



June 4, 2010

Scott Slagley  
AECOM  
4840 Cox Road  
Glen Allen, Virginia 23060

**Re: Summary Report**  
**Detailed Survey for the Small Whorled Pogonia (*Isotria medeoloides*)**  
**North Anna Power Station, Louisa County, Virginia**  
WEG Project #4317B

Dear Mr. Slagley:

This report summarizes habitat investigations and detailed surveys for the federal-listed threatened and state-listed endangered small whorled pogonia (*Isotria medeoloides*) by Williamsburg Environmental Group, Inc. (WEG), for a portion of the North Anna Power Station Property in Louisa County, Virginia. The approximate 295-acre survey area is located within the North Anna River drainage basin and is situated northeast of Kentucky Springs Road (Route 652) along Haley Drive (Route 700).

Chris Senfield of WEG, who is listed by the U.S. Fish and Wildlife Service (FWS) as a survey contact for the small whorled pogonia (SWP), coordinated this survey in accordance with habitat criteria specific to the plant. The following sections will present a brief description of the plant, the methodology utilized, and the results of this habitat survey for SWP.

**Species Description** – SWP is a self-pollinating perennial orchid (Family: Orchidaceae), four to twelve inches in height, with a characteristic whorl of five to seven leaves at the summit of a singular, hollow, pale green stem with one or two pale yellowish-green irregular flowers (Mehrhoff 1983, Gleason and Cronquist 1991, Vitt and Campbell 1997). Morphologically similar species include large whorled pogonia (*Isotria verticillata*) and Indian cucumber root (*Medeola virginiana*), the former distinguished from SWP by a reddish-purple stem and the latter by a wiry stem with cotton-like hairs (Ware 1991).

**Habitat Factors** – SWP occupies a very specific habitat type within its range. In particular, the species seems to require the following conditions: mature, mixed hardwood, upland forests; generally open understory conditions with minimal aggressive ground level species; generally level to moderately sloping land within shallow upland draws often, but not always, of northerly or easterly exposure; scattered ground-level sunlight; and, acidic, sandy loam soils (Ware 1991, Gleason and Cronquist 1991, Weakley 2010). In addition, many professionals have noted a prevalence of decaying logs and a well-developed detritus layer on the forest floor. These attributes tend to be present with the species when found, although the exact mechanisms associated with each affinity are not understood (Ware 1991).

Certain indicator species, among others, may also be helpful in identifying small whorled pogonia habitat, such as large whorled pogonia, strawberry bush (*Euonymus americanus*), tick trefoil (*Desmodium* spp.), and wintergreen (*Chimaphila maculata*). These species, among others, are considered associates, and occur frequently near documented SWP colonies. It should be noted that the absence of one or even several of the above-referenced habitat criteria does not necessarily preclude the species from occurring on a particular site. A habitat determination should therefore be based upon the experience of a qualified professional.

**Methodology** – Detailed field surveys for the SWP were conducted from May 25<sup>th</sup> to May 27<sup>th</sup>, 2010. During this time, the target species may be identified in vegetative phase (i.e. without flower or fruit). The normal vegetative cycle is late spring to mid summer. FWS approved the timing of the survey, which is not specifically defined for Louisa County, based on WEG's observation of the target species having emerged in May 2010 at locations in Virginia north of Louisa County. These observations were made by Chris Senfield and reported via personal communication with Kim Smith of FWS's Virginia Field Office.

This SWP detailed survey was conducted using general ground reconnaissance of the property boundary and all interior upland slopes. Notes were taken regarding cover types, community assemblages, slope aspect and grade, associate species, substrate, and other relevant information concerning habitat quality. Such reconnaissance and data collection allows for grouping of various regions into general habitat types: suitable, marginal, or poor, based on the presence of favorable habitat conditions for the target species. These categories represent the relative degree to which areas express favorable site attributes for the target species. Suitable habitat is present in areas that retain most of the habitat factors described above. Marginal habitat occurs in somewhat degraded areas, but based on professional judgment may still support the target species. Poor habitat is not sufficient for SWP colonization.

