



## 2017 Conservation Work Summary



Prepared by: Mike DiLello, Conservation Manager

## INTRODUCTION

The Farm at Sunnyside is a 422-acre property located in Rappahannock County, Virginia along the border of Shenandoah National Park. In addition to being a producer of certified organic vegetables and fruit (see [www.thefarmatsunnyside.com](http://www.thefarmatsunnyside.com)), Sunnyside maintains an active conservation program that seeks to manage the non-agricultural portions of the farm for beneficial ecological services (water quality, natural pest control, pollination, carbon storage, etc.) and for native biodiversity. We also carefully monitor biotic and abiotic environmental conditions to inform our actions and to detect longer term trends. Finally, we actively partner with a variety of external organizations to share lessons learned and encourage efforts to more sustainably manage private lands. We employ a full-time conservation manager to carry out these tasks. After six years in this position, Sam Quinn left the farm at the end of 2016 for a teaching opportunity at the SUNY School of Environmental Science and Forestry in Syracuse. The farm welcomed Mike DiLello as our new conservation manager in January. Mike brings extensive experience with federal, state and municipal land management agencies working on trail construction, invasive species control and habitat restoration. This report represents a snapshot of Mike's 2017 work.



Figure 1. New Conservation Manager, Michael DiLello

## CONSERVATION MANAGEMENT

### Native Meadows

Converting monoculture fescue pastures into meadows planted with native grasses and wildflowers has been a cornerstone of the farm's conservation efforts. With three new meadows added this year, the farm now dedicates 57 acres to land use. These meadows provide excellent wildlife habitat (especially for pollinators and songbirds), enhance water quality, store carbon and reduce maintenance costs. Prescribed burning is the



this

Figure 2. Controlled burn in Tall Grass Meadow

primary management tool, although grazing, discing and mowing are occasionally used.

### 2017 Highlights

- Seeded three new meadows covering 17 total acres using a diverse mix of grasses and forbs;
- Suppressed weeds (primarily marehail, stink grass and carpet weed) in the new meadows through regular mowing;
- Burned two meadows during the growing season (as opposed to our usual practice of burning in February or March);
- Flail-mowed one meadow (6.8 acres) in early spring;
- Experimented over the summer with a front-mounted brush cutter to mimic grazing disturbance;
- Spot-treated for invasive plants.

### **Invasive Species**

A limited number of exotic, invasive plants pose a significant threat to the farm's goals of managing for diversity, resilience and beneficial environmental services. That's because these plants outcompete native species and can quickly turn a diverse habitat mosaic into a monoculture. These plants thrive in disturbed landscapes such as those found at the farm, where centuries of agricultural use (primarily cattle and orchards) created a perfect environment for invasion. Managing them effectively is one of the major challenges and most time-consuming elements of the conservation program. Our strategy is to: (1) focus narrowly on those species that pose the greatest threats; (2) conduct regular surveillance to detect new infestations before they spread; (3) aggressively treat existing invasives using the most efficient, effective and sustainable means possible; and (4) follow up rigorously to prevent recurrences. Given that part of the property operates as a certified organic farm, extensive precautions are taken in relation to herbicide treatments - e.g., materials are stored and mixed separately from all farm equipment; tanks, backpack sprayers and other means of delivery are never comingled with those used for farming; herbicides are applied



Figure 3. Manual removal of mile-a-minute vine, including bagging of seeds

conservatively, always at a safe distance from all growing areas and water sources and only when appropriate weather conditions exist.

### 2017 Highlights

- Experimented with different timing and control strategies, e.g. more “shoulder season” removal of Japanese honeysuckle, manual pulling of mile-a-minute vine with bagging of seeds; and use of a front-mounted brush cutter to shred large pockets of Chinese privet, multiflora rose and Japanese honeysuckle.
- Created a GIS database pinpointing the precise location of invasive species detections to better prioritize work and ensure effective follow-up.



Figure 4. Prepping new treatment area

## Artificial Nest Boxes

The farm has installed artificial nest boxes for selected bird species that either face conservation challenges and/or provide important ecological services (particularly through direct predation on agricultural pests). These species include barn owls, Eastern screech owls, American kestrels, wood ducks, purple martins, tree swallows and Eastern bluebirds. We track nesting success for all species and participate in broader regional banding programs for kestrels and barn owls.

