

Small Whorled Pogonia (*Isotria medeoloides*) surveys on Fort A.P. Hill and Prince William Forest Park: 2022 report of activities.

Submitted to: Cherry Keller, United States Department of Fish and Wildlife Service (USFWS), Jason Applegate, Department of Defense (DOD) Natural Resources Branch Chief

Submitted by: Chesapeake Bay Detector Dog Program, United States Department of Agriculture (USDA) APHIS Wildlife Services



Photo 1. Chesapeake Bay Detector Dog Team (USDA), Cherry Keller (USFWS) and Fort A.P. Hill staff.

Background:

The Chesapeake Bay Nutria Eradication Project (CBNEP) (Maryland/Delaware/D.C. Wildlife Services, MD/DE/DC WS) was formed in 2002 to eradicate nutria from the Delmarva Peninsula (made up of Delaware and parts of Maryland and Virginia). As nutria removal decreased densities on Delmarva, MD WS developed a suite of

monitoring techniques to increase detection of nutria, including the use of detector dogs. Detector dogs are those trained to find a target odor (such as nutria scat or small whorled pogonia).

MD/DE/DC WS partnered with the USDA-APHIS National Detector Dog Training Center (NDDTC) to train and develop detector dogs to assist in determining the presence/absence of nutria and later feral swine and small whorled pogonia. The NDDTC trains detector canines for various agencies including U.S. Customs and Border Protection and the U.S. Fish and Wildlife Service (USFWS) on targets ranging from agricultural products to contraband wildlife items. Dogs have 300 million olfactory receptors compared to humans 6 million, (Williams 2011) making them much more efficient at searching landscapes to find an odor target than when humans visually search comparable areas. In addition, they also tend to cover more ground than the handlers, effectively multiplying an already impressive search area.

All MD/DE/DC WS detector dog/handler teams are trained and certified by NDDTC. Canines are trained to locate small whorled pogonia and indicate its presence to the handler via sitting near the identified target (i.e., a sit response). Canines are not permitted to interact with wildlife or other animals. The NDDTC tests MD/DE/DC WS canine teams annually to ensure proficiency with both target detection and obedience. In addition, canine teams are evaluated every two weeks during routine training days throughout the year.

In the summer of 2021, USFWS contacted MD/DE/DC WS for use of detector dogs to help determine feasibility of detector dogs surveying for small whorled pogonia (SWP). SWP samples, in the form of dried leaf and capsule specimens, were provided to MD/DE/DC WS in November of 2021 to begin introduction and training. Canines were initially trained inside on new odor using small plastic vials in wood forms. These vials held both target odor and no odor (i.e., blanks). In early 2022, training was moved to outside locations and targets were sealed in plastic membrane tea bags. Both target tea bags and blank tea bags were placed in the environment to prevent false responses. In May of 2022, flagging was added to the environment and all training was conducted in and around flagging as placed in SWP colonies. This was done to desensitize the canines to the flagging that would be present at known SWP colonies.

Management Area:

Surveys were conducted on Fort A.P. Hill in Caroline County VA and on Price William Forest Park in Triangle, VA. During the first weeklong deployment, 2 full days and 2 half days were spent surveying on Fort A.P. Hill. One full day was spent surveying in Prince William Forest Park. All surveys were conducted on known SWP colonies in mixed hardwood forest. The teams returned to Fort A. P. Hill on July 20-22, 2022, to conduct follow up reinforcement surveys with the canines.

Methods:

Four detector dog teams conducted surveys with Fort A.P. Hill and USFWS staff members. During the first deployment, on Monday June 6th, handlers and canines traveled from Cambridge, MD to Fort A.P. Hill and immediately had a safety briefing for base work. Once completed, all teams surveyed two sites that afternoon. One canine/handler team conducted a survey at a time with teams rotating order so that each canine had the opportunity to be the first to conduct a survey in an area. Some SWP populations were immediately adjacent to known large whorled pogonia populations. Canines were intentionally worked through these populations to note if any change/interest occurred. No change was evident in any of the canines.

On Tuesday, June 7th, teams split up into two pairs. Surveys were conducted on Fort A.P. Hill. Every SWP population on Fort A.P. Hill was flagged and some plants had cages in place over the plant. In some areas, blank populations were set up consisting of a flag array with no plants nearby to dissociate the target scent from the flags. In addition, there were flags at most known SWP populations that had a dormant plant or were a corner boundary that acted as blanks. Handlers noticed on day two that the cages presented a challenge in training as the canines could not get close enough to the plants to connect the odor with response. Handlers also noticed that canines worked better when additional people remained outside the SWP population and canines could move and search freely.

On June 8th, all teams traveled to Prince William Forest Park to conduct surveys on SWP populations that were not flagged. All four teams worked the same sites in rotation with only one canine working at any one time. At the beginning of the surveys, a dried target specimen was placed at the base of a live plant to draw the connection between trained odor and live plants for the canines. As hoped, this appeared to increase the canine's efficiency in pinpointing plants.

On June 9th, MD/DE/DC WS once again split up into two teams of pairs and conducted surveys on new locations of Fort A.P. Hill. This day was used to focus on repetition and building on the connection of target odor to live plant.

On June 10th, MD/DE/DC WS remained as one group with all four canine teams and conducted surveys on two SWP populations. Again, only one canine was worked at any time and teams rotated order. This was a half day as the teams left from Fort A.P. Hill to return to Cambridge, MD. Canines needed the least number of assists this day and pinpointed plants much quicker than the beginning of the week.

