

**SOUTHEAST
BEAVER ALLIANCE**



September 4, 2025

Via E-mail to smithah@dnr.sc.gov

Anna Huckabee Smith, SWAP/SWG Coordinator
South Carolina Department of Natural Resources
P. O. Box 167
Columbia, SC 29202-0167

Re: Draft 2025 State Wildlife Action Plan

Dear Ms. Smith,

The Southeast Beaver Alliance, a collaborative group made up of environmental professionals, submits these comments regarding the draft of South Carolina's revised State Wildlife Action Plan ("SWAP"). We are pleased to offer our general support for the plan, as well as suggestions for your consideration as you work to finalize the SWAP. In particular, we highlight the beaver as an important ally for conservation of aquatic and wetland ecosystems which house species of greatest conservation need ("SGCN") in South Carolina.

Conservation of keystone or umbrella species that are considered common, or less rare, should still be prioritized since their cascading benefits can protect and restore threatened and endangered species. For instance, the beaver (*Castor canadensis*) is a common keystone species and ecosystem engineer that creates native wetland habitats in all 5 ecoregions of South Carolina.¹ They are associated with many ecological systems in the state, including fens and spray cliffs, mountain pools and impoundments, wet meadows, early successional habitats, freshwater streams, rivers, lakes, and ponds, piedmont pools, depressions, and impoundments, floodplains, forests, and other freshwater wetlands. This species provides many ecological services through their ability to create and maintain wetlands and should be prioritized in conservation actions. South Carolina Department of Natural Resources ("SCDNR") elegantly summarizes the importance of these ecosystem engineers, stating:

Beavers produce excellent habitat for many species of wildlife. Waterfowl, furbearers, fish, reptiles and amphibians all benefit from the beaver's presence. The wood duck, the only duck which nests in South Carolina in large numbers, is very fond of beaver ponds.¹

We would like to thank SCDNR for recognizing that beaver activity creates useful impoundments in the Piedmont area and controls vegetation in fens, and that beaver ponds can

¹ SC Dep't. Nat. Res., *Beaver Management Control in South Carolina* 4 (September 2016), <https://www.dnr.sc.gov/wildlife/publications/pdf/BeaverManagementControl.pdf>.

help support waterfowl management objectives and provide fishing opportunities as part of the Belfast Plantation conservation project.²

However, despite the potential of beaver-created and beaver-maintained habitat to contribute to a variety of species conservation efforts in South Carolina, the draft SWAP contains little other discussion of beavers or actions to facilitate beaver conservation. Among other benefits, through the creation and maintenance of wetlands, beavers can help manage and conserve SGCN. We ask that South Carolina's 2025 SWAP include further research on the benefits of beavers to ecosystems in South Carolina and specific provisions for beaver conservation when related to the restoration and maintenance of habitats important for SGCN.

South Carolina has lost almost 1.8 million acres of its wetlands since the mid-1700s and, unlike other states in the Southeast, has seen a decline instead of an increase in forested wetlands.³ Action items listed under the conservation action areas ("CAAs") of land management and habitat protection and restoration include maintaining and enhancing natural wetlands to serve as floodwater storage and wildlife habitat and exploring new techniques for wetland restoration⁴. Beavers can play a key role in wetland conservation and restoration. Beaver dams serve as a natural wetland creation mechanism by slowing the velocity of water, encouraging lateral spreading, and saturating larger areas of soil.⁵ Beavers create a complex wetland habitat ranging in age and successional stage that is more resilient to flooding, drought, and other symptoms of climate change, and enhances and connects adjoining habitat for a variety of species, including SGCNs.⁶

Established beaver dams are capable of withstanding significant flood events while slowing down floodwaters and reducing erosion and other damage downstream.⁷ Areas dammed by beavers have increased water storage capacity and can reroute water to longer subsurface flow paths. These mechanisms create a buffer against drought for the wetland and downstream habitats and improve groundwater storage and aquifer recharge.⁸ The benefits multiple beaver dam-pond pairs provide ecosystems include: (i) maximizing habitat diversity and providing migration pathways and refugia for diverse organisms; (ii) "maximizing lateral and vertical connectivity across the entire river corridor, while limiting longitudinal connectivity," leading to "enhanc[ed] storage of surface and subsurface water, sediment, nutrients, and organic matter;" and (iii) reducing peak flows and sediment transport if one dam fails.⁹

² *South Carolina's State Wildlife Action Plan*, SC Dep't Nat. Res. at 3-5, 3-12, 9-33 (Feb. 1, 2025) [hereinafter "SC SWAP"].

³ SC SWAP at 2-14, 10-7.

⁴ *Id.* at 8-7, 8-15.

