

**Recommendation for the Designation of  
Small-anthered Bittercress  
*Cardamine micranthera* Rollins  
as a Virginia Species of Greatest Conservation Need**

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The Virginia Department of Wildlife Resources, with support from the Virginia Department of Conservation and Recreation-Division of Natural Heritage, recommends the addition of small-anthered bittercress (*Cardamine micranthera* Rollins) to Virginia's list of Species of Greatest Conservation Need as a tier I-B species (Appendix 1).

JUSTIFICATION

Species Summary

*Cardamine micranthera* (small-anthered bittercress; G2/S2, Fed LE/State LE) (Appendix 2) was listed as Federally Endangered by the U.S. Fish and Wildlife Service in September 1989 due to conversion of its habitat for agricultural and silvicultural uses, floods, stream channelization and impoundment, and encroachment of exotic plants (USFWS, 1989). In addition to its federal status, *Cardamine micranthera* is ranked G2 (imperiled) by NatureServe and the Natural Heritage Network, meaning that it is a high conservation priority on a global scale (NatureServe, 2022). Natural habitat includes wet, boggy soils of deciduous woodlands and moist to wet soils along the edge of small to intermediate sized streams undisturbed by livestock trampling, silviculture, or highly influenced by invasive species (Murdock, N., and A. Weakley, 1991). This globally rare herb is known from only 3 contiguous counties in Virginia and North Carolina, where it is restricted to the Dan River drainage (Stanley, 2021). Much of the natural habitat surrounding these streams has been converted to pastures, agriculture, and residential property, leaving populations vulnerable to numerous negative impacts and little natural habitat (Stanley, 2021).

Trends

There are 16 documented populations of *Cardamine micranthera* in Virginia, all restricted to the Dan River drainage. These occurrences are of varying quality, with over a third having fair to

poor viability and one population likely extirpated (VA DCR, 2022). There are currently no protected sites in Virginia. Populations vary in size, ranging from solitary plants to 10,000 individuals. Large natural fluctuations in numbers from year to year have been documented (USFWS, 2016) but downward trends due to habitat degradation are also likely. Long-term trends are difficult to discern due to this natural variability and the near lack of monitoring data (USFWS, 2016). The disappearance of one Virginia population and the decline of another as noted by Van Alstine and Killeffer (1999) cannot be assigned with certainty to natural variation or human influence. In Virginia, the emphasis has been exploring new habitat rather than monitoring existing populations. Conversion of open land to forest will likely improve habitat quality; existing land uses threaten populations due to impacts such as erosion and hydrological modification (NatureServe, 2022).

### Conservation Action

Conservation actions recommended for *Cardamine micranthera* include improving surrounding land use to benefit the species at known locations, conducting additional survey work on private and public land, and monitoring known populations to better understand what factors are driving population size.

Most threats to the species stem from surrounding land uses. The habitats surrounding the streams inhabited by *Cardamine micranthera* have largely been converted to pastures, agriculture, and residential property. As a result, populations are often affected by erosion and sedimentation, herbicide drift, and livestock. Streambed habitats are often subjected to channelization, diversion, damming, and reshaping (Stanley, 2021). Invasive species, particularly those that thrive in wet environments, are often plentiful in or near *Cardamine micranthera* populations. These aggressive species can suppress the development of *Cardamine* plants and negatively alter stream microhabitats; management is essential.

Survey efforts on public lands should be prioritized but continued efforts to access private land is needed due to regional ownership patterns. Future element occurrence updates should include surveying adjacent properties. Creeks and small drainages have been a primary focus of surveys, but nearly half of the plants discovered in 2020 were found in seepages. Shifting survey efforts to low flat areas, especially along toe slopes, may lead to the discovery of new populations. (Stanley, 2021). Increased monitoring of populations is needed to determine the population dynamics of *Cardamine micranthera* with respect to natural and human-caused disturbances.

### Summary

*Cardamine micranthera* (small-anthered bittercress) is proposed for inclusion in the Virginia State Wildlife Action Plan as a tier I-B species due to the low number of populations, significant threats to occupied habitats, and the degraded conditions of the landscape inhabited by the plant. Since no Virginia populations are protected or being managed to benefit the species, conservation actions are imperative.

**This species occurs only in the West Piedmont Planning District Commission.**

### References

Murdock, N., and A. Weakley. 1991. Recovery plan for small-anthered bittercress (*Cardamine micranthera* Rollins). U.S. Fish and Wildlife Service, Southeast Region, Atlanta, GA. 22 pp.

NatureServe. 2022. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available <https://explorer.natureserve.org/>.

Stanley, J.S. 2021. A 2020 Survey for *Cardamine micranthera* Rollins (Small-anthered Bittercress) in Patrick and Henry Counties, Virginia. Natural Heritage Technical Report 21-01. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. January 2021. 31 pp. including appendices.

United States Fish and Wildlife Service (USFWS). 1989. Small-anthered bittercress determined to be endangered. Federal Register 54(182): 38947-38949.

United States Fish and Wildlife Service (USFWS). 2016. Small-anthered bittercress (*Cardamine micranthera*) 5-year review: Summary and Evaluation. USFWS Southeast Region, Asheville Ecological Field Services Office, Asheville, North Carolina.

Van Alstine, N.E. and S.E. Killeffer. 1999. Status survey for *Cardamine micranthera* Rollins (small-anthered bittercress) in Virginia. Natural Heritage Tech. Rept. 99-23. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. 45 pp.

Virginia DCR Natural Heritage Program (VA DCR). 2022. Biotics 5 database. Virginia DCR Natural Heritage Program, Richmond, Virginia.