NORTHERN ILLINOIS UNIVERSITY

DEMOGRAPHY AND LIFE HISTORY OF AN URBAN POPULATION OF PLAINS GARTER SNAKES, *THAMNOPHIS RADIX*

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ABSTRACT

A six-year mark-recapture study, consisting of 567 captures of 216 individually marked snakes and the birth of 889 young born to 53 wild-caught females, was used to estimate demographic and life history parameters of an urban population of *Thamnophis radix*. Using the von Bertalanffy growth model, males were found to differ from females in asymptotic size, but not in the rate at which they approached this size. Size of known age individuals together with growth rate estimates were used to assign age at first capture. Age and sex were then used as grouping variables to obtain age- and sex-specific survival using program MARK. The results suggest that males and females have approximately equal survival in the 0 and 1 age-classes (annual survival $\approx$ 0.16 and 0.42, respectively), but that females have higher survival than males as adults (0.45 vs. 0.37). Population estimates and densities were calculated for each year for 1995 - 2000 using the Jolly-Seber method. In 2000, there were approximately 138 snakes per hectare (50 males and 88 females) at the study site. Average female fertility increased from 6.4 in one-year old females to 21 among six-year old females. Age-specific female fecundity was calculated assuming a post-breeding census. Age specific survival and fecundity were used with RAMAS software to model the current population for 10 generations. A prospective perturbation analysis was performed to determine potential effects of changes in survival and fecundity. Juvenile (age-class 0) and subadult (age-class 1) parameters, especially survivorships, were found to have the most influence on the population growth rate. Such explorations have implications for the development of management strategies and theories concerning life history evolution.