⁵ U.S. Fish & Wildlife Serv., *The Beaver Restoration Guidebook: Working with Beaver to Restore Streams, Wetlands, and Floodplains* 4 (M.M. Pollock, G.M. Lewallen, K. Woodruff, C.E. Jordan and J.M. Castro eds., 2023) [hereinafter "Guidebook"].

⁶ *See id.* at 5.

⁷ *See* Emily Fairfax & Cherie Westbrook, *The Ecology and Evolution of Beavers: Ecosystem Engineers that Ameliorate Climate Change*, 55 *Ann. Rev. of Ecology, Evolution, and Systematics* 323, 334 (2024).

⁸ *Id.* at 335-36.

⁹ Ellen Wohl and Shreeram Inamdar, *Beaver Versus Human: The Big Differences in Small Dams*, 12 *WIREs Water* 12:e70019, at 17 (March 27, 2025).

The storage of sediment and nutrients within beaver ponds can also help filter pollutants and improve downstream water quality.¹⁰ Beaver wetlands also reduce the effects of wildfire and provide refugia to a host of wildlife species during wildfires, although most of this evidence base consists of studies in the western United States.¹¹ We recommend SCDNR research the effects of beaver wetlands on wildfires within the state, especially given the increase of wildfire risk projected for the southeast¹².

These beaver-created, climate change-resistant ecosystems can also increase biodiversity and reverse habitat loss.¹³ Beaver-created wetlands generally have a positive impact on terrestrial and aquatic invertebrate diversity,¹⁴ the abundance of waterfowl, amphibian diversity, reptiles, and the abundance and diversity of fish species.¹⁵ On a landscape scale, beavers can increase overall plant species richness “by creating a new mosaic of terrestrial and aquatic vegetation habitats.”¹⁶

Prioritizing beavers can protect and enhance dozens of SGCN listed in the South Carolina SWAP. For example, beaver activity, alongside fire disturbance, is a known component to healthy Golden-winged Warbler habitat.¹⁷ Other critically imperiled species which rely on beaver ponds include the Northern Long-eared Bat, Gray Bat, Bog Turtle, Black Rail, Eastern Brook Trout, Southern Shield Wood-fern, and featherfoil.¹⁸

Imperiled species which rely on the ecosystem services of beavers include the Little blue heron, Yellow-crowned Night Heron, King Rail, Wood Stork, Rafinesque's Big-eared Bat, and Hoary Bat.¹⁹

¹⁰ Graham A. Puttock, et al., *Eurasian beaver activity increases water storage, attenuates flow and mitigates diffuse pollution from intensively-managed grasslands*, 576 Sci. Total Env't 430 (2017), <https://doi.org/10.1016/j.scitotenv.2016.10.122>.

¹¹ See Emily Fairfax, et al., *Impacts of beaver dams on riverscape burn severity during megafires in the Rocky Mountain region, western United States*, 562 Geological Soc'y Am. 131 (Feb. 15, 2024).

¹² Victoria M. Donovan et al., *Increasing Large Wildfire in the Eastern United States*, 50 Geophysical Research Letters, e2023GL107051 (2023), <https://doi.org/10.1029/2023GL107051>.

¹³ Fairfax & Westbrook, *supra* n.7 at 337.

¹⁴ Brian M. Bush & Scott A. Wissinger, *Chapter 12: Invertebrates in Beaver-Created Wetlands and Ponds*, in *Invertebrates in Freshwater Wetlands: An Int'l Perspective on their Ecology* 411, 432 (Darold Batzer and Dani Boix eds., 2016).

¹⁵ David R. Butler, *The Reintroduction of the Beaver into the South*, 31 Se. Geographer 39, 41 (1991).

¹⁶ See Annegret Larsen, et al., *Dam builders and their works: Beaver influences on the structure and function of river corridor hydrology, geomorphology, biogeochemistry and ecosystems*, 218 Earth-Science Revs. (May 2021), at 31.

¹⁷ *SWAP 2025 SGCN List* (Miss. Wildlife, Fisheries & Parks, June 17, 2026), <https://perma.cc/GF4U-2NUQ?type=standard> [hereinafter “SGCN List”]; see also *Sustainably Managing Forests Creates Golden-winged Warbler Breeding Habitat*, U.S. Dep't, of Agriculture, <https://perma.cc/3Q4L-XUG8>.

¹⁸ SGCN List; See Dan Rankin, et al., *Eastern Brook Trout, Supplemental Volume: Species of Conservation Concern*, in SC SWAP 2 (2015); U.S. Fish & Wildlife Serv., *Beavers Work to Improve Habitat* (last visited Feb. 14, 2025), <https://www.fws.gov/story/beavers-work-improve-habitat>.

