatible Resource Use	Participate in environmental review procedures to prevent/mitigate coal mining and oil & natural gas drilling activities that affect target species in critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Compatible Resource Use	Encourage adoption of more stringent sustainable forestry practices on state forests and other public lands that contain critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Conservation Area Management	Participate in activities to establish/adjust state wildlife "sanctuaries" and/or federally designated critical habitat areas for target species on multi-use public/private conservation areas across the state.
Management and restoration of species and habitats	Conservation Area Management	Develop and implement conservation plans for all public/private conservation areas across the state based on ecosystem-level management principles.
Management and restoration of species and habitats	Conservation Area Management	Develop recreation management plans that outline strict guidelines on high-impact recreational uses on public/private conservation areas across the state.
Management and restoration of species and habitats	Conservation Area Management	Discourage conversion of native habitats to semi/non-natural land types (e.g. pine plantations, golf courses, etc.) on public and private conservation areas across the state.

Class	General Action	Specific Action
Management and restoration of species and habitats	Control/Prevention of Invasive Exotic Species & Pathogens	Conduct rapid ecological assessments of key populations of target species and critical units of aquatic, subterranean, and terrestrial habitats most susceptible to invasive exotic species & pathogens.
Management and restoration of species and habitats	Control/Prevention of Invasive Exotic Species & Pathogens	Implement integrated pest management practices to control or prevent invasive exotic species & pathogens from key populations of target species and critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Control/Prevention of Invasive Exotic Species & Pathogens	Organize a TN Exotic Pest Animal Council to coordinate activities with the TN Exotic Pest Plant Council and serve as a clearinghouse of information & decisionmaking to control or prevent outbreaks of invasive exotic species.
Management and restoration of species and habitats	Control/Prevention of Invasive Exotic Species & Pathogens	Establish a central GIS database to track occurrences of severe category invasive exotic species and maintain information on control measures & current management efforts statewide.
Management and restoration of species and habitats	Control/Prevention of Invasive Exotic Species & Pathogens	Support programs that advocate usage of native or non-invasive exotic plants in ornamental horticulture, erosion control, and wildlife habitat plantings.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Reintroduce fire via prescribed burning into fire-dependent grassland & woodland systems within critical units of terrestrial habitats.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Reclaim abandoned coal mines and streams affected by acid mine drainage within critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Restore degraded/converted wetland systems within critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Restore in-stream flows and physical structure to channelized or impounded streams within critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Restore degraded forests and pine plantations to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Restore pastures and other agricultural lands to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Habitat/Natural Processes Restoration	Remove or modify physical barriers that disrupt habitat/population connectivity for target species within critical units of aquatic, subterranean, and terrestrial habitats.
Management and restoration of species and habitats	Species Restoration	Reintroduce extirpated and historic populations of priority species to appropriate habitats across the state.
Management and restoration of species and habitats	Species Restoration	Utilize ex-situ conservation methods (e.g. captive breeding, gene banking, etc.) to conserve populations of target species on the verge of rangewide extinction or local extinction of unique genotypes.
Management and restoration of species and habitats	Species Restoration	Provide funding to permitted institutions/individuals for rehabilitation of priority target species across the state.

Class	General Action	Specific Action
Management and restoration of species and habitats	Species Restoration	Continue funding and staff support for a freshwater mollusc propagation facility to increase populations of mussels and aquatic snails for habitat reintroduction.
Capacity building	Alliances & Partnerships	Develop strategic alliance with Farm Bureau, Natural Resource Conservation Service, Farm Service Agency, TN Division of Water Pollution Control, Cooperative Extension, and other institutions to improve agricultural and animal production industries that affect target species and habitats.
Capacity building	Alliances & Partnerships	Develop strategic alliance with U.S. Army Corp of Engineers, TN Valley Authority, water utility boards, and other institutions to address water management issues that affect target species and habitats.
Capacity building	Alliances & Partnerships	Develop strategic alliance with TN Dept. of Transportation, county mayors, municipalities, city/county planners, private developers and others to address urban and rural development practices that affect target species and habitats.
Capacity building	Alliances & Partnerships	Develop strategic alliance with TN Division of Forestry, TN Forestry Association, U.S. Forest Service, private timber companies, non-governmental organizations, universities, and other forest resource managers to address forestry practices that affect target species and habitats.
Capacity building	Alliances & Partnerships	Develop strategic alliance with TN Division of Geology, Office of Surface Mining, U.S. Geological Survey, TN Oil & Gas Association, private companies, and other institutions to address mining and drilling issues that affect target species and habitats.
Capacity building	Alliances & Partnerships	Develop strategic alliance with the U.S. Environmental Protection Agency, TN Dept. of Environment and Conservation, non-governmental organizations, and other related environmental regulatory agencies to address air and water quality issues affecting target species and habitats.
Capacity building	Alliances & Partnerships	Develop faunal and/or habitat working groups (e.g. bat working group, cave working group, Partners In Flight/TN Ornithological Society working group, etc.) composed of academics, government and non-government biologists, & others to identify research issues, conduct research, fill data gaps, and disperse scientific information.
Capacity building	Alliances & Partnerships	Partner with TN Division of Forestry, TN Wildlife Resources Agency, TN Division of Natural Heritage, TN State Parks, U.S. Forest Service, U.S. Fish & Wildlife Service, The Nature Conservancy, and other institutions to establish a statewide burn crew to conduct prescribed burns in fire-dependent grassland & woodland habitats.

