Update On Game Lands 33 and Green Lane Research

By Kristin Wild, Asplundh Tree Expert Co.

Current three-year research plan, established in 2015, for the State Game Lands 33 (SGL 33) and Green Lane right-of-way (ROW) management projects is on track and making good progress according to Professor of Biology and Environmental Studies Dr. Carolyn Mahan of the Pennsylvania State University. She is the research leader for both projects. The SGL 33 site in central Pennsylvania has been continuously studied since 1953. The Green Lane project, started in 1987, is located on a PECO ROW in the southeastern part of the state. Read on for highlights of the team's work this summer.

Focusing on the Birds and the Bees

Collecting bird and pollinator data, as well as plant diversity, was the primary focus of this year's field work. Penn State Biology Instructor/Research Assistant Brad Ross and undergraduate student John Berger found and monitored 50 songbird nests this year at SGL 33. The most common species nesting on the FirstEnergy/Penelec ROW, that crosses SGL 33, was the chestnut-sided warbler, which requires early successional habitat for nesting. The most notable species found nesting on the ROW (border zone) was a black-billed cuckoo.

In partnership with Research Technician Dana Roberts and Postdoctoral Scholar Laura Russo from the Penn State Center for Pollinator Research, Hymenopteran pollinators (bees, in particular) were collected on all SGL 33 treatment sites in May, June, July, and August of 2016. Pollinator collecting also provided field research opportunities for three Penn State students—Zach Holden, Dustin Keefer, and Mallory Herald.

All of the collected bees are now stored at the Frost Entomological Museum at the University Park campus. Museum preparation—pinning

In a cedar waxwing nest, found in one of the mowing transects on the SGL 33 site, three chicks are shown here looking for their next meal. In May and June of 2016, four singing surveys were conducted at both SGL 33 and the Green Lane sites. These were followed by productivity and nest monitoring at SGL 33 only. Data collection at the Green Lane site is now limited to singing surveys and plant diversity work due to various land-use factors that are interfering with the effects of ROW management on wildlife there.

and identification—was done in conjunction with Museum Curator Andy Deans.

In addition to the birds and the bees, Dr. Mahan and Research Assistants Rich Yahner and Brad Ross identified the plants growing in each of the 12 research plots at both the

SGL 33 and Green Lane sites. The species and stem-count data were collected in July when the plants are more fully formed, in order to capture the highest potential plant diversity. This timing change is part of the three-year research plan for SGL 33 and Green Lane.

Tying it All Together with Mapping

Dr. Mahan and her team are now working with Penn State Altoona Geography Professor Tim Dolney to

Pollinator surveys and collecting were conducted four times during the summer. Because research shows that native pollinator abundance and diversity is positively correlated to vegetation diversity, the plant identification and measurement work was performed in July, instead of May, in order to capture the highest potential plant diversity at the sites.

(Top left) In May of 2016, this bee of the Andrena genus, a ground nester, was one of dozens of bees gathering nectar and pollen from a blossoming pin cherry (Prunus pensylvanica) on the #4 sample plot (low-volume basal) at the SGL 33 site.

(Top right) Dave Krause of Arborchem Products Division and Phil Brumbaugh of FirstEnergy/Penelec oversaw four days of vegetation management (VM) work on the SGL 33 ROW in August. A crew from the Wes Turner Region under General Foreperson Darrell Thomas carefully performed six different treatments on 12 research plots (two replications of each). The treatment methods were hand cutting, low volume basal bark, ultra low volume (ULV) foliar, high volume foliar, mowing, and mowing plus cut stubble herbicide.

prepare a Geographical Information System (GIS) map for the SGL 33 project. Global Positioning System (GPS) coordinates were collected for the corners of each treatment site during the plant diversity work that took place in the summer of 2016. As the maps are prepared, the treatment sites will be linked to the vegetation, bird, and pollinator data sets.

Speaking of data sets, the next stage of work for the research team will focus on data entry and preparing updates to the website hosted by Penn State at *sites.psu.edu /transmissionlineecology*.

Sharing the research results with interested stakeholders online and in person is a vital part of Dr. Mahan's three-year plan. In fact, she is scheduled to make a presentation at the annual Appalachian Vegetation Management conference in Stonewall Jackson State Park in West Virginia in March 2017 and other opportunities will be announced. Stay tuned for further updates on the "birds and bees" research that will provide information to help us manage ROWs in an environmentally and economically sustainable way.

(Left) For decades, each treatment plot on SGL 33 and Green Lane has been indicated on a paper or electronic scan of a map and marked with wooden stakes like this one. To electronically connect the plant, bird, and bee data to each treatment plot, GPS coordinates for the corners of each plot were collected this year to create a GIS map.