1077-39-1259 **Saber N Elaydi*** (selaydi@trinity.edu), One Trinity Place, San Antonio, TX 78212, and **George Livadiotis**, San Antonio, TX. *General Allee effect and semistability in planar difference equations.*

We present a general framework for the notion of Allee effect in planar dynamical systems. Here the basic assumption is that the extension equilibrium $(0, 0)$ is locally attracting. The boundary of the basin of attraction of $(0, 0)$ will be called the Allee curve, which corresponds to the Allee-point in one-dimensional dynamics. We show how a phase space core of only three or four equilibrium points is sufficient to describe the essential dynamics that characterize the notion of the Allee effect. The traditional three types of stability (Attractor,Repeller,Saddle) allow the existence of only one case of a $3-point$ core and three cases of a $4-point$ core. A richer dynamics occurs if we add to those three stability types the notion of semistability. This phenomenon may be present only if one of the eigenvalues of the Jacobian of the map is unity. We provide the sufficient conditions for the existence of a semistable equilibrium, using the center manifold theory. Then we show that the existence of semi-stable equilibrium points increases dramatically the number of the possible cases of $3-$ or $4-point$ cores. Several examples will be provided to illustrate our theory. (Received September 18, 2011)