Class	General Action	Specific Action
Capacity building	Alliances & Partnerships	Develop strategic alliances with state/federal agencies, non-governmental organizations, stakeholders, and other groups focused on improvement of regional landscapes or special natural resources that contain target species in need of conservation (e.g. Alliance for the Cumberlands, Mississippi River Corridor, Cumberland Region Tomorrow, cave conservation groups, etc.).
Capacity building	Alliances & Partnerships	Partner with state/federal agencies, non-governmental organizations, and various institutions in other states/countries to develop conservation strategies to manage wide-ranging target species and/or abate problems affecting species and habitats of regional/international concern (e.g. U.S. Fish & Wildlife Service Joint Ventures, international partnerships for neo-tropical migratory birds, Southeast Aquatic Resource Partnership, etc.).
Capacity building	Conservation Finance	Establish a private capital conservation fund to finance and/or provide leverage for priority land acquisition deals across the state.
Capacity building	Conservation Finance	Solicit donations from private individuals and foundations for conservation work being conducted by various state/federal agencies and non-governmental organizations.
Capacity building	Conservation Finance	Incorporate network of trained volunteers within state agencies as "in-kind" services match for federal funds.
Capacity building	Institutional Improvement	Increase staffing and funding of state agencies and local offices of federal agencies responsible for managing target species/habitats or monitoring environmental quality.
Capacity building	Institutional Improvement	Increase staffing and funding of non-governmental organizations that either manage or assist with the protection of target species and habitats.
Capacity building	Institutional Improvement	Create opportunities for cost-shared positions among state agencies, municipal/county governments, non-governmental organizations, and/or other institutions to increase the number of biological staff working on protection of target species and habitats.
Commercial incentives	Conservation Enterprises	Develop forest banking programs for forest systems at high risk of destruction or degradation within critical units of aquatic, subterranean, or terrestrial habitats.
Commercial incentives	Conservation Enterprises	Create ecotourism-based local economies to deter development or natural resource extraction pressures in economically depressed areas that contain critical units of aquatic, subterranean, or terrestrial habitats.
Commercial incentives	Market Forces	Encourage municipal & county governments to subsidize/offer additional incentives to developers that utilize "green" methods of construction, design, and land-use planning in large residential or commercial developments.

Class	General Action	Specific Action
Law & Policy	Compliance & Enforcement	Develop multi-agency network of professional aquatic biologists to assist TN Div. of Water Pollution Control in gathering documentation and supporting evidence to enforce existing water quality laws.
Law & Policy	Compliance & Enforcement	Increase compliance monitoring of aquatic resource alteration permits, storm water, & other permits within critical units of aquatic and subterranean habitats.
Law & Policy	Compliance & Enforcement	Work with TN Wildlife Resources Agency and U.S. Fish & Wildlife Service to enforce compliance with rules and other stipulations for scientific collector permits and commercial licenses.
Law & Policy	Compliance & Enforcement	Provide TWRA wildlife officers with non-game funding to assist with compliance and enforcement of state laws protecting target species and habitats.
Law & Policy	Land-use Planning & Zoning	Participate in the review and/or revision of county urban growth management plans.
Law & Policy	Land-use Planning & Zoning	Encourage municipal and county governments to adopt zoning ordinances that limit or regulate development within critical units of aquatic, subterranean, and terrestrial habitats.
Law & Policy	Land-use Planning & Zoning	Provide funding/resources for the completion of the state's property owner base mapping project for counties that contain critical units of aquatic, subterranean, and terrestrial habitats.
Law & Policy	Legislation	Propose/support state legislation to remove or prevent passage of private legislative acts that negatively effect target species and habitats.
Law & Policy	Legislation	Propose/support state and federal legislation to create dedicated funding sources for conservation programs, acquisition, and/or restoration of critical units of aquatic, subterranean, and terrestrial habitats.
Law & Policy	Legislation	Propose/support state legislation to restrict importation or usage of severe category invasive exotic animal and plant species in the state.
Law & Policy	Legislation	Propose/support state legislation to strengthen penalties for laws regarding poaching, illegal collection, or killing of target species and for violation of current environmental quality or habitat destruction laws.
Law & Policy	Legislation	Propose/support federal legislation to support CITES and to increase penalties for illegal trade in wildlife.
Law & Policy	Legislation	Propose/support state & federal legislation to modify current "greenbelt" laws to include tax breaks to landowners for protection of target species and habitats or vital ecosystem services such as forest/watershed protection.
Law & Policy	Legislation	Propose/support federal legislation to fund a national or regional conservation initiative regarding aquatic resource protection (e.g. National/Southeast Aquatic Resources Partnership).

