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Marjorie T Jones* (marjorie.jones@pepperdine.edu). *A Discrete Stage-Structured Model of Newt Population Declines Due to Severe Drought.*

We introduce a discrete mathematical model for studying the population dynamics under drought of the California newt (*Taricha torosa*), a species of special concern in California. Multiple studies predict California's severe drought conditions will increase in duration and severity. Recent declines and local extinctions of California newt populations in Santa Monica Mountain (SMM) streams motivate our study of the impact of drought on newt population sizes. A precipitation deficit reduces the space for newt egg-laying in streams. To forecast newt population dynamics, we develop a nonlinear system of discrete equations that includes demographic parameters such as survival rates for newt life stages and egg production, which depend on habitat availability and rainfall. We estimate parameters using 15 years of stream survey data collected from the SMM, and our model captures the observed decline of a SMM newt population. We make predictions about how the length and severity of drought can affect available newt egg-laying sites as well as the newt population's likelihood of persistence or time to critical endangerment. We predict that sustained severe drought will critically endanger the newt population but that the population can rebound if a drought is sufficiently short. (Received September 14, 2016)