



Tamarisk Leaf Beetle Monitoring: 2016 Supplemental Report

May – August 2016

Introduction

BEMP has been conducting tamarisk leaf beetle monitoring along a roughly 260-mile stretch of the Rio Grande since 2013 (Figure 1). We expanded our efforts in 2016 to include a greater number of our permanent monitoring sites. Our monitoring objectives are to track the geographic distribution and abundance of the tamarisk leaf beetle and other non-native tamarisk specialists, and the timing and extent of tamarisk/saltcedar defoliation (Picture 1) and refoliation. In combination with our other ecological datasets, the tamarisk leaf beetle dataset will allow us to analyze other systemic changes, particularly any shifts in native and exotic cover that may occur due to the beetle's activity. Our aim is to provide land managers with data that will allow them to evaluate any ecological changes the species may cause in the Middle Rio Grande Valley.

Methods

In 2016, BEMP conducted tamarisk leaf beetle monitoring at every permanent BEMP site containing tamarisk for a total of 27 of 32 sites. As in past years, we continued to use adapted Tamarisk Coalition protocols. For an in-depth overview of these methods, please consult our 2015 tamarisk beetle monitoring report (BEMP 2015), available at our website www.bemp.org. In 2016, we adapted our protocol slightly in order to include a larger number of sites in our sampling: if a sufficient number of tamarisk were not present within the boundary of a particular site, tamarisk within close proximity to a site (e.g., along levees, by the river) were sampled so that number of trees sampled was consistent across sites.



Picture 1: Example of defoliation over the course of a field season. From left to right, June, July, and August at the Rio Grande Nature Center BEMP site in 2015.



Results & Discussion

In 2013, 22 of the BEMP sites were sampled for tamarisk leaf beetle presence and abundance (Figure 1); in 2014 and 2015, 16 sites were sampled (Figures 2 & 3). In 2016, only three out of the 27 sites with tamarisk present did not have the tamarisk leaf beetle present (Figure 4). By looking at the presence and abundance maps (Figures 1-4), the changing distribution of the tamarisk leaf beetle (*Diorhabda*) can easily be tracked. In 2013, the highest numbers (between 200-600 per BEMP site) were found north of Albuquerque, or in the northern parts of Albuquerque (Figure 1). *Diorhabda* were either absent or found in low numbers at the Los Lunas and Belen sites, and were absent in Sevilleta and Lemitar, approximately 70 miles south of Albuquerque (Figure 1). The year 2014 showed very similar trends in abundance and presence distribution (Figure 2), but by 2015 the northern sites had fewer beetles present and the larger numbers were found in southern Albuquerque. Similarly, there were also low numbers in the Belen sites and still no beetles present at Sevilleta and Lemitar (Figure 3). By 2016, the beetles were found in low to moderate numbers in Albuquerque, in moderate to high numbers in Belen, and were present in low to moderate numbers in Sevilleta and Lemitar (Figures 4 & 5). Although no *Diorhabda* have been found on the BEMP site at Mesilla, in Las Cruces, they have been found off the BEMP site in that area.

