We study positive solutions to steady-state reaction-diffusion equations of the form:

\[-\Delta u = \lambda f(u); \Omega\]
\[\alpha(u)\frac{\partial u}{\partial \eta} + \gamma \sqrt{\lambda}[1 - \alpha(u)]u = 0; \partial\Omega\]

where $u$ is the population density, $f(u) = \frac{1}{a}u(u + a)(1 - u)$ represents a weak Allee effect type growth of the population with $a \in (0, 1)$, $\alpha(u)$ is the probability of the population staying in the habitat $\Omega$ when it reaches the boundary, and positive parameters $\lambda$ and $\gamma$ represent the domain scaling and effective exterior matrix hostility, respectively. In particular, we analyze the case when $\alpha(s) = \frac{1}{1 + (A - s)^2 + \epsilon}$ for all $s \in [0, 1]$, where $A \in (0, 1)$ and $\epsilon \geq 0$. In this case $1 - \alpha(s)$ represents a U-shaped relationship between density and emigration. Existence, nonexistence, and multiplicity results for this model are established via the method of sub-super solutions. (Received August 02, 2020)