### 2017 Highlights

- Fledged our first brood of barn owls and successfully banded four chicks;
- Fledged our first brood of eight wood ducks;
- Installed stovepipe baffles on all our bluebird/swallow boxes and had our best year ever in terms of number of birds fledged.
- Installed a purple martin nest box colony but had no success attracting birds this season.

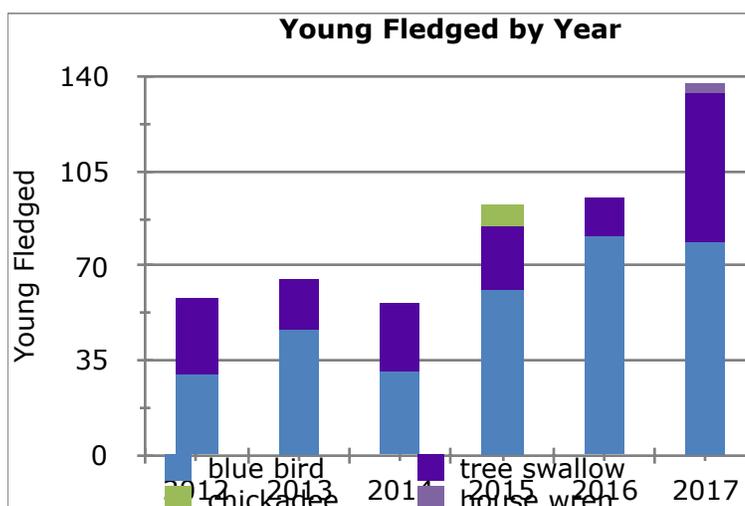


Figure 5. - Bluebird and tree swallow fledglings by year



Figure 6. Banded barn owl



Figure 7. Kestrel chicks in artificial nest box

## Trail Construction and Maintenance

Establishing and maintaining a comprehensive system of trails serves the dual purposes of allowing access to more remote parts of the property for management (invasive species control, fire containment, etc.) and providing enhanced opportunities for recreation and wildlife observation.

### 2017 Highlights

- Two new farm trails constructed using sustainable methods (e.g., grades not exceeding 8%, grade reversals, excavated soil spread downslope, elevated stream crossings, etc.);
- Design of two new trails completed with construction planned for 2018.



Figure 8. Constructing new forest trail

## Wild Product Harvesting



Figure 9. Map of trails constructed in 2017

Sunnyside sustainably harvests certain wild products from the property to augment our agriculture operation, offset the costs of the conservation program and educate people about the value of biodiversity to food production. Wild products include paw paws, spicebush berries and native wildflowers. Sunnyside also keeps an apiary for honey and to aid with crop pollination. Though honeybees are a non-native species, they are naturalized to the property and do not appear to disrupt native bees and other pollinators.

### 2017 Highlights

- Harvested spicebush berries and paw paws for sale through the farm's retail channels (farmers' markets and a community supported agriculture program).
- Installed 6 new bee colonies, harvested about 200 pounds of honey; and treated for varroa mites;



Figure 10. Installing new honeybee colonies

## MONITORING

### Camera Trapping

The farm uses remote cameras to capture images of wildlife not otherwise easily seen. We do so to learn more about how key species - black bear, bobcat, coyote, gray fox, white-tailed deer, etc. - use the property, to record the presence of new species and to develop a database from which to assess changes over time. Cameras are placed along game trails, stone walls, stream corridors and other areas of high activity. We also place cameras on the remains of deer killed by an individual who hunts on the farm. We do not allow lead ammunition at Sunnyside, and these images provide evidence of just how many different mammals and birds will scavenge "gutpiles." By sharing these photos, we hope to help convey the critical importance of switching to non-toxic bullets. Lead poisoning is a primary source of mortality for bald eagles, ravens and other species that we frequently document.