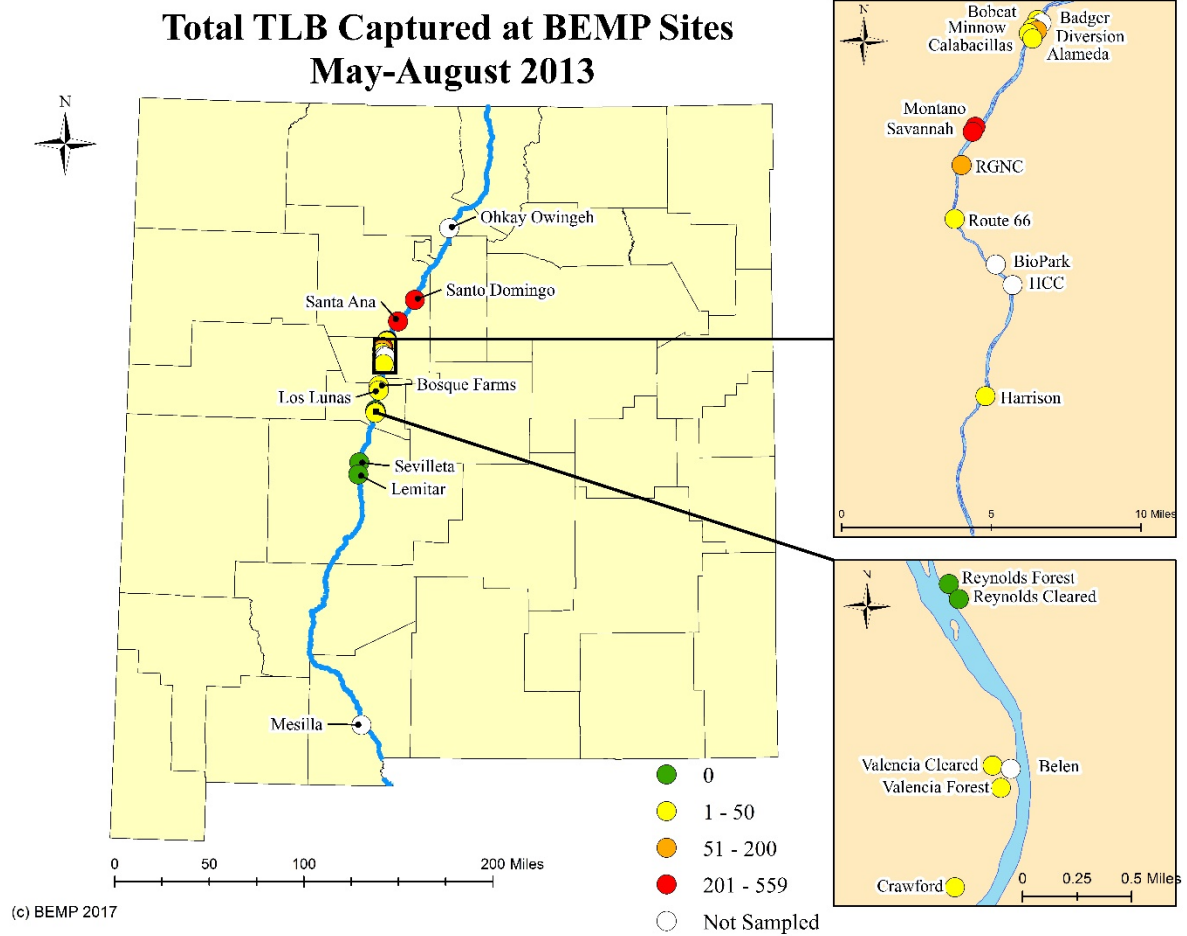


Figure 1. 2013 map of tamarisk leaf beetle (TLB) presence and abundance.

