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Title. Habitat requirements of the bracted twistflower, *Streptanthus bracteatus* (Brassicaceae), a rare plant of central Texas.

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Abstract. We conducted a transplant experiment at Vireo Preserve to determine the effect of light environment on *Streptanthus bracteatus*. Data from this experiment are still being analyzed. We took hemispherical photographs of the canopy over each transplant and also over plants at most of the other known Austin populations of *S. bracteatus*. These are also still being analyzed.

Introduction. *Streptanthus bracteatus* is an endangered annual plant found only in a few counties. All known populations occur on the eastern and southern edges of the Edwards Plateau. The Austin populations form a substantial portion of known populations. The species is not listed under the Endangered Species Act. One of the goals of the grant that funded this research was to obtain information that will allow the recovery of this species and thus avoid the necessity of listing it.

This species is threatened by development, which has eliminated several Travis County populations (e.g., Mesa population) and threatens at least one of the remaining populations (Far West). The species is also threatened by deer browsing (Zippin 1997), and perhaps by low genetic variability (Pepper 2008). Two of its Austin populations (Mount Bonnell, Barton Creek greenbelt) are threatened by trampling and off-trail bicycles (Fowler, pers. obs.).

This experiment tested the hypothesis that sites with a more open canopy than is typical of the sites where *S. bracteatus* currently grows would provide a more favorable environment that it presently experiences. The hypothesis was suggested by the ecology of other *Streptanthus* species (Hickman 1993), which tend to be fire-followers; by observations of *S. bracteatus* plants growing in high-light microsites (B. Carr, pers. comm., N. Fowler, pers. obs.); and by the results of an experiment with *S. bracteatus* plants grown in shaded and unshaded pots (Ramsey 2008). It is also consistent with recent studies of the role of fire in oak woodlands and forests (Elliott et al. 1999, Bourg et al. 2005, Dey and Hartman 2005). To test the hypothesis, we transplanted small plants of *S. bracteatus* into woodland plots with and without reduction of woody plant cover.

Materials and Methods. Working with Lisa O'Donnell, I identified 10 pairs of plots at Vireo Preserve and identified the specific woody plants to be cut down or trimmed back in one plot of each pair. Plot location took advantage of existing canopy gaps, so we only manipulated understory plants. ("We" henceforth refers Dr. Fowler and her research assistant Alyson Center.) As the experiment progressed, we also trimmed back poison ivy, for health and safety reasons. All of the species we cut back or trimmed are known to regrow rapidly.

Because it was such a dry winter and spring, we constructed a complete irrigation

system: each transplant had its own drip irrigation hose. The experiment could not have been done without this irrigation system. Probably because our transplants were almost the only green plants available in the winter and early spring, they experienced very intense herbivory. Eventually each plant had its own chicken-wire cage in addition to the deer-exclusion fencing initially placed around each plot.

Survival, growth, and reproduction of all transplants were monitored regularly from germination through transplanting in January (initial plants) or March (replacements) until the experiment was terminated in June 2009. We collected some seeds from the transplants in order to measure the average number of seeds per cm of seed pod length. We allowed the rest to disperse naturally.

After the experiment was completed, we removed all the irrigation material, the chicken-wire cages, and the rest of the experiment materials from Vireo Preserve except for the deer fencing around each plot. If any of the *S. bracteatus* seeds from this experiment germinate, these fences will give them some protection. It will also be interesting to see how other plants respond to protection from deer. However, we can remove the deer fences at any time if Lisa or other city staff decided that they should not be there.

We took 180° hemispherical canopy photographs at the height of each transplant. We also visited the other known *S. bracteatus* populations and took canopy photographs at the height of the few *S. bracteatus* plants present in 2009 and at the same height where markers indicated that a plant had been present in previous years.

Results. We are still analyzing the data from this study.

Discussion. While there is no doubt that *S. bracteatus* is a woodland, not a savanna, species (Zippin xxx), it does not follow that current woodland canopy densities are optimal for this species. If our initial hypothesis is supported, it will suggest that *S. bracteatus* is not presently found in its optimal micro-environment. This will be particularly relevant to future attempts to establish new populations in more protected locations than it presently occupies.

Conclusion. The experiment was successfully conducted. Data are being analyzed.

Literature cited

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