A Mathematical Model for the Propagation of an Animal Species on a Plain

J.N. Ndam[1], S. Dung[2]
[1] Department of Mathematics, University of Jos
ndamj@unijos.edu.ng
[2] Department of Mathematics, University of Jos
dungstephen@gmail.com

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A mathematical model for the dynamics of an animal species propagating on a plain is constructed. Travelling wave solutions are then sought for two cases, the case with constant diffusion coefficient and that with density-dependent diffusion coefficient. The results show the existence of travelling wave solutions in both cases. The existence of travelling wave solutions for the two-dimensional model is important as it captures more realistically the physical interactions of species in a habitat.The minimum wave speeds as well as the basins of attraction were determined. The biological significance of the basins of attraction are outlined and is still a subject for further investigation.

References

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