

Tennessee 2025 State Wildlife Action Plan

Appendix H

Comprehensive Hierarchy of State Conservation Actions

2025 TN SWAP Comprehensive Hierarchy of Statewide Conservation Actions for SGCN

Action Class (#)	General Action (ABC)	Specific Action	Metric
1. Habitat acquisition	A. Fee-title Ownership	1. 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.	# of acres
		2. Coordinate land acquisition priorities among state/federal agencies and non-governmental organizations.	N/A
	B. Permanent Protective Easements	1. 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.	# of caves protected
		2. Coordinate acquisition of permanent protective easements among state/federal agencies and non-governmental organizations.	# of acres restored
	A. Communications & Public Relations	1. Develop a multi-media public outreach campaign to promote the availability of government-funded incentive programs to private landowners.	# of acres restored
		2. Develop a multi-media public outreach campaign to promote awareness of the negative effects of invasive exotic species.	# of acres
		3. Develop a multi-media public outreach campaign to promote the need for conserving rare, threatened, or endangered species and habitats.	# of people reached or # of outreach events held
	B. Conservation Planning	1. Develop/participate in regional conservation planning initiatives sponsored by federal and state agencies (e.g., TDEC Outdoor Recreational Planning, Tennessee State Park Comprehensive System Planning and park-specific Strategic Management Planning, Tennessee State Forest planning, TWRA regional planning, USFWS Joint Venture planning, TVA Reservoir Operations Planning, USACE Water Control Manual updates and revisions, etc.)	# of initiatives participated in
		2. 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.).	# of initiatives participated in
		3. Develop central database to combine/reconcile/maintain state & federal agency, non-governmental organization, and university sources of data for target species and habitats.	# of surveys
		1. 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.	# of research projects

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2. Information collection and dispersal	C. Formal Education, Training, Outdoor Education, & Recreation	2. 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.	# of programs to have incorporated info.
		3. Develop brochures, guides, posters, and other educational aids for land managers and for the public that address conservation issues affecting target species and habitats.	# of acres
		4. Develop school curricula in conjunction with the TN Department of Education to emphasize local, state, & regional conservation issues affecting target species and habitats.	# of acres restored
		5. Deliver formal presentations for classrooms, public-interest groups, academic conferences, clubs, and other groups to promote conservation issues affecting target species and habitats.	# of acres restored or # of feet or riparian area restored
	D. Monitoring	1. Develop a monitoring program to measure bioaccumulation of contaminants in target species (e.g., fish, mussels, turtles, birds, bats, etc.).	# of working groups established or maintained
		2. 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.).	# of species or # of volunteers trained
		3. 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.	# of acres
	E. Research	1. Conduct scientific surveys to discern the geographical distributions of lesser known target species.	# of surveys
		2. Conduct research on life history and ecological needs of target species to establish guidelines for determining population viability.	# of projects
		3. Establish guidelines for determining population viability standards for target species (i.e., size, condition, & landscape context).	# of species
		4. Conduct research on problems (i.e., stresses and sources of stress) affecting target species and habitats.	# of projects
		5. Conduct research to map karst systems, delineate underground watersheds, and identify above-ground linkages to subterranean habitats.	# of maps produced, delineations performed, linkages made

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	A. Compatible Resource Use	1. Utilize government funded incentive programs (e.g., CRP, EQIP, CSP, WRP, and FLEP) to encourage private landowners to protect water quality for target species in critical units of aquatic, subterranean, or terrestrial habitats.	# of acres restored
		2. Utilize government funded incentive programs (e.g., FLEP, CRP, EQIP, 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.	# of acres restored
		3. Utilize government-funded incentive programs such as 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.	# of species targeted
		4. 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., USFWS Safe Harbor program, TNC cooperative management agreements, etc.).	# of agreements
		5. 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.	# of exclusionary devices constructed
		6. 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.	# of reviews performed
		7. 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.	# of reviews performed
		8. 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.	# of reviews performed
	B. Conservation Area Management	1. 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.	# of acres
		2. Develop and implement conservation plans for all public/private conservation areas across the state based on ecosystem-level management principles.	# of conservation plans developed
		3. Develop recreation management plans that outline strict guidelines on high-impact recreational uses on public/private conservation areas across the state.	# of recreation plans developed