Class	General Action	Specific Action
Law & Policy	Legislation	Propose/support state legislation urging the federal Office of Surface Mining to designate critical units of aquatic, subterranean, and terrestrial habitats as "lands unsuitable for mining".
Law & Policy	Legislation	Propose/support federal legislation to encourage greater public participation in federal incentive programs (e.g. CRP, EQIP, LIP, WHIP, WRP, etc.) by revamping current spending limits and cost-share matches for private landowners.
Law & Policy	Policies & Regulations	Enact more stringent policies & regulations regarding issuance of scientific collector permits and commercial licenses for target species within critical units of aquatic, subterranean, and terrestrial habitats.
Law & Policy	Policies & Regulations	Review current policies & regulations regarding commercial usage of non-game species.
Law & Policy	Policies & Regulations	Encourage TN Valley Authority and U.S. Army Corps of Engineers to review policies & regulations regarding operation of dams/impoundments or other water diversionary structures that affect target species and habitats.
Law & Policy	Policies & Regulations	Encourage the federal Office of Surface Mining to designate critical units of aquatic, subterranean, and terrestrial habitats as "lands unsuitable for mining" under current federal policy guidelines.
Law & Policy	Standards	Develop standards for instream-flow regimes that establish minimum water levels required for target species during critical periods and for maintenance of habitat quality.
Law & Policy	Standards	Encourage state/federal agencies to increase clean air standards regarding sulfur-dioxide emissions and other pollutants.
Law & Policy	Standards	Develop more stringent standards for forestry "best management practices" based on regional differences in landform and habitats.
Law & Policy	Standards	Evaluate agency standards for conducting environmental reviews of projects that potentially affect target species and habitats.
Law & Policy	Standards	Develop more stringent standards regarding permits for construction projects that potentially affect water quality and/or alter habitat.
Law & Policy	Standards	Evaluate agency standards for reviewing status of state endangered, threatened, proposed endangered, proposed threatened, and "deemed in need of management" species.

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Appendix H - Specific Conservation Actions in the TN-SWAP strategy hierarchy most aligned with TWRA's operational mission, capacity, and funding

Appendix H: Specific Conservation Actions in the TN-SWAP strategy hierarchy most aligned with TWRA's operational mission, capacity, and funding

Class	General Action	Specific Action
Habitat Acquisition	Fee-title Ownership	Use federal/state/private funding sources to acquire critical units of aquatic, subterranean and terrestrial habitats which provide species protection, buffering, connectivity, and/or perpetuation of natural processes.
	Permanent Protective Easements	Use federal/state/private funding sources to acquire permanent easements within critical units of aquatic, subterranean and terrestrial habitats which provide species protection, buffering, connectivity, and/or perpetuation of natural processes.
Information Collection & Dispersal	Communications & Public Relations	Develop a multi-media public outreach campaign to promote the availability of government-funded incentive programs to private landowners.
		Develop a multi-media public outreach campaign to promote awareness of the negative effects of invasive exotic species.
	Conservation Planning	Develop/participate in regional conservation planning initiatives sponsored by federal and state agencies (e.g. TDEC Recreation Management Plan, State Park planning, State Forest planning, TWRA regional planning, USFWS Joint Venture Planning, TVA Reservoir Operations study, etc.).
		Develop/participate in regional planning initiatives sponsored by non-governmental organizations or public/private partnerships (e.g. TNC, WWF, Cumberland Region Tomorrow-Community Quality Growth Planning, Partners in Flight, Audubon-Important Bird Areas, Habitat Conservation Plans, etc.).
	Monitoring	Develop a monitoring program to measure bioaccumulation of contaminants in target species (e.g. fish, mussels, turtles, birds, bats, etc.).
		Expand network of trained volunteers to conduct various types of environmental monitoring for target species and habitats (e.g. Adopt a Stream program, PIF bird counts, etc.).
		Conduct scientific surveys to discern the geographical distributions of lesser known target species.

