

2018 Annual Report: Survey for Brown Marmorated Stink Bug in the Southern Appalachian Mountains

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The purpose of this study was to better understand the occurrence of brown marmorated stink bug (BMSB, *Halyomorpha halys* Stål) at different elevations in the southern Appalachian Mountains.

It has been well established that wooded areas are important reservoirs of BMSB, and that BMSB are frequently observed on a variety of native and non-native woody plants (Bakken et al. 2015, Bergmann et al. 2016, Acebes-Doria et al. 2016). However, most studies have been conducted at middle to low elevations (i.e., 3000 ft/1067 m and below) and along forest edges near structures or agricultural fields. It is not clear whether BMSB can survive and/or reproduce at higher elevations and in areas where forests are the predominant habitat.

Materials and Methods

Four STKY Dual Panel Adhesive Traps with BMSB Dual Lures (Trécé, Inc., Adair, OK) were mounted on 4-ft tomato stakes and placed at four different elevations along the Blue Ridge Parkway south of Asheville, NC (Map 1 and Figure 1). Specific sites at roughly 1000 ft (305 m) intervals were chosen primarily for practical reasons, such as having a suitable place to pull off the roadway and being out of public view. Surrounding habitat varied, and trees and shrubs within a 20m radius of each trap were recorded (Table 1). According to nearby weather stations, average temperature at the lowest and highest elevations was 64.8°F (18.2°C) and 56.9°F (13.8°C), respectively, and total precipitation was 54.6 in (138.7 cm) and 58.2 in (147.8 cm), respectively.

Traps were checked at intervals of 7 to 26 days and adhesive panels were replaced as needed. All stink bug species were recorded and all BMSB adults were identified as male or female. Traps were removed when captures dropped to negligible levels.

Results and Discussion

This was an informal study and trapping sites were not replicated, thus preventing a statistical analysis and definitive conclusions. However, the four traps revealed some interesting trends. The two lowest traps captured by far the highest number of stink bugs (BMSB as well as other species) over the course of the season (Table 2). The French Broad site (2100 ft/640 m) captured a total of 36 adult BMSB and the Sleepy Gap site (3000 ft/914 m) captured 59, compared to only 3 adults captured at the Fork Mountain site (3900 ft/1189 m) and 0 at Pisgah Inn (4950 ft/1509 m). There were very few nymphs captured in any of the traps, although the capture of 1 nymph at Fork Mountain was interesting, suggesting that reproduction had occurred at the 3900 ft/1189 m elevation. Populations generally followed the established pattern for the

area, with bugs appearing in mid-May and peaking from late August through early October (Figure 2).

Of the 23 “other” stink bugs captured, 15 were harlequin bugs (*Murgantia histrionica* Hahn), 5 were jade stink bugs (*Banasa euchlora* Say), 1 was green stink bug (*Acrosternum hilare* Say), and 2 were unidentifiable.

Although the traps were intended to attract stink bugs from surrounding forest, the proximity of vehicles and structures on the Parkway cannot be ignored. It is possible that an unknown percentage of the stink bugs captured were “hitchhikers” from stopped vehicles or had overwintered in nearby structures. However, our limited data suggest that this was not a significant factor. Although the two lower sites (with the highest captures) were near (<100 m) parking areas with moderate visitor traffic, the highest site (with zero captures) was near the Pisgah Inn and Mount Pisgah campground (400 m and 250 m away, respectively), which both have intense visitor traffic. As BMSB adults are capable of traveling 2000 to 6000 m per day (Lee and Leskey, 2015), it seems very likely that at least one adult would have been captured by our highest trap if nearby visitor activity had been a significant source of bugs.

Additional, replicated trapping studies are needed to determine if this study’s results are representative. A greater number of sampling sites, encompassing a variety of host species, would also help determine whether elevation-dependent differences in BMSB populations are due to variations in climate, proximity to human activities, or differences in forest composition. It would also be interesting to place traps all the way to the 6500-ft level in order to survey BMSB at the highest possible elevations in the southern Appalachian Mountains.

