

### The book was found

# Mathematical Ecology Of Populations And Ecosystems



## MATHEMATICAL ECOLOGY OF POPULATIONS AND ECOSYSTEMS

JOHN PASTOR



#### Synopsis

Population ecologists study how births and deaths affect the dynamics of populations and communities, while ecosystem ecologists study how species control the flux of energy and materials through food webs and ecosystems. Although all these processes occur simultaneously in nature, the mathematical frameworks bridging the two disciplines have developed independently. Consequently, this independent development of theory has impeded the cross-fertilization of population and ecosystem ecology. Using recent developments from dynamical systems theory, this advanced undergraduate/graduate level textbook shows how to bridge the two disciplines seamlessly. The book shows how bifurcations between the solutions of models can help understand regime shifts in natural populations and ecosystems once thresholds in rates of births, deaths, consumption, competition, nutrient inputs, and decay are crossed. Mathematical Ecology is essential reading for students of ecology who have had a first course in calculus and linear algebra or students in mathematics wishing to learn how dynamical systems theory can be applied to ecological problems.

#### **Book Information**

Paperback: 344 pages Publisher: Wiley-Blackwell; 1 edition (August 11, 2008) Language: English ISBN-10: 1405177950 ISBN-13: 978-1405177955 Product Dimensions: 7.4 x 0.9 x 9.6 inches Shipping Weight: 2 pounds (View shipping rates and policies) Average Customer Review: Be the first to review this item Best Sellers Rank: #2,871,137 in Books (See Top 100 in Books) #97 in Books > Science & Math > Mathematics > Applied > Biomathematics #740 in Books > Science & Math > Physics > System Theory #2077 in Books > Textbooks > Science & Mathematics > Biology & Life Sciences > Ecology

#### **Customer Reviews**

"Nevertheless, it is an excellent summary which will sweep away the cobwebs from the mind of someone who has learnt this stuff at some time in the past. . . It would be ideal as a text for a course taught in a mathematics department, to convince mathematics students that their skills in differential equations can be applied to ecological problems." (Austral Ecology, 2011) "Its best feature a the

scientific soundness t hat permeates the whole book, founded on a robust mathematical treatment of most of the arguments." (Ecoscience, June 2010)"Pastor (Univ. of Minnesota, Duluth) does an admirable job of bridging the gap, providing a work that should quickly become a popular choice for upper-level undergraduate or graduate courses in both disciplines." (CHOICE, January 2009)

Population ecologists study how births and deaths affect the dynamics of populations and communities, while ecosystem ecologists study how species control the flux of energy and materials through food webs and ecosystems. Although all these processes occur simultaneously in nature, the mathematical frameworks bridging the two disciplines have developed independently. Consequently, this independent development of theory has impeded the cross-fertilization of population and ecosystem ecology. Using recent developments from dynamical systems theory, this advanced undergraduate/graduate level textbook shows how to bridge the two disciplines seamlessly. The book shows how bifurcations between the solutions of models can help understand regime shifts in natural populations and ecosystems once thresholds in rates of births, deaths, consumption, competition, nutrient inputs, and decay are crossed. Mathematical Ecology is essential reading for students of ecology who have had a first course in calculus and linear algebra or students in mathematics wishing to learn how dynamical systems theory can be applied to ecological problems.

#### Download to continue reading...

Mathematical Ecology of Populations and Ecosystems Communication Disorders in Multicultural and International Populations, 4e (Communication Disorders In Multicultural Populations) Community/Public Health Nursing - E-Book: Promoting the Health of Populations (Community/Public Health Nursing: Promoting the Health of Populations) Evolution in Age-Structured Populations (Cambridge Studies in Mathematical Biology) Buddhism and Ecology: The Interconnection of Dharma and Deeds (Religions of the World and Ecology) Maximum Entropy and Ecology: A Theory of Abundance, Distribution, and Energetics (Oxford Series in Ecology and Evolution) The World of Wolves: New Perspectives on Ecology, Behaviour, and Management (Energy, Ecology and Environment) Ecology: Global Insights and Investigations (Botany, Zoology, Ecology and Evolution) Freshwater Ecology, Second Edition: Concepts and Environmental Applications of Limnology (Aquatic Ecology) Social Ecology: Applying Ecological Understanding to our Lives and our Planet (Social Ecology Series) Ecology: Global Insights & Investigations (Botany, Zoology, Ecology and Evolution) Biology and Ecology of Earthworms (Biology & Ecology of Earthworms) Freshwater Ecology: Concepts and Environmental Applications of Limnology (Aquatic Ecology) Time and Complexity in Historical Ecology: Studies in the Neotropical Lowlands (Historical Ecology Series) Reptile Ecology and Conservation: A Handbook of Techniques (Techniques in Ecology & Conservation) Ecology and Classification of North American Freshwater Invertebrates, Third Edition (Aquatic Ecology (Academic Press)) Freshwater Algae of North America: Ecology and Classification (Aquatic Ecology) The Ecology of Phytoplankton (Ecology, Biodiversity and Conservation) Wetland Ecology (Cambridge Studies in Ecology) Tropical Stream Ecology (Aquatic Ecology)

Contact Us

DMCA

Privacy

FAQ & Help