Appendix H: Specific Conservation Actions in the TN-SWAP strategy hierarchy most aligned with TWRA's operational mission, capacity, and funding

Class	General Action	Specific Action
Information Collection & Dispersal	Research	Conduct research on life history and ecological needs of target species to establish guidelines for determining population viability.
		Conduct research on problems (i.e. stresses and sources of stress) affecting target species and habitats.
Management & Restoration of Species and Habitats	Compatible resource use	Utilize government funded incentive programs to encourage private landowners to protect water quality for target species in critical units of aquatic, subterranean, or terrestrial habitats.
		Utilize government funded incentive programs to encourage private landowners to restore and/or protect native forest systems for target species in critical units of aquatic, subterranean, or terrestrial habitats.
		Install exclusionary devices (e.g. gates, barriers, trespass detection equipment, etc.) to limit access to critical units of aquatic, subterranean, or terrestrial habitats for target species vulnerable to human disturbance.
		Participate in environmental review procedures to prevent/mitigation construction of dams, impoundments, drainage ditches, levees, storm water culverts, and other water diversionary structures that affect target species in critical units of aquatic, subterranean, or terrestrial habitats.
		Participate in environmental review procedures to prevent/mitigate coal mining and oil & natural gas drilling activities that affect target species in critical units of aquatic, subterranean, and terrestrial habitats.
		Encourage adoption of more stringent sustainable forestry practices on state forests and other public lands that contain critical units of aquatic, terrestrial, and subterranean habitats.
	Conservation area management	Develop and implement conservation plans for all public/private conservation areas across the state based on ecosystem-level management principles.
	Control/ Prevention of Invasive Exotic Species & Pathogens	Implement integrated pest management practices to control or prevent invasive exotic species and pathogens from key populations of target specie sand critical units of aquatic, subterranean, and terrestrial habitats.

Appendix H: Specific Conservation Actions in the TN-SWAP strategy hierarchy most aligned with TWRA's operational mission, capacity, and funding

Class	General Action	Specific Action
Management & Restoration of Species and Habitats	Habitat/Natural Processes Restoration	Reintroduce fire via prescribed burning in fire-dependent grassland & woodland systems within critical units of terrestrial habitats.
		Reclaim abandoned coal mines and streams affected by acid mine drainage within critical units of aquatic, subterranean, and terrestrial habitats.
		Restore degraded/converted wetland systems within critical units of aquatic, subterranean, and terrestrial habitats.
		Restore in-stream flows and physical structure to channelized or impounded streams within critical units of aquatic, subterranean, and terrestrial habitats.
		Restore degraded forests and pine plantations to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats
		Restore pastures and other agricultural lands to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.
		Remove or modify physical barriers that disrupt habitat/population connectivity for target species within critical units of aquatic, subterranean and terrestrial habitats.
	Species Restoration	Utilize federal/state funding sources (e.g. USFWS Section 6 Recovery Plan funding, etc.) to reintroduce extirpated and historic populations of priority species to appropriate habitats across the state.
		Continue funding and staffing support for a freshwater mollusk propagation facility to increase populations of mussels and aquatic snails for habitat reintroduction.
Capacity Building	Alliances & Partnerships	Develop strategic alliance with Farm Bureau, Natural Resources Conservation Service, Farm Services Agency, TN Division of Water Resources, Cooperative Extension, and other institutions to improve agricultural and animal production industries that affect target species and habitats.
		Develop strategic alliance with U.S. Army Corps of Engineers, TN Valley Authority, water utility boards, and other institutions to address water management issues that affect target species and habitats.

Appendix H: Specific Conservation Actions in the TN-SWAP strategy hierarchy most aligned with TWRA's operational mission, capacity, and funding

Class	General Action	Specific Action
Capacity Building	Alliances & Partnerships	Develop faunal and/or habitat working groups (e.g. bat working group, cave working group, Partners in Flight/ TN Ornithological Society working group, etc.) composed of academics, government and non-government biologists, & others to identify research issues, conduct research, fill data gaps, and disperse scientific information.
Law & Policy	Compliance & Enforcement	Develop multi-agency network of professional aquatic biologists to assist TN Division of Water Resources in gathering documentation and supporting evidence to enforce existing water quality laws.
	Land-use Planning & Zoning	Participate in the review and/or revision of county urban growth management plans.
		Encourage municipal and county governments to adopt zoning ordinances that limit or regulate development within critical units of aquatic, subterranean, and terrestrial habitats.
	Policies & Regulations	Encourage TN Valley Authority and U.S. Army Corps of Engineers to review policies and regulations regarding operation of dams/impoundments or other water diversionary structures that affect target species and habitats.
		Encourage the Federal Office of Surface Mining to designate critical units of aquatic, subterranean, and terrestrial habitats as "lands unsuitable for mining" under current federal policy guidelines.
	Standards	Develop standards for instream flow regimes that establish water levels required for target species during critical periods and for maintenance of habitat quality.
		Develop more stringent standards for forestry "best management practices" based on regional differences in landform and habitats.

