Relationship between lower and interior cycles of the Lotka-Volterra map

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We consider the plane triangle $\Delta = \{ [x,y] : 0 \leq x, 0 \leq y, x + y \leq 4 \}$ and the transformation $F : \Delta \to \Delta$, $[x,y] \mapsto [x(4 - x - y), xy]$. A point $P = [x,y] \in \Delta$ is said to be lower if $y = 0$. Any lower periodic point P is of the form $P = [4\sin^2 \frac{k\pi}{2^n \pm 1}, 0]$, where n and k are integers such that $0 < n$ and $0 \leq 2k < 2^n \pm 1$. We give a condition for a lower periodic point under which there is an interior periodic point with the same itinerary with respect to sets $A = \{[x,y] \in \Delta : x < 2\}$ and $B = \{[x,y] \in \Delta : x > 2\}$. From this we deduce a lower estimate of the number of interior periodic points with period n. Moreover, we present a condition for the itinerary under which the corresponding interior periodic point does not exist.