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From: Norma L. Fowler and Gabriel L. De Jong, University of Texas at Austin

To: Lisa O'Donnell, Balcones Canyonlands Preserve, City of Austin

Subject: Annual Report, "Ecological characterization and data base construction for the bracted twistflower (*Streptanthus bracteatus*)"

This research project has two primary goals: to improve our understanding of the habitat requirements of *Streptanthus bracteatus*, and to assemble a GIS data base that includes all known past and present *S. bracteatus* locations and ecological information for each location. The results of this study will be useful in guiding searches for undiscovered *S. bracteatus* populations and the selection of sites for (re-) introductions, and will provide useful information for managers of *S. bracteatus* populations.

From May 23, 2012, through July 7, 2012, we collected new GPS records of plant locations. For each known population we recorded GPS co-ordinates for each plant and recorded several plant characteristics, including maximum height, number of siliques, lengths of siliques, and evidence of herbivory and powdery mildew. In total, we identified 1117 individual plants and clusters of plants in Travis, Bexar, Medina, and Uvalde Counties. Due to large population sizes, in the Medina County records some GPS co-ordinates represent centers of clusters, rather than individual plants; otherwise we mapped individual plants. The census data from San Antonio populations was supplied by Wendy Leonard, park naturalist for the City of San Antonio. We were denied access to Bright Leaf Preserve and to the site in Hays County, so no census data were obtained from these sites in 2012.

We revisited each location from July 11, 2012, through September 6, 2012, to measure physical environmental variables and describe plant communities. Hemispherical photographs were taken to measure tree and/or shrub cover. Rectilinear photographs were taken of rock cover in locations where *S. bracteatus* grew. To quantify the plant communities, we located circular plots and recorded the identities and numbers of herbaceous, shrub and tree species in each plot. The same variables were measured in comparison plots (or 'absence plots') located near known populations. Soil depth measurements were recorded within both types of plots. In total, we gathered data from 81 presence plots and 37 absence plots.

This fall we are assembling a set of GIS layers, including GPS co-ordinates of new and historical *S. bracteatus* populations, soil units, geological formations, digital elevations and

slopes, and recent aerial photographs. Our own data will provide additional GIS layers. We are working closely with Cullen Hanks (TPWD) to integrate the existing TPWD records (both original records and Element Occurrence Records) with the rest of the data.

Work still be accomplished: (1) complete the GIS data base; (2) analyze data to obtain a quantitative description of *S. bracteatus* habitat; (3) provide the results and completed data base to TPWD staff. We will also provide data and results to others interested in *S. bracteatus* within the constraints imposed on us by land owners and managers and by prudent concerns for potential vandalism or damage to this species. For example, the exact locations are not going to be included in future journal articles.

The data files will be sent separately via Dropbox, as we discussed. Our data sheets are in our own format, which is different from the City's. But you should be able to extract the same information from our Excel files. But please bear in mind that we are still working on this project, so things are still a bit rough.

If you have any questions please contact Norma or Gabe. Thanks!

Norma Fowler

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