On July 20th, MD/DE/DC WS traveled to Fort A.P. Hill and arrived near noon. All four teams conducted surveys at the first location and placed target at a known plant for the first survey of the day. Afterwards, teams split into two groups and conducted surveys at three additional sites. Only one canine worked at any one time.

On July 21st, Teams rotated and split into two groups, surveying 5 different sites each for the day. The weather was very hot on both the 20th and 21st, so the canines were given significant breaks between surveys.

On July 22nd, MD/DE/DC WS traveled back to Cambridge, MD. No surveys were conducted.

Results:

MD WS canine teams detected SWP at all known population's sites with above ground SWP. At the beginning of the week, canines needed to be assisted to respond more frequently to draw the connection between trained odor (dried specimens) and live plants. As the week progressed, canines needed less assistance culminating in nearly no assists on the final day of surveys. In addition, canines pinpointed plants much quicker on day five than day one of surveys, indicating a clear progression in survey ability.

Flagging did not appear to be an issue at any sites and only one false response was noted by one canine on day two of operations. This response may have been a handler cue rather than the flagging.

The placement of target odor at the base of live plants on day three appeared to be a turning point for several of the canines. The speed of target acquisition and plant pinpointing increased greatly moving forward after these exercises. In addition, conducting the surveys in populations without flagging or markings may have helped by removing distractions from the exercises.

On the July trip to Fort A.P. Hill, all canines began surveys detecting SWP with no assists. Surveys were conducted on plant populations with cages removed as well as some cages remaining. In some instances, flagging was also removed to help eliminate association. Canines successfully responded on live plants both

caged, flagged, and uncaged and unflagged. In one instance, canine Bradie responded on a flag adjacent to a live SWP with flag. When given the command 'show me' (a command that asks the dog to place its nose close to or on target), Bradie pinpointed the base of the flag with no visible plant. Handler Trevor Michaels asked Brian Josey if there was a senesced plant present. He said, to his knowledge, there was not. Bradie grew visibly and audibly frustrated (barking) while Trevor waited for her to pinpoint a live plant for reward. Eventually, she did go to the adjacent live SWP. Afterwards, close examination revealed a recently senesced plant at the base of the flag she had pinpointed. Writing on the flag also indicated that a plant had been present there within the last month. She had correctly responded and pinpointed the senesced plant.

At another site on day two of the July trip, Amanda Thompson, Carl Dunnock, Trevor Michaels, and canines entered the woods to find a site of known SWP that none of them had been too. During the search, canine Bradie worked ahead and found the SWP site in a creek bottom before it was visible to the team.

Table 1. Summary of effort from 6 June to 10 June 2022 for MD/DE/DC WS canines conducting detector dog (with canine) surveys. Total survey covered 40.43 miles.

Canine Handlers	Number of Surveys	Detector Dog Survey Miles
Benny	11	9.64
Bradie	13	9.95
Encore	12	10.64
Grande	14	10.20

Figure 1. Map of canine Benny and handler Lisa Barry's survey of SWP population on Fort A.P. Hill.



Figure 2. Canine Encore and handler Carl Dunnock conducting surveys on Prince William Forest Park.



Figure 3. Canine Benny and handler Lisa Barry and Trevor Michaels conducting SWP surveys on Fort A.P. Hill



Photo 2. Canine Bradie and handler Trevor Michaels with Amanda Thompson conducting surveys at Fort A.P. Hill



Photo 3. Canine Bradie being rewarded by handler Trevor Michaels for a SWP detection with Jennifer Stanhope USFWS.



Recommendations:

As funding and time permits, future surveys on Fort A.P. Hill, Prince William Forest Park or other suitable locations should be conducted to solidify canine response and survey technique. An additional round of surveys is planned for the fall of 2022 on senesced plants with capsules. This should help to fully round out the canine's ability to detect plants during multiple seasons/life stages. MD/DE/DC WS should also continue to train with dried specimens off site in Cambridge, MD. If possible, live, or fresh frozen specimens would be beneficial to add to training exercises. Canines have been validated on dried specimens, but as previously noted live plants in a wild setting present a unique situation to the canines that can not be exactly replicated in a off site training exercise. For the strongest survey ability, canines should be trained on a mixture of offsite and known populations.

Surveys conducted in varying locations (Virginia, New Jersey, etc) may also be beneficial on solidifying the canine detection ability. Canines are now validated on SWP and showing excellent progression. It is our recommendation that teams could begin to conduct surveys for unknown SWP populations this upcoming growing season. It would be beneficial to be able to integrate known populations, if possible, with unknown populations surveys.

Conclusions

CBNEP is grateful for the opportunity to work with staff at Fort A.P. Hill, Prince William Forest Park and USFWS. Canines showed proficiency at detecting SWP in known populations settings. There were some plant casualties due to dogs or handlers unintentionally trampling a plant. Efforts should be made to continue to minimize any risk to the plants while still maintaining dog proficiency. As the canines improve, it should be possible to have them respond (sit) further from the target source (plant). With continued exposure to both live plants and training materials, canine teams will only increase proficiency and expand their survey capabilities. Once field trained, possible suitable survey locations for canine teams should be mapped based on habitat and/or historic presence. Additional questions should be directed to District Supervisor, Trevor Michaels at 443-205-2726 or trevor.a.michaels@usda.gov.

Literature Cited

Williams, C. (2011). "Animal supersenses: Smell-o-Vision, the dog way." New Scientist **211**(2826): 36-37.