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Appendix I - Conservation Opportunity Area summary factsheets

(this document is bound separately)

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Appendix J - Preliminary adaptation options for different sets of priority species and habitats

Appendix J: Preliminary adaptation options for different sets of priority species and habitats

Preliminary adaptation options for different sets of priority species and habitats, related to shifting precipitation and warming temperatures at landscape and local scales in Tennessee.

Note: Adaptation options are organized according to **National Fish, Wildlife and Plants Climate Adaptation Strategy** (NFWPCAS) goal and National Wildlife Federation's (NWF) general adaptation strategy classification. Information in the following tables should be considered preliminary and not inclusive of all climate related conservation needs in Tennessee. For further explanation, please see Chapter 5 of the SWAP report.

Changes in precipitation timing and duration

I. Maintain and improve hydrologic integrity of aquatic systems to support GCN species populations and habitats		
NFWPCAS Goal Number	**NWF General Adaptation Strategy**	**TN Adaptation Option**
1	Protect key ecosystem features	Manage instream flows to mimic ecologically relevant portions of the hydrograph. Evaluate flow management alternatives to abate shifts in seasonal timing and duration of precipitation.
1	Protect key ecosystem features	Identify and protect headwater sections of priority watersheds to improve adaptive capacity of overall stream network.
1	Restore structure and function	Encourage expansion of riparian buffers and the restoration of floodplain areas to ameliorate effects of extreme precipitation events, including reducing erosion and excess sedimentation.
1	Restore structure and function	Invest in riparian and isolated wetlands restoration to provide water storage, base flow augmentation, and habitat.
1	Restore structure and function	When appropriate, install physical structures to engineer functional stream design and/or stabilize key habitat features.
1	Restore structure and function	Utilize management techniques that maintain or re-connect floodplain spawning habitat in changing precipitation regimes.
1	Ensure connectivity	Restore longitudinal connectivity within river systems wherever feasible to improve the adaptive capacity of systems to shifting precipitation regimes and facilitate natural migrations of species to new habitats.
2	Relocate organisms	When appropriate, facilitate species movement to new habitat locations.

Appendix J: Preliminary adaptation options for different sets of priority species and habitats

I. Maintain and improve hydrologic integrity of aquatic systems to support GCN species populations and habitats		
NFWPCAS Goal Number	**NWF General Adaptation Strategy**	**TN Adaptation Option**
7	Reduc e non-climate stressors	Mitigate the impacts of flow regime changes from existing impervious surfaces and manage development of future impervious surfaces to reduce increased run-off in high precipitation events and the negative impacts to base flow conditions.
7	Reduce non-climate stressors	Utilize advance planning and collaborations to prevent negative impacts from drinking water, agricultural, and industrial withdrawals on ecologically important components of stream and river hydrographs, particularly low flow and extreme low flow events related to drought.
7	Reduce non-climate stressors	Reduce development footprints in floodplains, and consider where floodplain expansions may occur to reduce vulnerabilities and protect against increased magnitude and frequency of flood events.
7	Reduce non-climate stressors	Address potential issues with current infrastructure capacities for managing more frequent and intense precipitation, including large dam facilities, municipal stormwater and wastewater management systems.
7	Reduce non-climate stressors	Address potential conflicts with flow-related pollutant discharges (e.g., municipal and industrial wastewater NPDES permit allocations) and changes to river and stream assimilative capacities.

Appendix J: Preliminary adaptation options for different sets of priority species and habitats

II. Maintain and improve suitable breeding habitat for migratory birds in Tennessee in collaboration with regional partners across their range		
NFWPCAS Goal Number	**NWF General Adaptation Strategy**	**TN Adaptation Option**
1	Restore structure and function	Encourage expansion of riparian buffers and the restoration of floodplain areas to improve availability of breeding habitats and food resources.
1	Restore structure and function	Evaluate potential for reservoir draw-down management timing to improve habitat for migratory shorebirds.