Figure 11. Darker version of eastern coyote (left) vs. standard eastern coyote (right)

### 2017 Highlights

- Unusual coyote variant recorded displaying shorter, more rounded ears, a less elongated nose and a much darker overall coloration;
- First record of Allegheny wood rat, a species of concern in the state of Virginia;
- Wide variety of species feeding on gutpiles; additional behaviors documented using new trailcam capable of shooting 4k video.



Figure 12. New species of concern on the Farm - Allegheny woodrat

### **Streams & Soils**

Water quality and soil health are fundamental to Sunnyside's long-term management objectives. We seek to monitor each carefully.

### 2017 Highlights

- Continued regular monitoring of stream salamanders across seven sites on two streams. Stream salamanders are sensitive to fluctuations in the environment, easy to sample and abundant enough to provide statistically meaningful data.
- Continued taking regular measurements for temperature, pH, conductivity, total dissolved solids and salinity in the farm's ponds.
- Established three soil erosion bridges, devices that allow measurement of soil movement, in vegetable fields and warm season grass meadows. We intend to extrapolate the

measurements to estimate the displacement of soil across a larger area. This data will allow us to assess the effectiveness of our management practices.

## Weather

Sunnyside maintains a research-quality weather station that records temperature, precipitation, humidity, wind speed/direction and other information. Current weather conditions can be found on the farm website while weather station data is stored and used to inform decision-making and to detect longer term trends.

### 2017 Highlights

- While total precipitation was near normal, we received it very episodically.
- The farm picked up 32% of its annual rainfall (over 13") in May alone.
- January, February, March and April were all abnormally warm and relatively dry.
- An exceptional October wind event associated with a dry frontal passage destroyed a number of large trees, including two of only three known pecan trees on the property.



Figure 13. Downed pecan tree from high winds

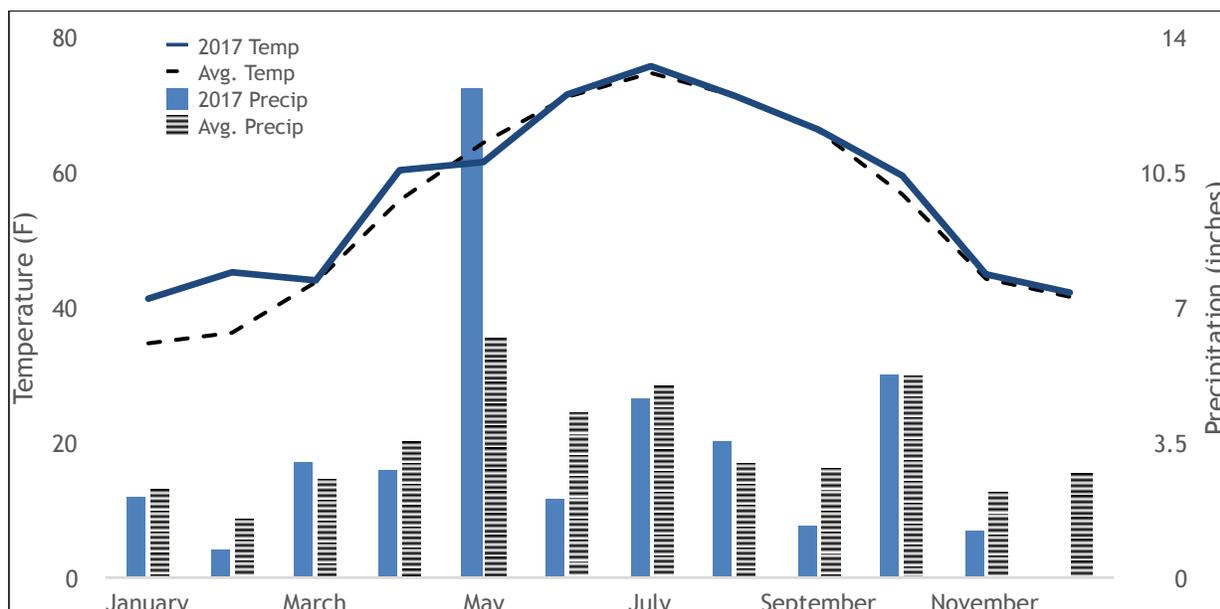


Figure 14. Weather data from 2017 compared to

## PUBLIC OUTREACH

Sunnyside partners with external organizations and individuals to assist us in implementing our conservation program, share lessons learned and encourage other private lands conservation efforts.