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3. Management and restoration of species and habitats		4. 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.	# of acres
	C. Control/ Prevention of Invasive Exotic Species & Pathogens	1. 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.	# of assessments performed
		2. 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.	# IPMs implemented
		3. 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.	# of meetings
		4. Establish a central GIS database to track occurrences of severe category invasive exotic species and maintain information on control measures & current management efforts statewide.	# of species tracked
		5. Support programs that advocate usage of native or non-invasive exotic plants in ornamental horticulture, erosion control, and wildlife habitat plantings.	# of acres
	D. Habitat/Natural Processes Restoration	1. Reintroduce fire via prescribed burning into fire-dependent grassland & woodland systems within critical units of terrestrial habitats.	# of acres burned
		2. Reclaim abandoned coal mines and streams affected by acid mine drainage within critical units of aquatic, subterranean, and terrestrial habitats.	# of acres reclaimed
		3. Restore degraded/converted wetland systems within critical units of aquatic, subterranean, and terrestrial habitats.	# of acres restored
		4. Restore in-stream flows and physical structure to channelized or impounded streams within critical units of aquatic, subterranean, and terrestrial habitats.	# of acres or linear feet restored
		5. Restore degraded forests and pine plantations to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.	# of acres restored
		6. Restore pastures and other agricultural lands to appropriate natural ecological systems in or near critical units of aquatic, subterranean, and terrestrial habitats.	# of acres restored
		7. Remove or modify physical barriers that disrupt habitat/population connectivity for target species within critical units of aquatic, subterranean, and terrestrial habitats.	# of acres or linear feet restored

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	E. Species Restoration	1. Reintroduce extirpated and historic populations of priority species to appropriate habitats across the state.	# of introductions
		2. Utilize ex-situ conservation methods (e.g., captive breeding, gene banking, etc.) to conserve populations of target species on the verge of range-wide extinction or local extinction of unique genotypes.	# of programs implemented
		3. Provide funding to permitted institutions/individuals for rehabilitation of priority target species across the state.	# of species
		4. Continue funding and staff support for a freshwater mollusk propagation facility to increase populations of mussels and aquatic snails for habitat reintroduction.	# of species
	A. Alliances & Partnerships	1. Develop strategic alliance with Farm Bureau, Natural Resource Conservation Service, Farm Service Agency, TN Division of Water Pollution Control, TN Dept. of Agriculture, Cooperative Extension, and other institutions to improve agricultural and animal production industries that affect target species and habitats.	# of partnerships
		2. Develop strategic alliance with US Army Corp of Engineers, TN Valley Authority, water utility boards, and other institutions to address water management issues that affect target species and habitats.	# of partnerships
		3. 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.	# of partnerships
		4. Develop strategic alliance with TN Division of Forestry, TN Forestry Association, US Forest Service, private timber companies, non-governmental organizations, universities, and other forest resource managers to address forestry practices that affect target species and habitats.	# of partnerships
		5. Develop strategic alliance with TN Division of Geology, Office of Surface Mining, US Geological Survey, TN Oil & Gas Association, private companies, and other institutions to address mining and drilling issues that affect target species and habitats.	# of partnerships
		6. Develop strategic alliance with the US 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.	# of partnerships
		7. Develop faunal and/or habitat working groups or continue working groups previously established (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.	# of working groups established or maintained

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4. Capacity building		8. Partner with TN Division of Forestry, TN Wildlife Resources Agency, TN Division of Natural Heritage, TN State Parks, US Forest Service, US 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.	# of acres burned
		9. 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 Critical Area Program, Cumberland Region Tomorrow, cave conservation groups, etc.).	# of acres
		10. 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., US Fish & Wildlife Service Joint Ventures, international partnerships for neo-tropical migratory birds, Southeast Aquatic Resource Partnership, etc.).	# of acres
	B. Conservation Finance	1. Establish a private capital conservation fund to finance and/or provide leverage for priority land acquisition deals across the state.	# of acres
		2. Solicit donations from private individuals and foundations for conservation work being conducted by various state/federal agencies and non-governmental organizations.	# of acres
		3. Incorporate network of trained volunteers within state agencies as "in-kind" services match for federal funds.	# of volunteers
	C. Institutional Improvement	1. Increase staffing and funding of state agencies and local offices of federal agencies responsible for managing target species/habitats or monitoring environmental quality.	# of acres or species
		2. Increase staffing and funding of non-governmental organizations that either manage or assist with the protection of target species and habitats.	# of acres or species
		3. 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.	# of acres or species
5. Commercial incentives	A. Conservation Enterprises	1. Develop forest banking programs for forest systems at high risk of destruction or degradation within critical units of aquatic, subterranean, or terrestrial habitats.	# of acres
		2. 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.	# of acres
	B. Market Forces	1. 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.	# of acres

