Data Papers

Population projection models for 14 alien plant species in the presence and absence of aboveground competition

SAM C. LEVIN [iD],[1] RAELENE M. CRANDALL, AND TIFFANY M. KNIGHT

Abstract. Plant population ecologists strive to understand how environmental drivers influence demographic vital rates and thus population dynamics. Hundreds of studies have collected demographic data and used matrix and/or integral projection models to quantify lifetime fitness and population dynamics of plants. However, most of these studies have focused on native plant species, and there is a need for more studies on alien plants. Further, few studies on alien plants have experimentally manipulated environmental drivers in order to understand the mechanisms that allow alien plant species to have positive population growth. A synthetic understanding of the population dynamics of alien plant species will only be achieved if ecologists collect demographic data on many plant species and environments and provide the demographic data and model structure in a data archive for future comparisons and meta-analyses. Invasive alien species are a social, economic, and ecological issue that has become increasingly important in an increasingly globalized world. Researchers continue to forecast impacts and prevent new introductions by seeking a robust understanding of drivers of invasive species success and failure. Researchers have hypothesized that competitive differences may play a key role in determining alien species success in novel environments. Studies that experimentally manipulate competitors while quantifying demography provide mechanistic insight into species' responses to competition. To date, nearly all field manipulations of competition that measure plant demography and population dynamics have focused on native plant species. The data we provide here aim to address this gap in our knowledge for alien plant species. We present raw data and population-projection models for 14 alien plant species in eastern Missouri, USA. We sampled under ambient conditions and with all individuals of nonfocal species removed from the community, allowing us to project population dynamics in the presence and absence of competition. We have also included the data quantifying how much biomass we removed at the plot level during each removal procedure and data from our germination experiment. No copyright or proprietary restrictions are associated with the use of this data set other than citation of this Data Paper.

Key words: biomass; competition; demography; germination; invasive species; population dynamics.

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[1] E-mail: levisc8@gmail.com