

## Recently Discovered Populations of Small Whorled *Pogonia (Isotria medeoloides)* in Virginia

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Small whorled pogonia (*Isotria medeoloides*) is a rare and elusive orchid federally listed as threatened under the Endangered Species Act and state listed as endangered under the Virginia Endangered Plant and Insect Act. This orchid, extant in 15 states in the eastern and midwestern U.S. and one Canadian province (U.S. Fish and Wildlife Service, 1994), occurs in relatively common types of second- and third-growth forest habitats (U.S. Fish and Wildlife Service, 1992). In 1990, the ten extant colonies in Virginia were known only from the Coastal Plain (Ware, 1991). Two single-stem occurrences of small whorled pogonia had been documented in the Piedmont, in Buckingham and Appomattox Counties. These occurrences, however, have not been seen since their discoveries in 1968 and 1979, respectively, despite attempts to relocate them (Harvill, 1969; G. Rouse, pers. comm.; C.E. Stevens, pers. comm.). During rare plant inventories conducted from 1990-1994, we documented seven new populations of *Isotria medeoloides*. Two of these populations are located on the Coastal Plain, four are on the eastern Piedmont, and one is documented for the first time from Virginia's Cumberland Plateau.

In this paper, we describe these new *Isotria medeoloides* populations and discuss their conservation status. Information for each population appears in Table 1. Voucher photographs taken at two of the sites have been deposited at the College of William and Mary Herbarium (Photo Vouchers NVA #001 and 002 for Population 4; WHM #1526 for Population 7). Due to the rare and vulnerable status of this species, we did not collect specimens and are providing only watershed information instead of more specific locality data.

In Table 2 we have compared habitat characteristics at the seven new sites with habitat characteristics previously

documented for the species in Virginia (Ware, 1991). The majority of the new sites, including the Cumberland Plateau site, share most of these habitat characteristics.

The discovery of *Isotria medeoloides* in the Cumberland Plateau of Virginia sparked questions about how the habitat compares floristically with that of other populations, particularly those in Virginia and the southern Appalachians. Population 7 is closer geographically to the North Carolina (NC), South Carolina (SC), Georgia (GA), and Tennessee (TN) populations than to the other Virginia (VA) populations. In addition, the population occurs in a mountain physiographic province, as do the NC, SC, GA, and TN populations. A total of 32 species were recorded in a vegetation plot sampled at Population 7 (Table 3). We compared this list with lists generated for sites in VA, NC, SC, GA, and TN, as well as range wide data (Virginia Department of Conservation and Recreation, Division of Natural Heritage field survey reports; Gaddy, 1985; Mehrhoff, 1980; Rawinski, 1986; U.S. Fish and Wildlife Service, 1992; Ware, 1987; N. Murdock, pers. comm.; M. Pyne, pers. comm.; A. Shea, pers. comm.; C. Wentworth, pers. comm.). A rigorous floristic comparison was not attempted here because complete floristic plot data were not available for many of the sites. However, the following observations can be made from the available data. Two species occurring at the Cumberland Plateau site (Population 7), *Acer rubrum* and *Medeola virginiana*, are frequent associates of *Isotria medeoloides* throughout its range. No *Pinus* species occur at the Population 7 site, similar to the TN and other VA sites where *Pinus* species are either lacking or represent a minor component of the canopy. *Pinus strobus*, however, is an important canopy species in most of the NC, SC, and GA sites,

Table 1. Location and status of recently discovered *Isotria medeoloides* populations in Virginia.