### 2017 Highlights

- [Blue Ridge Partnership for Invasive Species Management \(PRISM\)](#). Sunnyside participates actively in this cooperative weed management collaboration that unites landowners, state and federal partners, corporations and others in an effort to address invasive species at a regional level.
- [Piedmont Environmental Council \(PEC\)](#). Sunnyside hosted a restoration workshop over the summer in partnership with PEC. About 12 interested landowners came out to the farm for a tour co-led by Mike and PEC's Wildlife Habitat Specialist. We focused on invasive species control, native meadow establishment and management of specific habitats for desired wildlife.
- [Smithsonian Conservation Biology Institute \(SCBI\)](#). Each semester we offer a practicum experience to students from the Smithsonian-Mason School of Conservation. In 2017, we had 4 young adults assist with invasive species control, soil erosion prevention and honeybee management. We also remain an active participant in SCBI's [Virginia Working Landscapes Initiative](#).
- [Old Rag Master Naturalists \(ORMN\)](#). Sunnyside participates in the North American Butterfly Association's annual butterfly count sponsored in Rappahannock County by ORMN. Another intrepid group of butterfly observers visited the farm during one of the summer's hottest days to conduct this year's count.
- [Culpeper Soil and Water Conservation District \(CSWCD\)](#). The farm was honored

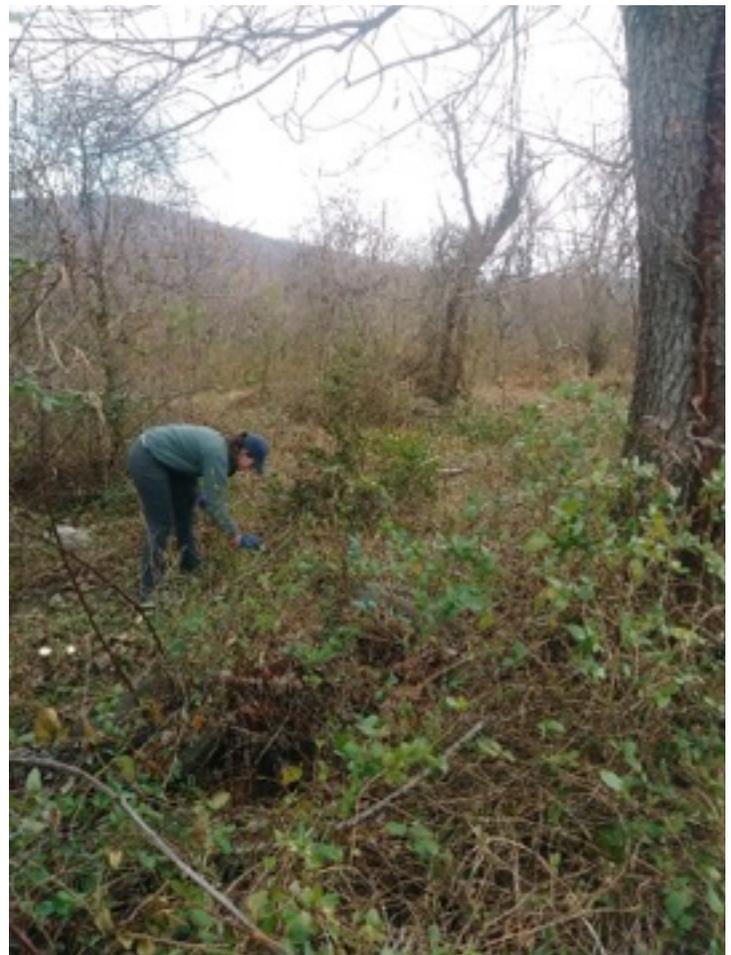


Figure 15. SMSC student treating Chinese privet stumps

this year to receive the Rappahannock Clean Water Award presented annually by CSWCD to a property that has taken exceptional measures to enhance water quality.