
Applications Of Landscape Genetics In Conservation Biology

Mapping Humanity
Landscape Genetics
Essentials of Landscape Ecology
A Changing World
A Primer of Ecological Genetics
Landscape Genetics
Conservation Genetics in the Neotropics
Essentials of Landscape Ecology
Introduction to Conservation Genetics
The Least Cost Path From Landscape Genetics to
Landscape Genomics
Conservation and the Genetics of Populations
Population Genetics
History of Landscape Ecology in the United States
Advances of Spatio-Temporal Models in Ecology
Landscape Genetics
Applications of Landscape Genetics for Wildlife
Conservation and Management
Predictive Species and Habitat Modeling in
Landscape Ecology
Advances in Conservation Research and
Application: 2011 Edition

Principles and Applications of Molecular
Diagnostics
Molecular Markers, Natural History and Evolution
Population Genomics
Strange Natures
Conservation Biology
Conservation Biology
Linkages in the Landscape
Landscape Genetics
Habitat Fragmentation and Landscape Change
Molecular Approaches in Plant Biology and
Environmental Challenges
Clinical Applications for Next-Generation
Sequencing
Special Issue Landscape Genetics
Spatial Complexity, Informatics, and Wildlife
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Connectivity in a Habitat Generalist
Principles of Animal Behavior
Spatial Ecology and Conservation Modeling
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The Adaptive Landscape in Evolutionary Biology
Applying Landscape Ecology in Biological
Conservation

Applications
Of
Landscape Genetics In
Conservation Biology
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FITZPATRICK K JADON

*Mapping
Humanity*
Springer
Nature
Consciously or
not, wildlife
managers
generally act
from a
theoretical
basis,
although they
may not be
fully versed in
the details or
ramifications
of that theory.
In practice,
the
predictions of
the
practitioners
sometimes
prove more
accurate than
those of the

theoreticians.
Practitioners
and
theoreticians
need to work
together, but
this proves di
**Landscape
Genetics**
BenBella
Books
This book
explores how
genetics and
the new
technologies
in genomics
have been
used for
conservation
of plants and
animals in the
Neotropics. It
shows the
new
perspective
for
conservation
genetics
beyond the
use of
theoretical

and methods
in genetics at
species level
and presents
how genetics
and genomics
can be used
for assessing
communities.
Conservation
genetics and
genomics are
presented as
a helpful field
of study for
resolving
taxonomic
uncertainties
and hidden
biodiversity,
understanding
populations
and extinction
risk, genetic
management,
wildlife
forensic
genetics,
assessing
biology and
molecular
ecology,

assessing communities, conservation genomics and the use of conservation biology and genetics in science learning, highlighting case studies in the Neotropics. Applications of conservation genetics for management or policy, decision making, planning, and implementation of conservation practice in the Neotropics are addressed across chapters. This book will interest to

researchers and students in conservation genetics and biology conservation interested in the Neotropics. Stakeholders and decision makers in conservation biology may also find this book useful. *Essentials of Landscape Ecology* Springer Understanding the nature of genetic variation in natural populations is an underlying theme of population genetics. In recent years

population genetics has benefited from the incorporation of landscape and environmental data into pre-existing models of isolation by distance (IBD) to elucidate features influencing spatial genetic variation. Many of these landscape genetics studies have focused on populations separated by discrete barriers (e.g., mountain ridges) or species with specific habitat

requirements (i.e., habitat specialists). One difficulty in using a landscape genetics approach for taxa with less stringent habitat requirements (i.e., generalists) is the lack of obvious barriers to gene flow and preference for specific habitats. My study attempts to fill this information gap to understand mechanisms underlying population subdivision in generalists,

using the squirrel treefrog (*Hyla squirella*) and a system for classifying 'terrestrial ecological systems' (i.e. habitat types). I evaluate this dataset with microsatellite markers and a recently introduced method based on ensemble learning (Random Forest) to identify whether spatial distance, habitat types, or both have influenced genetic connectivity among 20 *H. squirella*

populations. Next, I hierarchically subset the populations included in the analysis based on (1) genetic assignment tests and (2) Mantel correlograms to determine the relative role of spatial distance in shaping landscape genetic patterns. Assignment tests show evidence of two genetic clusters that separate populations in Florida's panhandle (Western cluster) from those in

peninsular Florida and southern Georgia (Eastern cluster). Mantel correlograms suggest a patch size of approximately 150 km. Landscape genetic analyses at all three spatial scales yielded improved model fit relative to isolation by distance when including habitat types. A hierarchical effect was identified whereby the importance of spatial distance (km) was the strongest predictor of patterns of genetic differentiation above the scale of the genetic patch. Below the genetic patch, spatial distance was still an explanatory variable but was only approximately 30% as relevant as mesic flatwoods or upland oak hammocks. Thus, it appears that habitat types largely influence patterns of genetic connectivity at local scales but the signal of IBD becomes the dominant driver of regional connectivity. My results highlight some habitats as highly relevant to increased genetic connectivity at all spatial scales (e.g., upland oak hammocks) while others show no association (e.g., silviculture) or scale specific associations (e.g., pastures only at global scales). Given these results it appears that