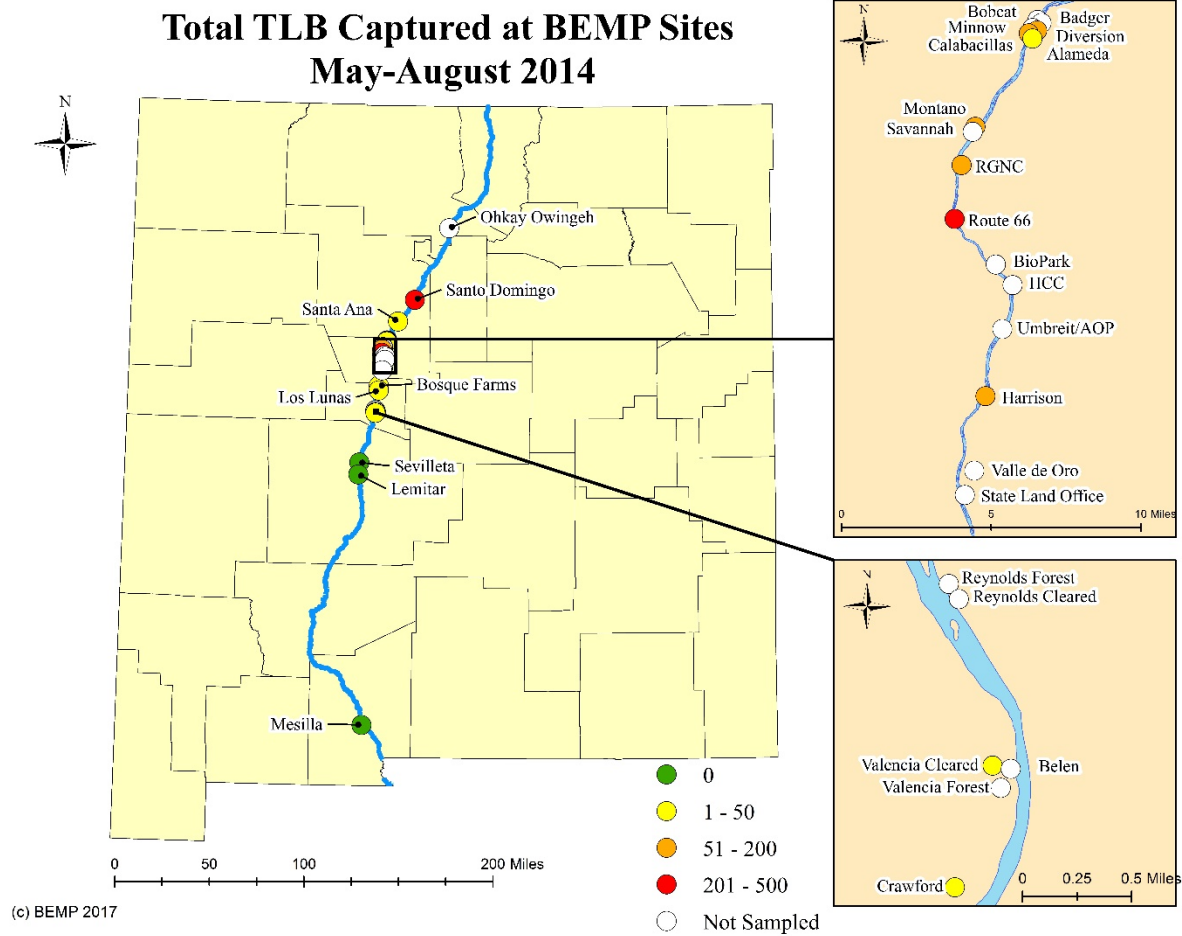


Figure 2. 2014 map of tamarisk leaf beetle (TLB) presence and abundance.

