MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

RESEARCH SUMMARY

Evaluating Integrated Roadside Vegetation Management (IRVM) Techniques to Improve Pollinator Habitat

WHAT WAS THE NEED?

Recent national initiatives are addressing the 'pollination crisis' by restoring or enhancing native meadows and grasslands. Subsequently there has been an increased interest in early successional landscapes created through management of transportation rights-of-way. National roadways in the U.S. have an estimated habitat potential of 10 million acres. Roadsides not only cover extensive acreage but also provide connectivity in a fragmented landscape and traverse multiple habitats, making them particularly important for wildlife conservation.

WHAT WAS THE GOAL?

In an effort to improve roadside habitat for pollinators this three-year field study had two main goals: to determine which vegetation management tactics best maximize quality floral resources for pollinators in the Northeast, and to assess how those different

AUGUST 2019

REPORT NUMBER:
MD-19-SHA/UM/4-38

START DATE:
December 6, 2016

COMPLETION DATE:
June 28, 2019

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regimes affect regional bee populations. Three roadside vegetation tactics were evaluated in this study: selective herbicide use (SH), annual fall mow (fall mow), and the traditional mowing (turf) regime.

WHAT DID THE RESEARCH TEAM DO?

Six roadside sites were established in Frederick and Carroll Counties in spring 2016. Sites 1 - 4 are located along US 15/Catoctin Mountain Highway, while sites 5 and 6 are on MD 194/Woodsboro Pike. Collectively sites 1 - 6 cover an area with a radius of ~ 24 km, are in the U.S. Department of Agriculture's plant hardiness zones 6a, 6b and 7a, and have an average annual precipitation of 103.1 cm. The six sites were .8 km ≥ apart. Each is divided into 2 - 3 treatment plots (SH, fall mow, and turf) of approximately equal acreage, ranging from .6 – 1.8 acres. The research team measured effects of three vegetation management regimes on floral resource availability for pollinators, and compared roadside bee communities, including wild and managed bees.

Bee and vegetation monitoring were conducted approximately every 30 days during the entirety of the growing season (late spring – mid fall). Bees were collected via three commonly used monitoring methods (pan trapping, hand netting and an observational approach). Floral resource availability was determined using several techniques recommended for pollinator habitat assessments: scanning (flowering species for the entire plot were recorded and ranked according to perceived abundances) and fixed quadrat (2 m x 2 m) floral counts.

WHAT WAS THE OUTCOME?

The first major conclusion of this study is that treatment is a significant predictor of floral abundance and diversity, expressed via the Shannon's biodiversity index, a quantitative index that takes into account the number of species and how evenly those species are distributed in a given habitat. The second finding is that the sole significant predictor of bee species diversity is site or surrounding landscape, while treatment is a significant predictor of bee abundance. While the mean differences between the two IRVM treatments, SH and fall mow, was not significant, both techniques resulted in statistically significant increases in floral diversity and bee abundance. Both IRVM treatments showed similar potential at increasing floral resources to support pollinators.

HOW WILL SHA USE THE RESULTS?

Data from this study supports the hypothesis that MDOT SHA's transition from frequent mowing to a fall mow and/or SH regime can benefit bees and other pollinators.

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