Population Number	1	2	3	4	5	6	7
Province	Coastal Plain	Coastal Plain	Piedmont	Piedmont	Piedmont	Piedmont	Cumberland Plateau
County	Caroline	Caroline	Prince William	Stafford	Prince William	Prince William	Lee
Drainage Basin	Cattlet Creek	Portobago Creek	Quantico Creek	Chopawamsic Creek	Cedar Run	Powells Creek	North Fork Powell River
Discovery Date	10/27/90	6/2/94	6/6/91	6/13/91	7/11/91	7/6/93	6/22/94
Number of Stems <sup>1</sup>	4	10	33	23	4	19	6
Number in Flower/Fruit	0/2	0/3	2/7	1/0	0/0	0/0	0/3
Photo Voucher	No	No	No	Yes	No	No	Yes
Ownership	Public	Private	Public	Public	Public	Private	Public

<sup>1</sup> Number of stems seen in the year of discovery.

and in many of the sites in northern states. The montane species *Rhododendron maximum*, *Quercus prinus*, and *Viola hastata* occur at the Population 7 site and other southern Appalachian sites, but do not occur at the other Virginia *Isotria medeoloides* sites.

Of importance for the conservation of small whorled pogonia is the fact that five of the seven new populations occur on federal lands where they are afforded protection under the Endangered Species Act, as amended. Managers of these federally-owned sites are actively monitoring the populations and funding searches for new populations on their respective managed areas. In addition, one of the private landowners has agreed to designate a protection area which will be placed in a conservation easement. We encourage further surveys for *Isotria medeoloides* in the abundant, unsurveyed habitat that exists in Virginia, and we hope that the information provided here will contribute to future discoveries of this

elusive orchid.

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Table 2. Comparison of the habitat characteristics of the seven reported *Isotria medeoloides* populations with some characteristics previously observed for other Virginia populations. (Modified from a table prepared for Belden & Van Alstine, 1992).

Habitat Characteristics	POPULATIONS (PHYSIOGRAPHIC PROVINCE)						
	1 (CP)	2 (CP)	3 (Pd)	4 (Pd)	5 (Pd)	6 (Pd)	7 (CuP)
Level to moderate slope inclination	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Northern to eastern aspect	No <sup>1</sup>	Yes	Yes	Yes	No <sup>2</sup>	Partly <sup>3</sup>	Yes
% Herbaceous ground cover low to non-existent	Yes <sup>4</sup>	Yes	Yes	Yes	Yes	Yes	Yes
Acidic sandy loam soil	ND	ND	Yes <sup>5</sup>	Yes <sup>6</sup>	Yes <sup>5</sup>	? <sup>7</sup>	Yes <sup>8</sup>
Nearby canopy opening	ND	No	Yes	Yes	Yes	Yes	Yes
Presence of dead wood (includes standing dead and/or wood litter on ground)	Yes	No	Yes	Yes	Partly	Yes	Yes

CP = Coastal Plain; Pd = Piedmont; CuP = Cumberland Plateau

ND = No data collected for this characteristic.

<sup>1</sup> Southern aspect

<sup>2</sup> Level floodplain

<sup>3</sup> Northeastern aspect for most of population, but four stems on lower slope with slight western aspect.

<sup>4</sup> Although herbaceous ground cover was sparse, low ericaceous shrubs were more prominent than in the other six sites.

<sup>5</sup> Based on soil survey for Prince William County (Elder, 1989).

<sup>6</sup> Based on soil survey for Stafford County (Isgrig & Strobel, 1974).

<sup>7</sup> Population 3 is located near 3 soil map units on the Prince William Co. soil survey map (Elder, 1989), and the exact soil map unit where the *Isotria medeoloides* grows was not determined. All of the soil map units consist of acidic loams and one is an acidic sandy loam.

<sup>8</sup> Based on field analysis.

Table 3. Vascular plant taxa\* associated with *Isoetia medeoloides* at Population 7, Lee County, VA. Nomenclature follows Kartesz (1994).