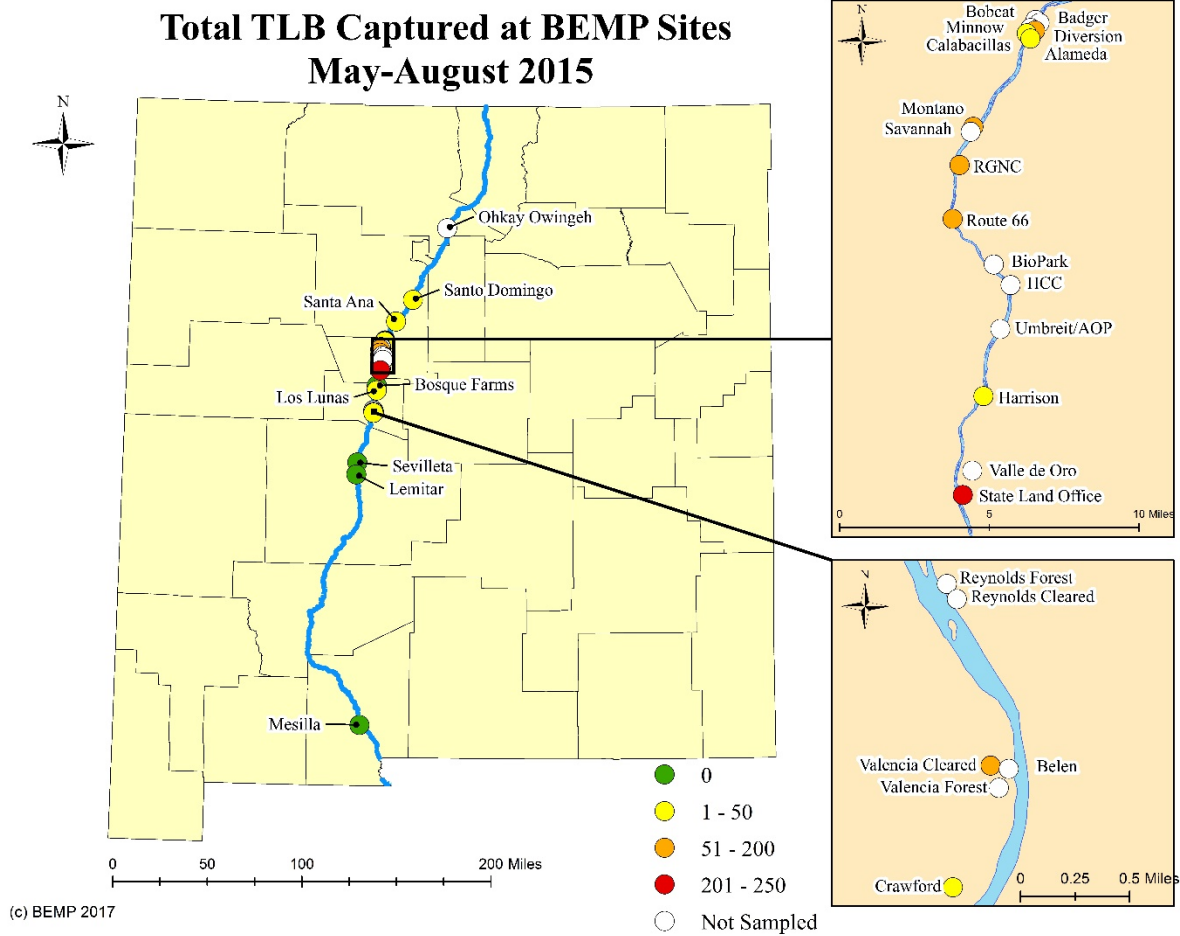


Figure 3. 2015 map of tamarisk leaf beetle (TLB) presence and abundance.