III. Maintain and increase, as appropriate, the quality and abundance of amphibian breeding habitats		
NFWPCAS Goal Number	**NWF General Adaptation Strategy**	**TN Adaptation Option**
1	Protect key ecosystem features	Ensure key wetland habitats have proper forest vegetation cover to buffer against over-drying or untimely drying of breeding habitats.
1	Protect key ecosystem features	Conduct research to identify critical shifts in habitat suitability that may be influenced by precipitation timing & duration changes.
1	Restore structure and function	Evaluate potential for appropriately designed and sited artificial breeding habitats for appropriate species, including considerations of local spatial heterogeneity and species-specific habitat needs.
1	Restore structure and function	Develop monitoring designs to address knowledge gaps in habitat usage and inform adaptive management practices, particularly for 3 to 4 species which utilize sphagnum moss.
2	Support evolutionary potential	Improve understanding of amphibian species adaptive capacity across their ranges to better inform potential conservation actions. Identify species with greater/lesser adaptive capacity in different geographic settings, including how seeps and springs may serve as refugia.

IV. Protect and maintain, where feasible, cold water stream habitat in support of eastern brook trout populations		
NFWPCAS Goal Number	**NWF General Adaptation Strategy**	**TN Adaptation Option**
1	Protect refugia	Protect & manage current and anticipated thermal refugia, primarily on state and federal public lands.
1	Protect key ecosystem features	Protect natural flow regimes in priority habitats.
1	Ensure connectivity	Evaluate, improve, and maintain latitudinal connectivity in brook trout streams to facilitate natural migration of individuals over time.
7	Reduce non-climate stressors	Execute monitoring to evaluate the potential competitive advantage gained by other trout as water temperatures warm.
7	Reduce non-climate stressors	Execute monitoring to evaluate whether pathogen impacts worsen as water temperatures warm.

Appendix J: Preliminary adaptation options for different sets of priority species and habitats

V. Conserve high elevation (>6000 ft) sites and monitor for potential forest type transition, managing for structure, function, and species migration changes as feasible.		
NFWPCAS Goal Number	**NWF General Adaptation Strategy**	**TN Adaptation Option**
2	Support evolutionary potential	Conduct research and monitoring programs to address the following types of questions: • Develop working hypotheses of potential forest habitat transition states under warming temperatures. • Monitor change in forest community in the field to assess if/how transitions are occurring. • Use monitoring information to inform management decisions to facilitate transition or invest in persistence strategies.
2	Support evolutionary potential	Establish monitoring programs for priority species such as northern flying squirrel, rock vole, and GCN salamander species to track changes in population status and distributions.
2	Support evolutionary potential	Maintain genotypes and restore populations of high value species such as red spruce (*Picea rubens).*
7	Reduce non-climate stressors	Control negative impacts of invasive species such as wild hogs and non-native plants which damage habitat, disrupt seedbanks, and reduce the overall adaptive capacity of the native forest system.

Appendix J: Preliminary adaptation options for different sets of priority species and habitats

VI. Maintain stable populations of GCN species experiencing pathogen outbreaks through protection and management of diverse habitats, monitoring and treating pathogen impacts			
NFWPCAS Goal Number	**Faunal group or Habitat type**	**NWF General Adaptation Strategy**	**TN Adaptation Option**
1	Amphibians & reptiles	Protect key ecosystem features	Ensure key wetland & riparian habitats have proper forest vegetation cover to buffer against reductions in overall habitat.
1	Amphibians & reptiles	Protect refugia	Evaluate potential for protecting discrete populations of species across their geographic ranges in locations with higher local resilience attributes.
7	Amphibians & reptiles	Reduce non-climate stressors	Conduct research to address outstanding knowledge gaps, including: • Do infections advance when the animal is thermally or under stressful moisture conditions? • Are there management actions which may be effective to abate stress and reduce infection severity? • How will the spread and intensity of disease outbreaks change in different temperature and precipitation conditions?
7	Amphibians & reptiles	Reduce non-climate stressors	Monitor populations for disease presence and severity, and tract for presence of emerging pathogens.
7	Amphibians & reptiles	Reduce non-climate stressors	Support efforts to regulate introduction of pathogens through domestic and international pet trades.
1	Forest habitats & target tree species	Protect refugia	Identify and manage refugia for species as appropriate (i.e. Tennessee Hemlock Conservation Plan).
7	Forest habitats & target tree species	Reduce non-climate stressors	Conduct research and monitoring efforts to address questions such as the following: • What will be the interaction of pest/ pathogen spread and changing temperature conditions? • What are the landscape-scale effects of pest/pathogen spread on forest types and structure? • What may be the effects of the matrix landscape around infection areas in terms of survival rates? • What pest/pathogen management techniques may be successful in reducing negative impacts?