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Tree stratum (>6 m tall):

*Acer rubrum*  
*Quercus prinus*  
*Quercus rubra*  
*Quercus velutina*

Shrub stratum (woody plants 1-6 m tall):

*Acer rubrum*  
*Betula lenta*  
*Castanea dentata*  
*Cornus florida*  
*Fagus grandifolia*  
*Magnolia fraseri*  
*Nyssa sylvatica*  
*Oxydendrum arboreum*  
*Rhododendron cumberlandense*  
*Rhododendron maximum*  
*Sassafras albidum*  
*Vaccinium corymbosum*

Herb stratum (<1 m tall):

*Acer rubrum*  
*Amelanchier arborea*  
*Amphicarpaea bracteata*  
*Aureolaria flava*  
*Chimaphila maculata*  
*Dichanthelium commutatum*  
*Galax urceolata*  
*Gentiana decora*  
*Kalmia latifolia*  
*Magnolia cf. acuminata*  
*Maianthemum racemosum*  
*Medeola virginiana*  
*Nyssa sylvatica*  
*Polystichum acrostichoides*  
*Rhododendron cumberlandense*  
*Sassafras albidum*  
*cf. Scutellaria sp.*  
*Smilax rotundifolia*  
*Vaccinium pallidum*  
*Vaccinium stamineum*  
*Viola hastata*

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\*The taxa were recorded on 22 June 1994 from a circular plot of 11.28m radius centered near the middle of the *Isoetia medeoloides* population. The plot included all known *Isoetia* stems.

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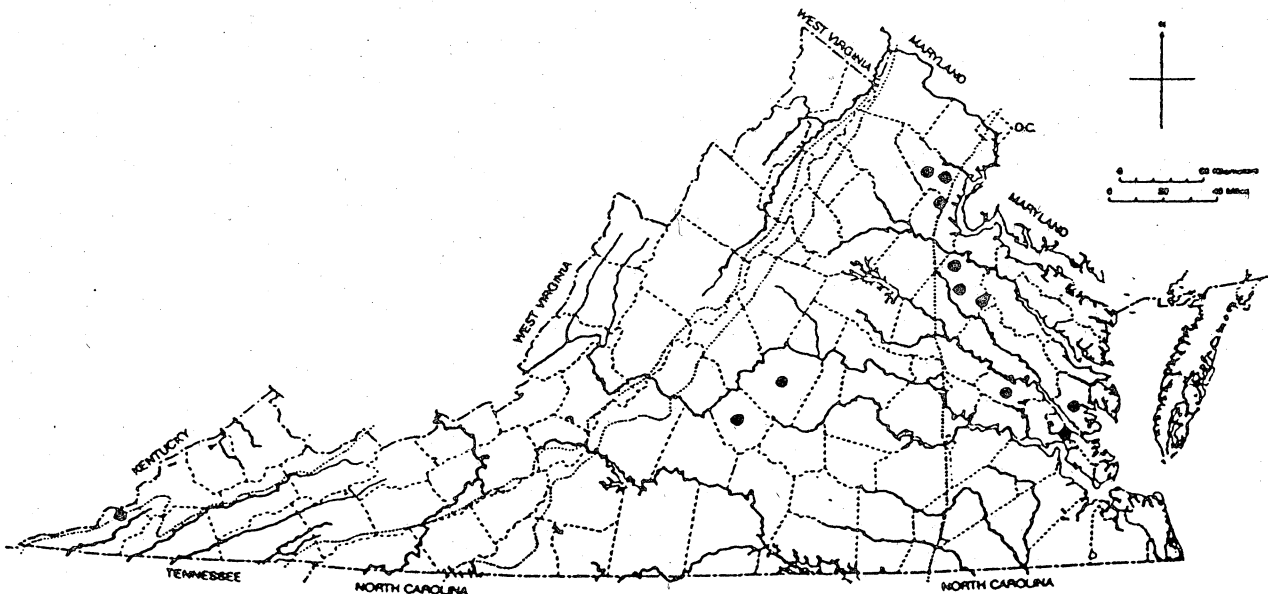


Figure 1. Known Virginia localities for *Isotria medeoloides*