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6. Law & Policy	A. Compliance & Enforcement	1. 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.	# of acres
		2. Increase compliance monitoring of aquatic resource alteration permits, storm water, & other permits within critical units of aquatic and subterranean habitats.	# of acres
		3. Work with TN Wildlife Resources Agency and US Fish & Wildlife Service to enforce compliance with rules and other stipulations for scientific collection permits and commercial licenses.	# of species
		4. Provide TWRA wildlife officers with non-game funding to assist with compliance and enforcement of state laws protecting target species and habitats.	# of species or # of acres
	B. Land-use Planning & Zoning	1. Participate in the review and/or revision of county urban growth management plans.	# of plans
		2. Encourage municipal and county governments to adopt zoning ordinances that limit or regulate development within critical units of aquatic, subterranean, and terrestrial habitats.	# of acres
		3. 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.	# of acres
	C. Legislation	1. Propose/support state legislation to remove or prevent passage of private legislative acts that negatively affect target species and habitats.	# of species or # of acres
		2. 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.	# of species or # of acres
		3. Propose/support state legislation to restrict importation or usage of severe category invasive exotic animal and plant species in the state.	# of species or # of acres
		4. 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.	# of species or # of acres
		5. Propose/support federal legislation to support CITES and to increase penalties for illegal trade in wildlife.	# of species
		6. 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.	# of species or # of acres
		7. Propose/support federal legislation to fund a national or regional conservation initiative regarding aquatic resource protection (e.g., National/Southeast Aquatic Resources Partnership).	# of species or # of acres
		8. 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".	# of species or # of acres

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		9. Propose/support federal legislation to encourage greater public participation in federal incentive programs (e.g., CRP, EQIP, WHIP, WRP, etc.) by revamping current spending limits and cost-share matches for private landowners.	# of species or # of acres
	D. Policies & Regulations	1. Enact more stringent policies & regulations regarding issuance of scientific collection permits and commercial licenses for target species within critical units of aquatic, subterranean, and terrestrial habitats.	# of species or # of acres
		2. Review current policies & regulations regarding commercial usage of non-game species.	# of species
		3. Encourage TN Valley Authority and US Army Corps of Engineers to review policies & regulations regarding operation of dams/ impoundments or other water diversionary structures that affect target species and habitats.	# of acres
		4. 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.	# of acres
	E. Standards	1. Develop standards for instream-flow regimes that establish minimum water levels required for target species during critical periods and for maintenance of habitat quality.	# of acres
		2. Develop more stringent standards for forestry "best management practices" based on regional differences in landform and habitats.	# of acres
		3. Evaluate agency standards for conducting environmental reviews of projects that potentially affect target species and habitats.	# of species or # of acres
		4. Develop more stringent standards regarding permits for construction projects that potentially affect water quality and/or alter habitat.	# of species or # of acres
		5. Evaluate agency standards for reviewing status of state endangered, threatened, proposed endangered, proposed threatened, and "deemed in need of management" species.	# of species
	A. Research	1. Identify species with specialized habitat, resource, or connectivity needs across their life stages (i.e., those that are area-limited, resource-limited, dispersal-limited, or process-limited).	# of species
		2. Map the distribution of species that are being displaced by changes in climate, and model future suitable habitat under different climate and land-use scenarios and over different periods of time (e.g., 2050, 2100).	# of species
		3. Assess threats to species (or vulnerabilities of species) using a suite of plausible future climate and land-use change scenarios.	# of threats
	B. Adaptation Planning	1. Identify areas in locations within the existing geographic range of species for restoration or protection that are unoccupied due to geographic barriers or past catastrophes but are climatically suitable for persistence into the future.	# of acres
		2. Assess risks and vulnerability of conservation targets to inform monitoring and adaptation priorities.	# of species

