Multi-Species Rabbit Life Simulation

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In this project we looked at the populations of two competing rabbit species, Pygmy and Cottontail. In our simulation, the differences in these species boil down to maximum hop distance and maximum number of offspring. The Pygmy rabbits are able to produce up to 2 offspring every time they reproduce, as opposed to only 1 by the Cottontail, and the Cottontail rabbits can move up to 2 spaces per generation compared to the maximum of 1 space for Pygmy rabbits. In most scenarios (various number of initial populations, grass growth rates, and number of generations), I found the Cottontail rabbits to eventually beat out the Pygmy rabbits fully. The Pygmy rabbits most always died out. This could mean that the advantage that Cottontail rabbits in movement possessed over the Pygmy rabbits was in-fact more beneficial than the advantage the Pygmy rabbits hold in reproduction capability. While increasing the grass growth rate does seem to affect the time it takes to reach a stable population for the rabbits, the Pygmy rabbits still eventually die out, even if it takes 100s more generations. Decreasing the field size decreases the total population sizes of the rabbits, and we see a steep drop off from peak population size to what the population size stabilizes at. At larger field sizes, we see the Cottontail rabbit population (usually the rabbit species with stable non-zero population size) stabilize at their peak.