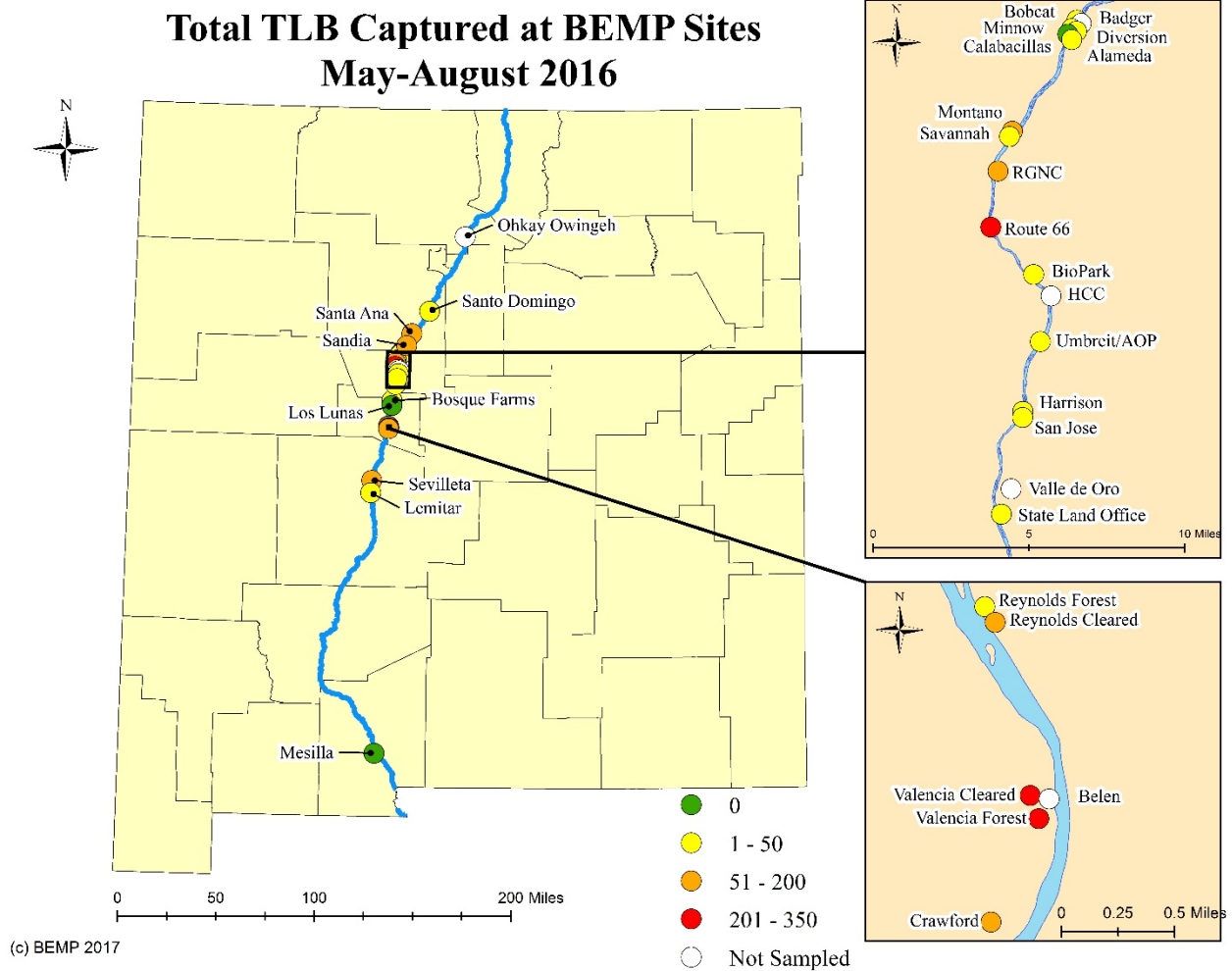


Figure 4. 2016 map of tamarisk leaf beetle (TLB) presence and abundance.