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7. Climate Adaptation		3. Monitor the status of pre-defined indicators of ecosystem integrity and function and adjust management approaches if needed in response to indicator status.	# of acres
		4. Proactively monitor range-shifting species and pathogens to minimize introductions or outbreaks that may have undesirable or negative impacts.	# of species
	C. Habitat Acquisition	1. Protect land and water across environmental gradients to support viable SGCN populations, allow for migration, and maximize opportunities for unassisted evolutionary adaptation to future	# of acres
		2. Identify and protect areas important to maintain biodiversity and ecosystem functions, such as climate refugia, current biodiversity hotspots, large intact habitats, aquatic and riparian systems, and corridors for connectivity.	# of acres
		3. Identify and protect areas with high evolutionary potential (i.e., evolutionary or biodiversity hotspots) that allow for the persistence of locally adapted populations and adaptive genetic diversity.	# of acres
		4. Conserve areas that provide high quality habitats under current climate conditions and are likely to be resilient to climate change or support a broad array of species in the future.	# of acres
		5. Implement market-based incentives (such as carbon markets) where appropriate that encourage conservation and restoration of ecosystems for the full range of ecosystem services including carbon storage.	# of acres
	D. Conservation Area Management	1. Identify and pursue opportunities to increase conservation of priority lands and waters by working with managers of existing public lands managed for purposes other than conservation, such as military installations or state lands.	# of acres
		2. Make available diverse conditions, resources, or habitat types that allow for individuals or populations to utilize a range of resources more effectively.	# of acres
	E. Habitat/Natural Processes Restoration	1. Develop and implement restoration protocols and techniques that promote ecosystem resilience and facilitate adaptation under a range of plausible future conditions.	# of acres
		2. Restore degraded habitats, as appropriate, to support a diversity of species assemblages and ecosystem structure and function.	# of acres
		3. Restore or enhance areas that will provide essential habitat and ecosystem services during ecosystem transformation under a changing climate.	# of acres
		4. Redesign and remove existing structures or barriers where there is the greatest potential to restore natural processes.	# of acres
		5. Enhance design and siting criteria for water resources infrastructure to reduce impacts and restore connectivity in floodplains and aquatic habitats, in partnership with water resource managers.	# of acres

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		6. Restore and enhance riparian zones and buffers in agricultural and urban areas to minimize non-point source pollution.	# of acres restored or # of feet or riparian area restored
		7. Use native plants for restoration where possible, and here native plant sourcing is not possible, use resilient and non-invasive species and seed mixes.	# of acres
		8. Reduce existing sources of pollution and contaminants and increase monitoring of air and water pollution as necessary.	# of acres
		9. Reduce ground and surface water withdrawals in areas experiencing drought.	# of gallons reduced
	F. Climate Adaptation Management	1. Protect and restore riparian buffers to reduce temperature and moderate flows in riparian systems.	# of acres restored or # of feet or riparian area restored
		2. Protect wetland systems to buffer storm and flood impacts.	# of acres
		3. Re-establish fire regimes with prescribed burning to reduce the risk of catastrophic wildfire.	# of acres
		Increase the number of viable populations (redundancy) for species most at risk of extinction due to stochastic events (especially those with extremely limited ranges).	# of populations
		4. Maintain size, age structure, and genetic diversity of managed populations and aim for large and viable population sizes	# of population
		5. Provide alternative resources (e.g., multiple milkweed species for monarchs) for species with fixed reproductive timing or cues and minimize phenological mismatches.	# of acres
		6. Reduce risks of facilitating movement of undesirable invasive species, pests, and pathogens, while allowing for connectivity for the movement of desired species.	# of species
		7. Reduce harmful invasive species to the greatest extent possible, by applying integrated management practices, sharing innovative control methodologies, and taking corrective actions when necessary.	# of species
	G. Facilitation	1. Restore connectivity pathways to areas beyond species' current distribution, such as at the leading edge of the species' range, that will likely be climatically suitable in the future, to facilitate movement and tracking of suitable climatic conditions.	# of acres
		2. Conduct strategic translocations (aka: assisted migration, managed relocation, conservation translocation) to sites that span a range of potentially suitable climatic or hydrological conditions either within or beyond current distributions, after evaluating risks, weighing ethical considerations, and managing for unintended consequences.	# of translocations
		3. Manage species to preserve genetic diversity, especially at the leading and trailing edges of their ranges.	# of species