Recommendation for the Designation of
Small Whorled Pogonia
Isotria medeoloides (Pursh) Raf.
as a Virginia Species of Greatest Conservation Need

Contacts
Becky Gwynn, Executive Deputy Director
Virginia Department of Wildlife Resources
mailto:becky.gwynn@dwr.virginia.gov
A 7870 Villa Park Drive, P.O. Box 90778, Henrico, VA 23228-0778
(804) 593-2043

Jason Bulluck, Director
Virginia Natural Heritage Program
Department of Conservation and Recreation
mailto:jason.bulluck@dcr.virginia.gov
600 East Main Street Richmond, Virginia 23219
(804) 786-8377

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 Whorled Pogonia (*Isotria medeoloides* (Pursh) Raf) to Virginia's list of Species of Greatest Conservation Need as a tier 1-A* species (Appendix 1).

Justification

Species Summary
Isotria medeoloides (Small Whorled Pogonia; G2?/S2, Fed LT/State LE) (Appendix 2) was listed as Federally Endangered by the U.S. Fish and Wildlife Service on September 9, 1982 due to habitat loss and collection (USFWS 1982). It was downgraded to Threatened status on October 6, 1994 (USFWS 1994). *Isotria medeoloides* is ranked G2? (imperiled) by NatureServe and the Natural Heritage Network, meaning that it is at high risk of extinction on a global scale. (NatureServe 2023). This perennial member of the orchid family (Orchidaceae) is found in a variety of hardwood forest types, usually in areas with low shrub cover. It is known from a large number of eastern states, ranging from Maine and adjacent Ontario to Georgia and sporadically westward to Illinois and Missouri (BONAP 2015, Natureserve 2023). Habitat destruction or alteration is the primary threat to the species' continued existence but conversion of hardwood forests to other cover types, forest succession, and deer browsing pose significant problems. Although populations are found over a large geographic area and the number of populations is relatively large for a listed species, the average number of individuals per population is low and the global population size is estimated to be less than 3,000 plants (Natureserve 2023). The vast majority of plants are sterile in any given year, implying low recruitment of plants from seed. Brumback et al (2011), working in New England, demonstrated that light increases induced by canopy thinning can increase plant numbers and reproduction. Whigham et al (2021) further proposed that fungal abundance induced by decaying tree roots may be equally as important as light in increasing population size.

Trends

There are 56 extant populations of *Isotria medeoloides* in Virginia, 8 additional populations of historical occurrence only, and two population thought to be extirpated (VA DCR, 2023). Less than 300 populations exist range-wide and many are historical or are known to be extirpated (NatureServe 2023). The average number of plants per population is usually low. In Virginia it is unusual to see more than 10 plants at any one location (VA DCR 2023) but some exceptional New England populations number in the low hundreds. *Isotria medeoloides* has been extirpated from 4 states. Declines are estimated at 10%-50% across its range but factors such as dormancy can confound the assessment of populations, particularly those with low population numbers. Of the 27 Virginia sub-populations visited by Van Alstine (2016), no plants were found at about half of the locations; the true status of these populations can only be gained through repeated visits so it is not known whether these populations are extirpated, not found due to such low numbers, or dormant. Rapid population growth and development in northern Virginia has almost certainly destroyed populations since it is the regional stronghold for the species. Observations have shown the negative impacts that habitat patch size and human proximity can have on population trends.

Conservation Action

Conservation actions recommended for *Isotria medeoloides* include protecting habitat from development and managing habitats through shrub removal and minor canopy thinning or girdling of an occasional tree. The latter could increase plant numbers and reproduction due to both increased light and the presence of decaying tree roots and stems which induces the growth of mycorrhizal fungi (Whigham et al 2021).

Inventory of *Isotria* habitat has been a priority in Virginia for decades but is far from complete. Given the large amount of *Isotria* habitat available across Virginia, fluctuating population sizes, and relative inaccessibility of private land, populations have likely escaped detection. Finding these populations will increase the chances for their conservation, particular by minimizing human impacts.

Summary

Isotria medeoloides (Small Whorled Pogonia) is proposed for inclusion in the Virginia State Wildlife Action Plan as a tier 1-A species due to habitat impacts and the need for active management of its hardwood forest habitat.

This species occurs in the following Planning District or Regional Commission areas:

LENOWISCO Planning District Commission
New River Valley Regional Commission
Roanoke Valley-Alleghany Regional Commission
Central Shenandoah Planning District Commission
Northern Virginia Regional Commission
Rappahannock-Rapidan Regional Commission
Thomas Jefferson Planning District Commission
Region 2000 Local Government Commission

West Piedmont Planning District Commission
Commonwealth Regional Council
Richmond Regional Planning District Commission
George Washington Regional Commission
Northern Neck Planning District Commission
Crater Planning District Commission

References

Brumback, W.E., S. Cairns, M.B. Sperduto, C.W. Fyler. 2011. Response of an Isotria medeoloides Population to Canopy Thinning. Northeastern Naturalist 18 (2) 185-196. https://doi.org/10.1656/045.018.0205

Kartesz, J.T., The Biota of North America Program (BONAP). 2015. North American Plant atlas. (http://bonap.net.napa). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, Verson 1.0 Biota of North America Program (BONAP). (in press)].

NatureServe. 2023. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.137976/Isotria_medeoloides [Accessed: Apr. 13, 2023].

United States Fish and Wildlife Service (USFWS). September 10, 1982. Determination of *Isotria medeoloides* (small whorled pogonia) to be an Endangered Species. Federal Register Vol 47 (Number 176): 39827-39831.

U.S. Fish and Wildlife Service (USFWS). 1994. Final rule to reclassify the plant *Isotria medeoloides* (small whorled pogonia) from endangered to threatened. Federal Register 59(193) 50852-50857.

Van Alstine, N.E. 2016. A 2015 survey for *Isotria medeoloides* (Pursh) Raf. (small whorled pogonia) in Virginia. Natural Heritage Technical Report 16-04. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. February 2016. 45 pp. plus appendices.

Virginia DCR Natural Heritage Program (VA DCR). 2023. Biotics 5 database. Virginia DCR Natural Heritage Program, Richmond, Virginia.

Whigham, D.; McCormick, M.; Brooks, H.; Josey, B.; Floyd, R.; Applegate, J. *Isotria medeoloides*, a North American Threatened Orchid: Fungal Abundance May Be as Important as Light in Species Management. Plants 2021, 10, 1924. https://doi.org/10.3390/ plants10091924

*Rank Tier 1-A based on the species' State Endangered Status; as far as the A rank, on the ground conservation strategies (land protection, fire) have been identified and some implemented. Does land protection count? Seems like that would make most species an "A" by default