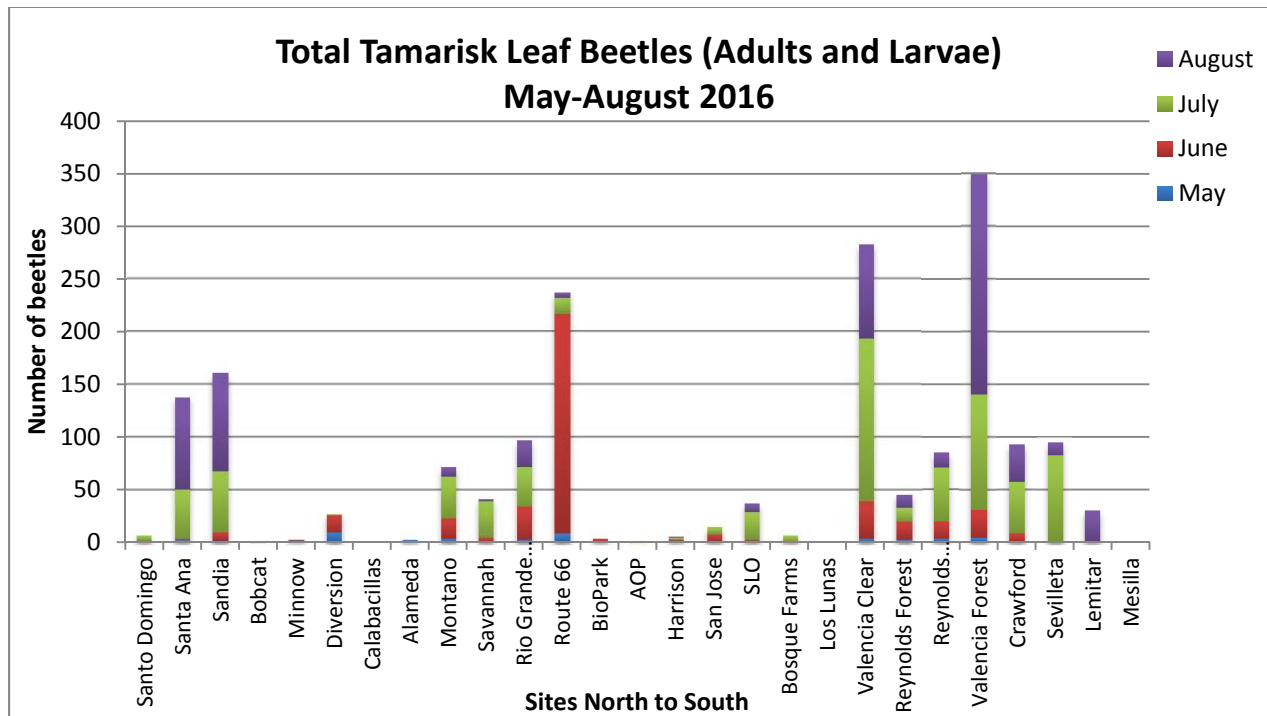


Figure 5. Total *Diorhabda* numbers per BEMP site during each sampling month.

Preliminary data show that in spite of the introduction of the tamarisk leaf beetle and damage done to saltcedar in the bosque, saltcedar cover tends to recover after the initial decrease (Figure 6). Visual response is noticeable, and continued monitoring will indicate the efficacy of the beetle in controlling saltcedar.

Sampling of the other dominant tamarisk defoliators, the splendid tamarisk weevil (*Coniatus splendidulus*) and the tamarisk leafhopper (*Opsius stactogalus*), show that the leafhopper tends to have the greatest abundance, though *Diorhabda* numbers were higher in July (Figure 7). Adult *Diorhabda* are dominant in May (when they first emerge) and in August, with larval stages dominating in mid-summer (Figure 8).