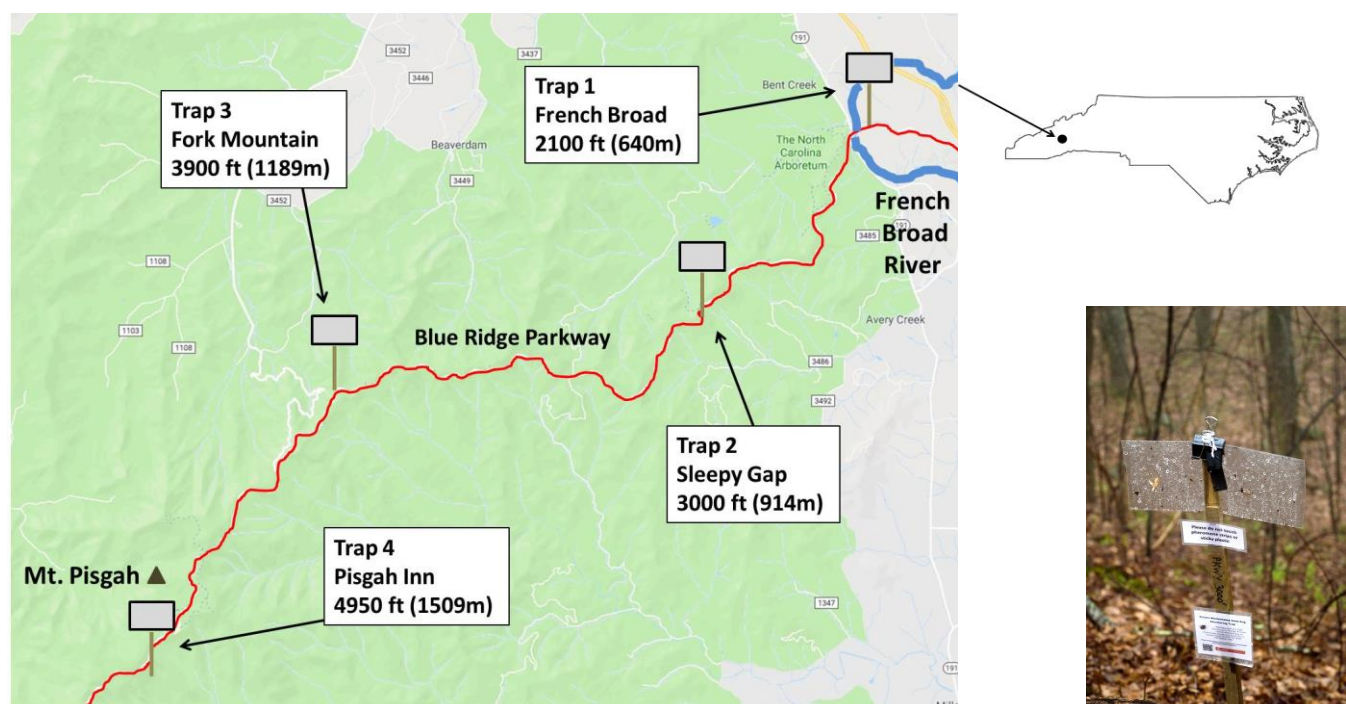


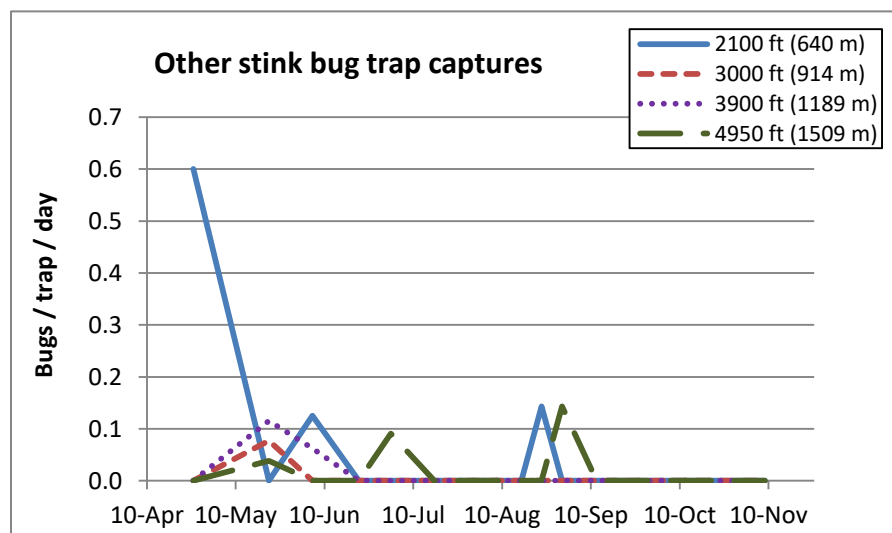
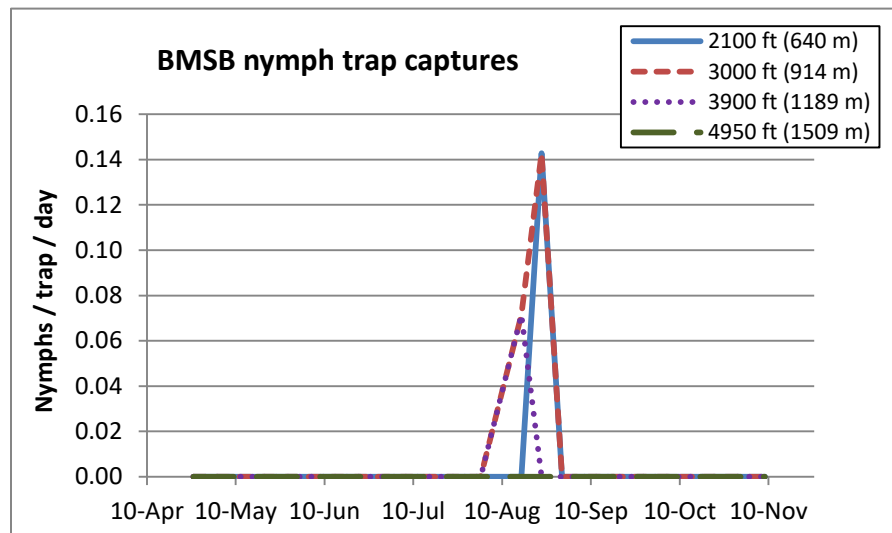
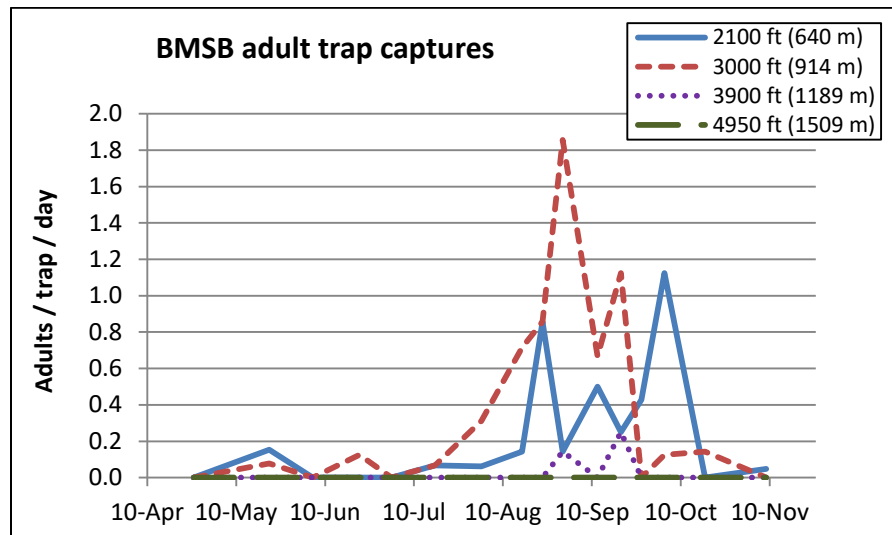
Table 1. Woody species around BMSB traps, Blue Ridge Parkway south of Asheville, NC. 2018.

Trap	Elevation	Nearest milepost	Surrounding woody plants (20m)
(1) French Broad	2100ft (640m)	393	Cherry (x5), holly (x2), tulip poplar, beech, maple
(2) Sleepy Gap	3000ft (914m)	398	Maple (x4), tulip poplar (x3), birch, sourwood
(3) Fork Mountain	3900ft (1189m)	404	Birch (x5), tulip poplar (x3), ash, maple
(4) Pisgah Inn	4950ft (1509m)	409	Locust (x6), rhododendron, mtn laurel, ash, oak

Table 2. Season total stink bug trap captures at different elevations, Blue Ridge Parkway south of Asheville, NC. 2018.

Trap	Elevation	BMSB			Other stink bugs
		Adult males	Adult females	Nymphs	
(1) French Broad	2100ft (640m)	13	23	1	13
(2) Sleepy Gap	3000ft (914m)	24	35	2	2
(3) Fork Mountain	3900ft (1189m)	3	0	1	4
(4) Pisgah Inn	4950ft (1509m)	0	0	0	4

Fig 2. Trap captures along the Blue Ridge Parkway, NC. 2018.



References

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