Analysis of the effect of fire on the genetic diversity and structure on
Polygala lewtonii (Polygalaceae)

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Abstract

Polygala lewtonii is a federally endangered, fire-adapted Florida scrub endemic which is genetically structured at an extremely fine-scale, and which reproduces primarily by selfing or bi-parental inbreeding. *P. lewtonii* is amphicarpic, and has a mixed mating system with three different flower types, all of which have selfing mechanisms: above and below-ground closed cleistogamous flowers, and above-ground open-pollinated chasmogamous flowers with a delayed selfing mechanism. Here we obtained pre- and post-fire samples of *P. lewtonii* leaf and seed tissue, genotyped the individuals utilizing 11 microsatellite loci, and compared pre- and post-fire samples to assess the results for 1) genetic change, 2) changes in the favored mating system, and 3) changes in population structure after a fire event. We found that genetic patterns remain similar after fire, and that an allelic shift occurs, with new alleles emerging after a fire, and alleles which were present at a low frequency in the pre-fire population being lost. Additionally, population structure increases after fire. This suggests that after fire, there is an increasing reliance on selfing flowers for reproduction.