Appendix J: Preliminary adaptation options for different sets of priority species and habitats

VI. Maintain stable populations of GCN species experiencing pathogen outbreaks through protection and management of diverse habitats, monitoring and treating pathogen impacts			
NFWPCAS Goal Number	**Faunal group or Habitat type**	**NWF General Adaptation Strategy**	**TN Adaptation Option**
1	Cave hibernating bats	Protect key ecosystem features	Protect forested habitats and buffers around known hibernacula to abate potential influences of warming ambient air temperatures on internal cave temperature dynamics.
7	Cave hibernating bats	Reduce non-climate stressors	Conduct research to address outstanding knowledge gaps, including: • Increasing our understanding of bat behavioral responses when they break hibernation because of infection • Is the use of current hibernacula on the decline – are bats moving to new locations? • What are the effects of ambient air temperature increases on *Pseudogymnoascus destructans* when bats are not hibernating?

Tennessee State Wildlife Action Plan 2015

Appendix K - Crosswalk of the TN-SWAP Specific Conservation Actions to the USFWS TRACS Reporting System Category (Level 1) and Strategy (Level 2) hierarchy

Appendix K: Crosswalk of the TN-SWAP Specific Conservation Actions to the **USFWS TRACS Reporting System** Category (Level 1) and Strategy (Level 2) hierarchy.

TRACS Cat (L1)	TRACS Strategy (L2)	TRACS Unit	TN-SWAP Specific Conservation Action
Coordination and administration	Incentives	number	Utilize government funded incentive programs to encourage private landowners to restore and/or protect native forest systems for target species in critical units of aquatic, subterranean, or terrestrial habitats.
		number	Utilize government funded incentive programs to encourage private landowners to protect water quality for target species in critical units of aquatic, subterranean, or terrestrial habitats.
Direct management of natural resources	Create new habitat or natural processes	acres	Restore pastures and other agricultural lands to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.
		acres	Restore degraded/converted wetland systems within critical units of aquatic, subterranean, and terrestrial habitats.
	Dam & barrier removal	structures	Remove or modify physical barriers that disrupt habitat/population connectivity for target species within critical units of aquatic, subterranean and terrestrial habitats.
	Fire management	acres	Reintroduce fire via prescribed burning in fire-dependent grassland & woodland systems within critical units of terrestrial habitats.
	Hazard or infrastructure removal	acres	Reclaim abandoned coal mines and streams affected by acid mine drainage within critical units of aquatic, subterranean, and terrestrial habitats.
	Instream modification	miles	Restore in-stream flows and physical structure to channelized or impounded streams within critical units of aquatic, subterranean, and terrestrial habitats.
	Invasive species control	acres	Implement integrated pest management practices to control or prevent invasive exotic species and pathogens from key populations of target specie sand critical units of aquatic, subterranean, and terrestrial habitats.

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TRACS Cat (L1)	TRACS Strategy (L2)	TRACS Unit	TN-SWAP Specific Conservation Action
	Vegetation management	acres	Restore degraded forests and pine plantations to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.
	Wildlife damage management	interventions	Install exclusionary devices (e.g. gates, barriers, trespass detection equipment, etc.) to limit access to critical units of aquatic, subterranean, or terrestrial habitats for target species vulnerable to human disturbance.
Data collection and analysis	Research, survey or monitoring - fish and wildlife populations	projects	Conduct scientific surveys to discern the geographical distributions of lesser known target species.
		projects	Conduct research on life history and ecological needs of target species to establish guidelines for determining population viability.
		projects	Develop a monitoring program to measure bioaccumulation of contaminants in target species (e.g. fish, mussels, turtles, birds, bats, etc).
	Research, survey or monitoring - habitat	projects	Conduct research on problems (i.e. stresses and sources of stress) affecting target species and habitats.
Land & water rights acquisition	Land acquisition	acres	Use federal/state/private funding sources to acquire critical units of aquatic, subterranean and terrestrial habitats which provide species protection, buffering, connectivity, and/or perpetuation of natural processes.
		acres	Use federal/state/private funding sources to acquire permanent easements within critical units of aquatic, subterranean and terrestrial habitats which provide species protection, buffering, connectivity, and/or perpetuation of natural processes.
Outreach	Partner/stakeholder engagement	number	Develop strategic alliance with Farm Bureau, Natural Resources Conservation Service, Farm Services Agency, TN Division of Water Resources, Cooperative Extension, and other institutions to improve agricultural and animal production industries that affect target species and habitats.

