

Weekley, C.W., S.A. Smith, S.J. Haller, J.L. Schafer, and Eric S. Menges. Demographic Monitoring of *Paronychia chartacea* ssp. *minima*, a Federally Threatened Annual Herb, at Econfina Creek Water Management Area. Archbold Biological Station. Lake Placid, FL 33862

SUMMARY

This report summarizes results from year 1 of a long-term project to investigate the demography, autecology, and management requirements of the federally threatened *Paronychia chartacea* ssp. *minima*, an annual herb endemic to Bay and Washington Counties in the Florida panhandle. Twelve of the 13 previously documented populations occur on the sandy shorelines of karst ponds; one population (Paronychia Hill) occurs in a site formerly occupied by a sand pine plantation and currently undergoing restoration to longleaf pine wiregrass sandhill. The only publicly protected populations occur at Econfina Creek Water Management Area (WMA).

In October 2008, we established 103 0.25-m radius circular quadrats to collect demographic data on *P.c. minima* in the only three protected sites known to us at the time — Crux Pond, Whitewater Lake and Paronychia Hill. At the first two sites, *P.c. minima* occurs on the sloping shorelines of karst ponds. At Paronychia Hill, *P.c. minima* occurs on a sandhill restoration site that may also have been used as a staging area for highway construction. Because of conspicuous differences in surface soils and plant densities within Paronychia Hill, we treat this site as two separate populations, one on white sand and one on orange sand (referred to below as PH/white and PH/orange). With funding from the US Fish and Wildlife Service, in April 2009 we surveyed for seedlings, and in September 2009 we collected data on seedling survival, size, and reproductive status (plant sex and presence of fruits).

In the April 2009 seedling survey, we marked 4807 seedlings in the four populations. Overall, 52.5% of the sampling quadrats contained seedlings. Seedling recruitment was highly variable across the four populations, with densities ranging from 58 to 1308 seedlings per m². In the September census, seedling survival was 25.1% overall and did not differ significantly among the four populations. There was a weak and non-significant negative effect of density on seedling survival; the densest population had the lowest survival percentage. While plants in three of the four populations did not differ significantly in length or width, plants at Crux Pond were smaller by both measures. In three of four populations, the proportion of male and bisexual plants was approximately equal, but the Whitewater Lake population was dominated by male plants. For three populations, at least 47% of bisexual plants were recorded with fruits, but we recorded no fruits on bisexual plants in the PH/orange population. After one year, the PH/white population, which had a high number of large individuals that produced fruits, appears to be in the best condition.

Under a permit #862 from the Florida Division of Plant Industry, we collected voucher specimens representing the range of variation in sexually dimorphic individuals. We also collected several hundred seeds for use in a laboratory experiment to investigate the germination requirements of *P.c. minima*. We used a few flowers from our voucher specimens to photo document the morphology of male and bisexual flowers in this polygamodioecious species. We conducted a search for *P.c. minima* in the vicinity of Gully Lake. We found a previously undocumented population on a disturbed upland site NE of Crux Pond. This is only the second documented occurrence of a *P.c. minima* population not located on the shores of a karst pond.