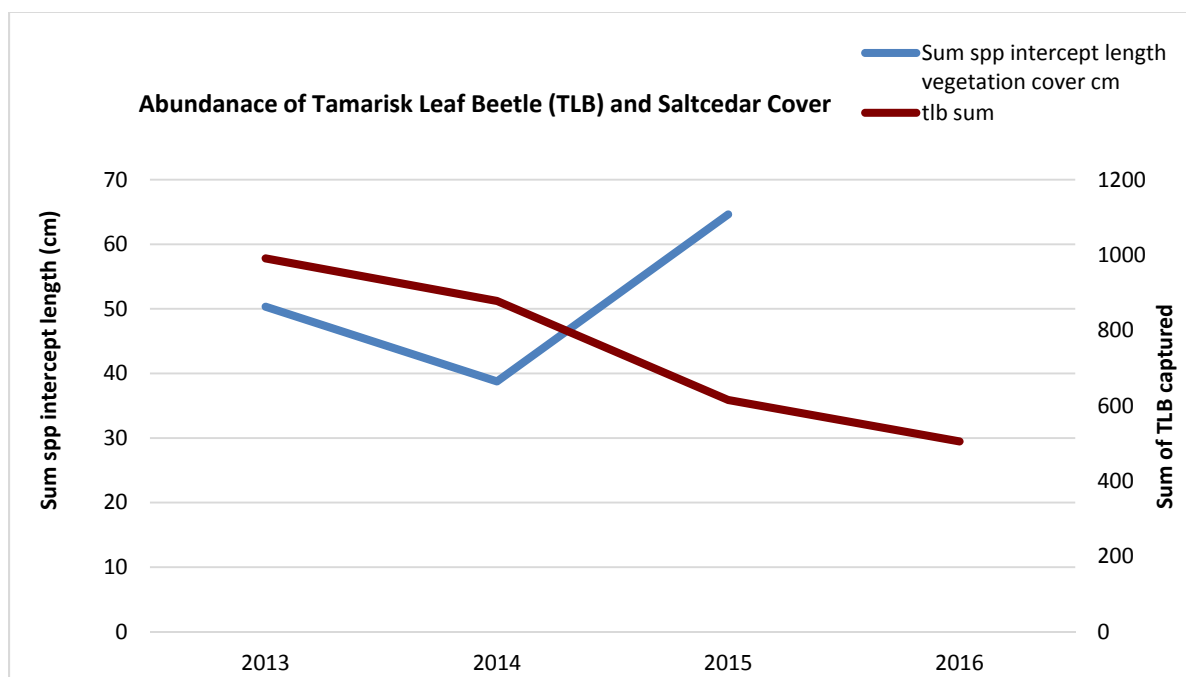


Figure 6. Abundance of tamarisk leaf beetle (TLB) and saltcedar cover from vegetation transects at BEMP sites.

