

**SOUTHEAST
BEAVER ALLIANCE**



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Via E-mail to Jeff.Trollinger@dwr.virginia.gov

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Re: Draft 2025 State Wildlife Action Plan

To Whom it May Concern,

The Southeast Beaver Alliance submits these comments regarding the draft of Virginia'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 Virginia.

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 considered common throughout Virginia and is associated with many ecological systems in the state; however, this species also provides many ecological services and should be prioritized in conservation actions. The Virginia Department of Wildlife Resources' ("VDWR") North American Beaver information page elegantly summarizes the importance of these ecosystem engineers, stating:

[B]eaver dams result in a number of invaluable ecosystem services that benefit a multitude of other aquatic, avian, and terrestrial wildlife species. Such services also benefit humans through reducing the severity of droughts and floods, attracting desirable wildlife species, and even contributing to groundwater recharge.¹

We first would like to thank VDWR for acknowledging the historic and positive impacts that beavers have on Virginia's landscape, including their importance to riverine floodplain ecosystems, swamps and wetlands, ponds, and early successional forests. In particular, the Alliance supports the inclusion of language which states that beaver ponds "support a variety of SGCN that either permanently or seasonally use these habitats," and details how these ponds aid

¹ *North American Beaver*, Va. Wildlife Res. Div. (last updated March 18, 2025), <https://dwr.virginia.gov/wildlife/information/north-american-beaver/>.

in the formation of resilient wetlands, increase groundwater levels, and improve water quality by decreasing the amounts of nutrient runoff and reducing sedimentation.²

We strongly support the inclusion of wetland conservation and restoration as one of VDWR's highest priorities in order to improve water quality and maintain resilience to changing precipitation patterns and increasing temperatures.³ Beavers can play a key role in this goal of 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.⁴ 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 adjoining habitat for other species, including SGCNs.⁵

Established beaver dams are also capable of withstanding significant flood events while slowing down floodwaters and reducing erosion and other damage downstream.⁶ Areas dammed by beaver increase 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.⁷ 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.⁸ We recommend VDWR research the effects of beaver wetlands on wildfires within the state, especially given the increase of wildfire risk projected for the southeast⁹.

These beaver-created, climate change-resistant ecosystems can also increase biodiversity and reverse habitat loss.¹⁰ Beaver-created wetlands generally have a positive impact on terrestrial invertebrate diversity,¹¹ the abundance of waterfowl, and the abundance and diversity of fish

² See Va. Dep't. Wildlife Res., *Virginia Wildlife Action Plan* (2025) at 74 [hereinafter "Draft SWAP"].

³ See Draft SWAP at 67, 69.

⁴ 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").

⁵ See *id.* at 5.

⁶ 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).

⁷ *Id.* at 335–36.

⁸ 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).

⁹ Victora M. Donovan et al., *Increasing Large Wildfire in the Eastern United States*, 50 Geophysical Research Letters, e2023GL107051 (2023), <https://doi.org/10.1029/2023GL107051>.

¹⁰ Fairfax & Westbrook, *supra* n.6. at 337.

¹¹ 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).

species.¹² On a landscape scale, beavers can increase overall plant species richness “by creating a new mosaic of terrestrial and aquatic vegetation habitats.”¹³

Prioritizing beavers can protect and enhance dozens of SGCN listed in the Virginia SWAP. For example, beaver activity is a known component to healthy Golden-winged Warbler habitat alongside fire disturbance.¹⁴ Reptile SGCN which rely on beaver-created habitat include Common Rainbow Snake, Spotted turtle, Smooth greensnake, Eastern Mudpuppy. And the wet meadows that result when beavers abandon their ponds may provide habitat for the bog turtle—an SGCN of critical conservation need in Virginia.¹⁵ SGCN that rely on habitat created by beaver dams include plants like Creeping burhead, Cuckoo flower, Dusty Zenobia, featherfoil, Horsetail spikerush, Large cranberry, Narrow-panicked rush, Slender sand sedge, Tawny cottongrass, and Twining bartonia, as well as freshwater fish like the Blackbanded sunfish, Ironcolor shiner, Lake chubsucker, Lined topminnow, and Mud sunfish.¹⁶ Other fish species may benefit from beaver activity; for example, brook trout are known to frequently use the cold water found in beaver ponds throughout their range.¹⁷ We recommend VDWR research whether beaver ponds could be used to support the species’ population in Virginia.