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TRACS Cat (L1)	TRACS Strategy (L2)	TRACS Unit	TN-SWAP Specific Conservation Action
		number	Develop a multi-media public outreach campaign to promote the availability of government-funded incentive programs to private landowners.
		number	Develop strategic alliance with U.S. Army Corps of Engineers, TN Valley Authority, water utility boards, and other institutions to address water management issues that affect target species and habitats.
		number	Develop faunal and/or habitat working groups (e.g. bat working group, cave working group, Partners in Flight/TN Ornithological Society working group, etc.) composed of academics, government and non-government biologists, & others to identify research issues, conduct research, fill data gaps, and disperse scientific information.
		number	Develop multi-agency network of professional aquatic biologists to assist TN Division of Water Resources in gathering documentation and supporting evidence to enforce existing water quality laws.
		number	Develop standards for instream flow regimes that establish water levels required for target species during critical periods and for maintenance of habitat quality.
		number	Develop a multi-media public outreach campaign to promote awareness of the negative effects of invasive exotic species.
Planning	Land use planning	plans	Participate in the review and/or revision of county urban growth management plans.
		plans	Encourage municipal and county governments to adopt zoning ordinances that limit or regulate development within critical units of aquatic, subterranean, and terrestrial habitats.
	Organizational strategic & CMS planning	plans	Develop/participate in regional conservation planning initiatives sponsored by federal and state agencies (e.g. TDEC Recreation Management Plan, State Park planning, State Forest planning, TWRA regional planning, USFWS Joint Venture Planning, TVA Reservoir Operations study, etc.).

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TRACS Cat (L1)	TRACS Strategy (L2)	TRACS Unit	TN-SWAP Specific Conservation Action
		plans	Develop/participate in regional planning initiatives sponsored by non-governmental organizations or public/private partnerships (e.g. TNC ecoregional planning, WWF watershed planning, Cumberland Region Tomorrow-Community Quality Growth Planning, Partners in Flight, Audubon-Important Bird Areas, Habitat Conservation Plans, etc.).
		plans	Develop and implement conservation plans for all public/private conservation areas across the state based on ecosystem-level management principles.
	Species and habitat management planning	plans	Develop/participate in regional conservation planning initiatives sponsored by federal and state agencies (e.g. TDEC Recreation Management Plan, State Park planning, State Forest planning, TWRA regional planning, USFWS Joint Venture Planning, TVA Reservoir Operations study, etc.).
		plans	Develop/participate in regional planning initiatives sponsored by non-governmental organizations or public/private partnerships (e.g. TNC ecoregional planning, WWF watershed planning, Cumberland Region Tomorrow-Community Quality Growth Planning, Partners in Flight, Audubon-Important Bird Areas, Habitat Conservation Plans, etc.).
Species re-introduction and stocking	Native species restoration	animals	Continue funding and staffing support for a freshwater mollusc propagation facility to increase populations of mussels and aquatic snails for habitat reintroduction.
		animals	Utilize federal/state funding sources (e.g. USFWS Section 6 Recovery Plan funding, etc.) to reintroduce extirpated and historic populations of priority species to appropriate habitats across the state.
Technical assistance	Environmental review	reviews	Encourage TN Valley Authority and U.S. Army Corps of Engineers to review policies and regulations regarding operation of dams/ impoundments or other water diversionary structures that affect target species and habitats.

Appendix K: Crosswalk of the TN-SWAP Specific Conservation Actions to the **USFWS TRACS Reporting System** Category (Level 1) and Strategy (Level 2) hierarchy.

TRACS Cat (L1)	TRACS Strategy (L2)	TRACS Unit	TN-SWAP Specific Conservation Action
		reviews	Participate in environmental review procedures to prevent/mitigation construction of dams, impoundments, drainage ditches, levees, storm water culverts, and other water diversionary structures that affect target species in critical units of aquatic, subterranean, or terrestrial habitats.
		reviews	Participate in environmental review procedures to prevent/mitigate coal mining and oil & natural gas drilling activities that affect target species in critical units of aquatic, subterranean, and terrestrial habitats.
		reviews	Encourage the Federal Office of Surface Mining to designate critical units of aquatic, subterranean, and terrestrial habitats as “lands unsuitable for mining” under current federal policy guidelines.
	Technical assistance	assists	Develop more stringent standards for forestry "best management practices" based on regional differences in landform and habitats.
		assists	Encourage adoption of more stringent sustainable forestry practices on state forests and other public lands that contain critical units of aquatic, terrestrial, and subterranean habitats.
		assists	Expand network of trained volunteers to conduct various types of environmental monitoring for target species and habitats (e.g. Adopt a Stream program, PIF bird counts, etc.).
		plans	Develop and implement conservation plans for all public/private conservation areas across the state based on ecosystem-level management principles.