¹⁹ *Id.*

Vulnerable SGCN which rely on beaver-created habitat include the Eastern Chicken Turtle, Prothonotary Warbler, Ironcolor Shiner, Tricolor Bat, Southeastern Myotis, Silver-haired Bat, and Northern Yellow Bat.²⁰ SGCN that rely on habitat noted as being created by beaver in other areas of the Southeast include the American Woodcock and Rusty Blackbird.²¹

The above are not exhaustive lists of the plants and animals in need of conservation help in South Carolina that can and do benefit from beaver habitats. We recommend that SCDNR research other SGCN species that benefit from beaver habitats and consider acknowledging in the 2025 SWAP the important role that beavers play in South Carolina's ecosystems, how they may benefit the state's diverse groups of flora and fauna, and how they can contribute to the conservation of these SGCN.

Despite the many benefits from beavers, we recognize that SCDNR has identified valid concerns about the presence of beavers in certain areas, largely that flooding acts as a nuisance for landowners and can damage infrastructure. Aligning with the words of SCDNR, "keeping an open dialogue with developers, and thinking 'outside the box', should provide future opportunities to work cohesively to benefit wildlife and habitats;"²² we therefore recommend SCDNR research the use of non-lethal beaver management methods in order to minimize damage caused by beavers. Flow devices and fencing across a variety of beaver-influenced ecosystems can minimize disruption to landowners and other species. These tools, when installed by trained professionals, can be used to manage water levels, leading to an increased tolerance for the presence of beavers so communities may benefit from their ecological services.

Additionally, we strongly urge SCDNR to prioritize the use of flow devices and other nonlethal tools for beaver management as needed for the preservation of habitat for SGCN, and to utilize trapping as a last resort. Since a significant amount of habitat in South Carolina is privately owned, we recommend that the 2025 SWAP include public education about nonlethal management tools, such as flow devices that address flooding concerns, as well as wrapping trees in wire²³ and fencing off other vegetation to address tree damage. We also encourage SCDNR to work with SCDOT and municipalities to adopt nonlethal management strategies.

Where a site is unsuitable for the presence of beavers but would still benefit from the impacts of their activity, using beaver mimicry such as beaver dam analogs ("BDA"), post assisted log structures ("PALS"), and other low-tech, process-based restoration methods would similarly benefit the ecosystem. The Corps of Engineers recently released a draft of the updated Nationwide Permit 27 to explicitly include these restoration methods.²⁴

²⁰ *Id.*

²¹ See, e.g., Todd Schneider & Tim Keyes, *Birds Technical Team Report for Georgia's 2025 State Wildlife Action Plan* 11, 13 (Ga. Dep't of Nat. Res., Feb. 19, 2025 DRAFT); See [Draft] *Species of Greatest Conservation Need: Freshwater Fish* 10, Va. Dep't Wildlife Res. (2025), <https://perma.cc/42U2-4UT4>; Lisa Kruse et al., *Plants Technical Team Report* 51 (Ga. Dep't of Nat. Res., Feb. 19, 2025 DRAFT).

²² SC SWAP at 4-7.

²³ See Cherie J. Westbrook and Kirby England, *Relative Effectiveness of Four Different Guards in Preventing Beaver Cutting of Urban Trees*, 7 J. of Urban Ecology, <https://doi.org/10.1093/jue/juab021>.

²⁴ See *id.* at 69.

Because of the numerous benefits of beaver activity and beaver mimicry structures to ecosystems generally and SGCN specifically, we ask that South Carolina's 2025 SWAP support further research on the ecosystem benefits of beaver activity and beaver mimicry structures within South Carolina, especially regarding groundwater recharge, drought resilience, stream temperature, habitat creation from woody debris, and beaver conservation related to the preservation and maintenance of habitat of related SGCN. We also encourage SCDNR to pursue conservation actions that improve and preserve hydrologic connectivity and hydrologic and geomorphic integrity including restoration methods which use beavers or beaver mimicry.

We urge SCDNR to actively encourage and promote maintaining beaver habitat in natural areas to create, restore, and maintain freshwater marshes, as well as other ecosystems reliant on beaver activity. We also urge SCDNR to focus on the benefits brought by the presence of this keystone species, and to utilize and encourage the public to use the non-lethal management strategies highlighted above.

We appreciate this opportunity to support and provide feedback on South Carolina's Draft 2025 SWAP. We look forward to working with SCDNR to help conserve and restore the ecosystems which house the state's rich biodiversity. If you have any questions or would like to discuss these comments further, please contact us at southeastbeaver@gmail.com.

Sincerely,

Tony Able
Chair

Catherine Crafa
Vice Chair