The Alliance commends VDWR for including a conservation action of educating landowners on the importance of beavers in maintaining fish and wildlife habitat and submerged vegetation in ponds and lakes, as well as promoting flow devices as a primary nonlethal management tool.¹⁸ We recommend that the 2025 SWAP include public education about other nonlethal management tools, such as wrapping trees in wire¹⁹ and fencing off other vegetation to address tree damage in addition to flow devices that address flooding concerns, expanding the

¹² David R. Butler, *The Reintroduction of the Beaver into the South*, 31 Se. Geographer 39, 41 (1991).

¹³ 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.

¹⁴ [Draft] *Species of Greatest Conservation Need: Birds* 6, Va. Dep’t. Wildlife Res. (2025), <https://dwr.virginia.gov/wp-content/uploads/media/2025-SGCN-Birds.pdf>; see also Sustainably Managing Forests Creates Golden-winged Warbler Breeding Habitat, U.S. Dep’t, of Agriculture, <https://www.nrcs.usda.gov/wildlife>.

¹⁵ See [Draft] *Species of Greatest Conservation Need: Reptiles* 1 (Va. Dep’t Wildlife Res., 2025), <https://dwr.virginia.gov/wp-content/uploads/media/2025-SGCN-Reptiles.pdf>; see also D. Sollenberger & T. Floyd, *Reptile and Amphibian Technical Team Report for Georgia’s 2025 State Wildlife Action Plan Revision 3* (Ga. Dep’t of Nat. Res., Feb. 19, 2025 DRAFT); see also [Draft] *2025 North Carolina State Wildlife Action Plan*, ch. 4, at 131, (N.C. Wildlife Res. Comm., 2025).

¹⁶ See [Draft] *Species of Greatest Conservation Need: Freshwater Fish* 3, 10, 11, 13, Va. Dep’t Wildlife Res. (2025), <https://dwr.virginia.gov/wp-content/uploads/media/2025-SGCN-Freshwater-Fish.pdf>; see also [Draft] *Species of Greatest Conservation Need: Plants* 9-11, 13-16, 22-25, 28, Va. Dep’t Wildlife Res. (2025), <https://dwr.virginia.gov/wp-content/uploads/media/2025-SGCN-Plants.pdf>.

¹⁷ Michael M. Pollack, et al., *Field experiments to assess passage of juvenile salmonids across beaver dams during low flow conditions in a tributary to the Klamath River, California, USA*, 17(5) PLOS one, May 24, 2022, at 19; 7 Dan Rankin, et al., *Eastern Brook Trout, Supplemental Volume: Species of Conservation Concern*, SC SWAP (2015); U.S. Fish & Wildlife Service, *Beavers Work to Improve Habitat* (last visited Feb. 14, 2025), <https://www.fws.gov/story/beavers-work-improve-habitat>.

¹⁸ See *id.* at 137.

¹⁹ 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>.

non-lethal management options available to consider. We also encourage VDWR to work with VDOT and municipalities to adopt nonlethal management strategies.

We commend VDWR for including the removal of beaver dams and beavers as a threat to beaver ponds and similar habitats.²⁰ Additionally, we support VDWR's decision to include beaver dam management and dismantling as a threat to natural system modifications, as it leads to drying out the beaver-created basin, flooding lands downstream, and losing accumulated sediments downstream.²¹ The Alliance also appreciates the inclusion of beaver trapping, including incidental killing, as a threat to wildlife biological resources.²² We urge VDWR to continue to actively encourage and broadly promote maintaining beaver habitat on suitable sites, including through the non-lethal management strategies highlighted above (e.g. flow devices).