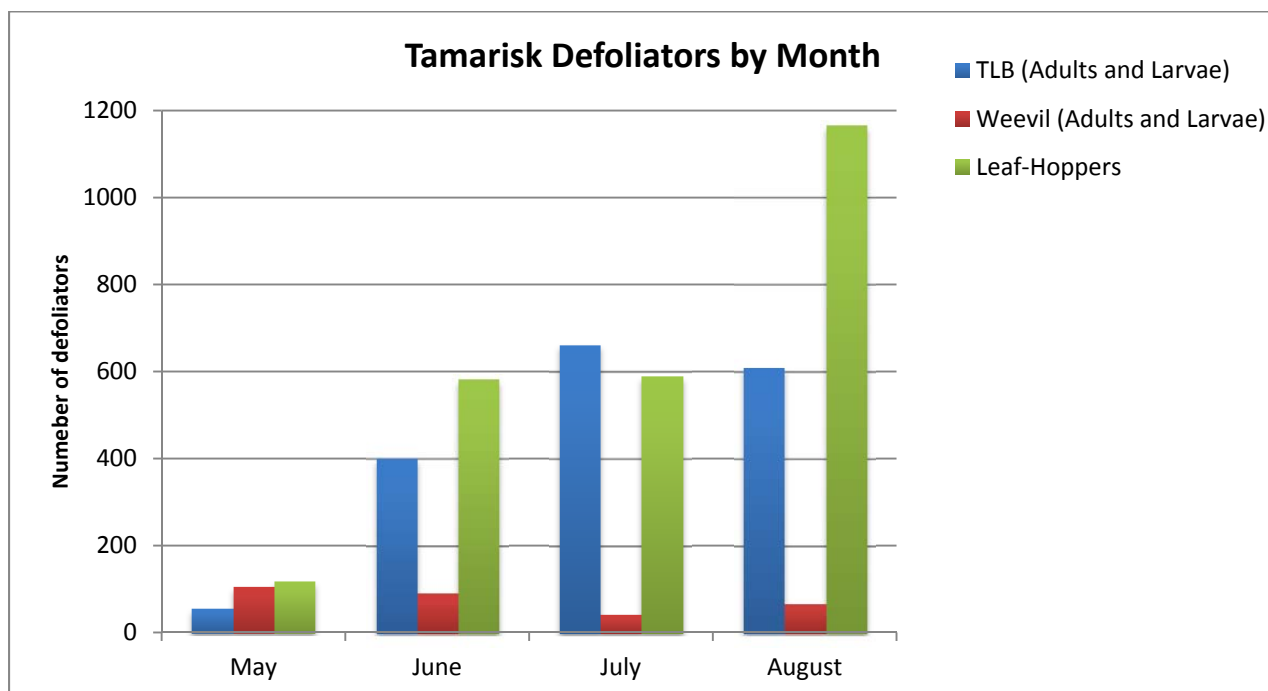


Figure 7. Total number of saltcedar-specific defoliators (tamarisk leaf beetles (TLB), splendid weevils, and leaf-hoppers) by month in 2016.

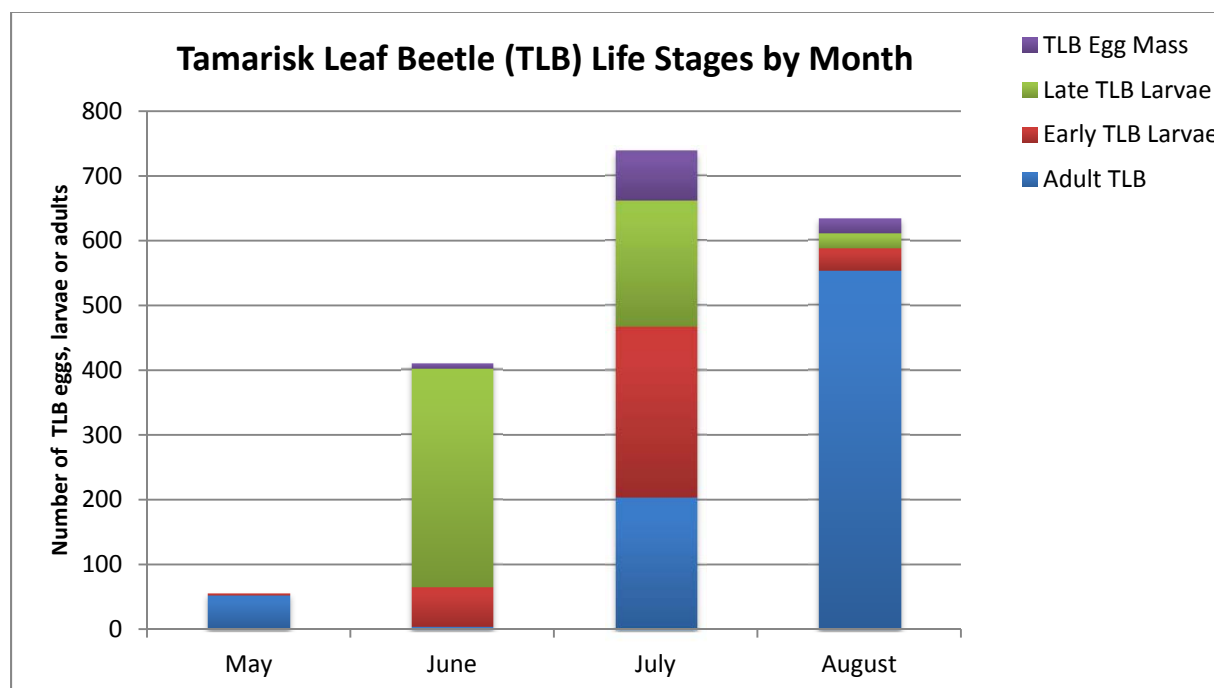


Figure 8. Abundance of each life stage of the tamarisk leaf beetle by month.

All data from the tamarisk sampling are available online and are now provided in one file (<http://bemp.org/data-sets/>). Photos of the trees at each sampling are available upon request (e.g., Picture 1).

References

BEMP 2015. Bosque Ecosystem Monitoring Program Annual Report: Tamarisk Leaf Beetle Monitoring, May-August 2015. <http://bemp.org/wp-content/uploads/2016/03/BEMP-TLB-Monitoring-Report-2015.pdf>

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