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Brittany C Stephenson* (bcs173@msstate.edu), Department of Mathematics and Statistics, P.O. Drawer MA, Mississippi State, MS 39762, and **Emily K Poole** (ekpoole@uark.edu) and **Bonnie J Roberson** (bjr76@msstate.edu). *Weak Allee effect, grazing, and S-shaped bifurcation curves.*

We study a one-dimensional reaction-diffusion model arising in population dynamics where the growth rate is a weak Allee type. In particular, we consider the effects of grazing on the steady states and discuss the complete evolution of the bifurcation curve of positive solutions as the grazing parameter varies. We obtain our results via the quadrature method and Mathematica computations. In particular, we establish that the bifurcation curve is S-shaped for certain ranges of the grazing parameter. We also prove this occurrence of an S-shaped bifurcation curve analytically. (Received September 02, 2010)