Despite the benefits from beavers and these mitigation strategies, Virginia's 2025 SWAP highlights valid concerns about the presence of beavers. Flooding or drainage of habitats by beaver activity acts as a nuisance for landowners and can damage infrastructure. We again thank VDWR for including education on the use of pond levelers as a nonlethal method of beaver management.²³ We recommend VDWR research use of pond levelers and fencing across a variety of beaver-influenced ecosystems to minimize disruption to landowners and other species. Additionally, we strongly urge VDWR 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.²⁴

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;²⁵ such approaches have been used in Virginia by American Climate Partners' Rapidan Institute in the Northern Piedmont²⁶ and Virginia Tech's StREAM Lab has also installed a BDA in Stroubles Creek to study hydrologic and water quality changes caused by beaver dams.²⁷

Because of the numerous benefits of beaver activity and beaver mimicry structures to ecosystems generally and SGCN specifically, we ask that Virginia's 2025 SWAP support further research on the ecosystem benefits of beaver activity and beaver mimicry structures within Virginia, especially regarding groundwater recharge, drought resilience, stream temperature,

²⁰ See *id.*

²¹ See *id.* at 124.

²² See *id.* at 120.

²³ See Draft SWAP at 137

²⁴ See, e.g., [Draft] *Species of Greatest Conservation Need: Plants* 9-11, 13-16, 22-25, 28, Va. Dep't Wildlife Res. (2025), <https://dwr.virginia.gov/wp-content/uploads/media/2025-SGCN-Plants.pdf>.

²⁵ See *id.* at 69.

²⁶ *Rapidan Institute: Virginia Beaver Working Group*, American Climate Partners (last accessed July 9, 2025), <https://americanclimatepartners.org/rapidan-institute/>.

²⁷ W. Cully Hession, P.E., *Research: Current Projects*, Virginia Tech (last accessed July 9, 2025), <https://www.bse.vt.edu/people/cully-hession.html>.

habitat creation from woody debris, and beaver conservation related to the preservation and maintenance of habitat of related SGCN. We also encourage VDWR to pursue conservation actions that promote and preserve hydrologic connectivity.

However, we also recommend removing subsection 8.3 “Habitat Alteration by Beavers”²⁸ under section 5 “Threats” because it contradicts the use of beavers to support SGCN that is emphasized elsewhere in the draft SWAP and lacks a convincing evidence base. Among the SGCN sheets, we are only able to find one example—Monarch butterflies—where any of these threat categories (8.3, 8.3.1, 8.3.2, 8.3.3, or 8.3.4) are included for any species. The assessment for Monarch butterflies states: “Also, the wintering grounds (Mexico) are highly vulnerable to habitat destruction (8.3.1)...” wherein threat 8.3.1 is “increased grazing by vertebrates” from habitat alteration by beavers. The relationship between beavers and Monarch population declines is spurious at best²⁹ and it is unclear why beaver activity in Virginia is cited as a cause of this threat or how managers in Virginia could use this information to make decisions that would improve Monarch populations. Furthermore, we are unaware of any scientific evidence that beaver activity increases grazing by vertebrates or invertebrates, pest epidemics, or predation by mesopredators to the extent that any of these ecological changes result in the primary threats to SGCN writ large, including for the example used in 8.3.2 (i.e. no direct evidence that beaver activity increases grazing on American ginseng by native slugs).

For these reasons, we recommend removing this section unless more text is added to clarify how these indirect outcomes of beaver activity result in demonstrable threats to SGCNs, with references to supporting evidence and where each of the threat categories is included in the SGCN assessments at least once. We would certainly support the SWAP encouraging more research on the impacts of beaver activity on SGCNs to identify potential trade-offs from negative consequences not yet known in the literature.

We appreciate this opportunity to support and provide feedback on Virginia’s Draft 2025 SWAP. We look forward to working with VDWR 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

²⁸ U.S. Army Corps of Engineers, *Draft Decision Document, Nationwide Permit 27* (2025) at 126, <https://usace.contentdm.oclc.org/utis/getfile/collection/p16021coll9/id/3101>.

²⁹ Joseph Belsky and Neelendra K. Joshi, *Assessing Role of Major Drivers in Recent Decline of Monarch Butterfly Population in North America*, 6 *Frontiers in Environmental Science* 10.3389/fenvs.2018.00086 (2018), <https://doi.org/10.3389/fenvs.2018.00086>; see also Jay E. Dittendorfer et al., *Changes in landscape and climate in Mexico and Texas reveal small effects on migratory habitat of monarch butterflies (Danaus plexippus)*, 14 *Scientific Reports* 6703 (2024), <https://www.nature.com/articles/s41598-024-56693-z>.