Detailed survey methods typically include utilization of contour transects. For the survey of potential habitat areas, a baseline is established and transects are walked parallel to the baseline on approximately 15-foot spacing, to ensure that the visual ranges of adjacent transects are overlapping. Each transect set is marked with flagging as it is searched, to ensure that subsequent transects are not established off course from the baseline. In areas determined to have marginal habitat for the species, a combination of transects and areal spot-checks are employed where topography, canopy density, and understory density reflect improved habitat.

**Results** – No SWP individuals were found within the survey area at North Anna Power Station. Several areas of marginal habitat and one area of suitable habitat are located generally in the northern part of the site. An additional area of marginal habitat is located in the southwestern portion of the survey, nearer to Route 700. The attached Small Whorled Pogonia Habitat Map depicts the approximate locations of both habitat types.

Suitable habitat generally consists of semi-mature and mature upland forests comprised of hardwood and mixed hardwood vegetative communities. The gently to moderately sloping area includes slopes with both north and east-facing aspects. In addition to a moderately open canopy, the area is characterized by an uneven-aged, partially open understory, with moderate levels of

detritus and decomposing woody debris. Overstory and sapling height vegetation includes white oak (*Quercus alba*), northern red oak (*Quercus rubra*), pignut hickory (*Carya glabra*), and American beech (*Fagus grandifolia*). The shrub stratum is well developed and includes flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), American holly (*Ilex opaca*), and young trees from canopy species. The herbaceous stratum varies in density and diversity and includes multiple associate species. Species found in this stratum include lowbush blueberry (*Vaccinium pallidum*), Virginia creeper (*Parthenocissus quinquefolia*), various seedlings from canopy species, false Solomon's seal (*Smilacina racemosa*), huckleberry wild yam root (*Dioscorea villosa*), mapleleaf viburnum (*Viburnum acerifolium*), large whorled pogonia, strawberry bush, common wintergreen, and tick trefoil.

Marginal SWP habitat in the survey area varies, from forests that share some (but not all) characteristics of the suitable habitat area, to younger forest communities that are degraded somewhat by various factors. Common degradation factors include increased shrub growth, few associate species, proximity to disturbance and evidence of past disturbance, thin/absent detritus, less decomposing woody debris, high light infiltration on the forest floor, and shallow to exposed bedrock in the soil substrate.

The remaining the survey area is considered poor, or inappropriate, SWP habitat, due to one or more limiting factors. Limiting factors include high density pine-dominated forests, clear-cut timber activity, immature forest communities, wetlands, streams, railroads, roadways/trails, and clearings in maintained areas along transmission lines or fields.

**Conclusion** – In summary, the results of this study show that SWP was not present within the survey area at North Anna Power Station. This report provides a summary of WEG's findings during the detailed survey for SWP for the purpose of inclusion with Dominion Virginia Power's Joint Permit Application for the North Anna Power Station. If you have any questions regarding the information presented herein, please feel free to call at your convenience.

Sincerely,



Chris Senfield  
Ecologist II

Enclosures

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#### References Cited

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Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*. New York Botanical Garden, Bronx, New York. p. 828.

Mehrhoff, L. A. III. 1983. Pollination in the genus *Isotria* (Orchidaceae). *American Journal of Botany* 70:1444-1453.

Vitt, P. and C. S. Campbell. 1997. Reproductive biology of *Isotria medeoloides* (Orchidaceae). *Rhodora* 99:56-63.

Ware, D. M. E. 1991. Small Whorled Pogonia, *Isotria medeoloides* (Pursh) Rafinesque. In *Virginia's Endangered Species*, K. Terwilliger, ed. McDonald and Woodward, Blacksburg, Virginia.

Weakley, A. S. 2010. *Flora of the Carolinas and Virginia*. Working draft. UNC Herbarium, University of North Carolina, Chapel Hill, NC.

295.42 ACRES ±

OF WETLANDS  
OPEN WATERS  
HAVE NOT BEEN FIELD  
RE FOR PLANNING



SURVEY LIMITS

SURVEY LIMITS

HALEY DRIVE (RTE 700)

NORTH ANNA  
NUCLEAR POWERPLANT

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