treating habitat as a binary metric (suitable/non-suitable) may be overly simplistic for generalist species in which gene flow probably occurs in a spectrum of habitat suitability. The overall pattern of spatial genetic and landscape genetic structure identified here provides insight into the evolutionary history and patterns of population connectivity for *H. squirella* and improves

our understanding of the role of matrix composition for habitat generalists. *A Changing World* Springer Science & Business Media "A good companion for those with a science background interested in learning more about human genetics." —Booklist Thanks to the popularity of personal genetic testing services, it's now easier than ever to get

information about our own unique DNA—but who does this information really benefit? And, as genome editing and gene therapy transform the healthcare landscape, what do we gain—and what might we give up in return? Inside each of your cells is the nucleus, a small structure that contains all of the genetic information encoded by the DNA inside, your genome. Not long ago, the

first human genome was sequenced at a cost of nearly \$3 billion; now, this same test can be done for about \$1,000. This new accessibility of genome sequence information creates huge potential for advances in how we understand and treat disease, among other things. It also raises significant concerns regarding ethics and personal privacy. In Mapping

Humanity: How Modern Genetics Is Changing Criminal Justice, Personalized Medicine, and Our Identities, cellular biology expert Joshua Z. Rappoport provides a detailed look at how the explosion in genetic information as a result of cutting-edge technologies is changing our lives and our world. Inside, discover: • An in-depth look at how your personal genome creates the

unique individual that you are • How doctors are using DNA sequencing to identify the underlying genetic causes of disease • Why the field of gene therapy offers amazing potential for medical breakthroughs—and why it's taking so long • The fantastic potential—and troubling concerns—surrounding genome editing • The real impact—and validity—of popular personal genetic

<p>testing products, such as 23andMe • Details of how molecular biology and DNA are changing the criminal justice system • Facts you should know about Genetically Modified Organisms (GMOs) Throughout, in compelling, accessible prose, Rappoport explores the societal, ethical, and economic impacts of this new era. Offering a framework for balancing the potential risks</p>	<p>and benefits of genetic information technologies and genetic engineering, Mapping Humanity is an indispensable guide to navigating the possibilities and perils of our gene-centric future. <i>A Primer of Ecological Genetics</i> Springer Science & Business Media Modern landscape research uses a panoply of techniques to further our understanding of our changing</p>	<p>world, including mathematics, statistics and advanced simulation techniques to combine empirical observations with known theories. This book identifies emerging fields and new challenges that are discussed within the framework of the 'driving forces' of Landscape Development. the book addresses all of the 'hot topics' in this important area of study and emphasizes</p>
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major contemporary trends in these fields. *Landscape Genetics* Springer Science & Business Media
 A groundbreaking examination of the implications of synthetic biology for biodiversity conservation Nature almost everywhere survives on human terms. The distinction between what is natural and what is human-made, which has informed conservation for centuries,

has become blurred. When scientists can reshape genes more or less at will, what does it mean to conserve nature? The tools of synthetic biology are changing the way we answer that question. Gene editing technology is already transforming the agriculture and biotechnology industries. What happens if synthetic biology is also used in conservation to control invasive species, fight

wildlife disease, or even bring extinct species back from the dead? Conservation scientist Kent Redford and geographer Bill Adams turn to synthetic biology, ecological restoration, political ecology, and de-extinction studies and propose a thoroughly innovative vision for protecting nature. Conservation Genetics in the Neotropics Oxford University

Press
This book
aims to make
population
genetics
approachable,
logical and
easily
understood.
To achieve
these goals,
the book's
design
emphasizes
well explained
introductions
to key
principles and
predictions.
These are
augmented
with case
studies as well
as illustrations
along with
introductions
to classical
hypotheses
and debates.
Pedagogical
features in the
text include:

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that guide
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by-step
through
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simulations
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mathematical
derivations.
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boxes that
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genetics This
text also
offers a highly
accessible
introduction to
coalescent
theory, the
major
conceptual
advance in
population
genetics of
the last two
decades.
[Essentials of](#)
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Wiley & Sons
Conservation
and the
Genetics of
Populations
gives
acomprehensi
ve overview of
the essential
background,
concepts,
andtools
needed to
understand

<p>how genetic information can be used to develop conservation plans for species threatened with extinction. Provides a thorough understanding of the genetic basis of biological problems in conservation. Uses a balance of data and theory, and basic and applied research, with examples taken from both the animal and plant kingdoms. An associated website</p>	<p>contains example data sets and software programs to illustrate population genetic processes and methods of data analysis. Discussion questions and problems are included at the end of each chapter to aid understanding. Features Guest Boxes written by leading people in the field including James F. Crow, Nancy FitzSimmons, Robert C. Lacy, Michael W.</p>	<p>Nachman, Michael E. Soule, Andrea Taylor, Loren H. Rieseberg, R.C. Vrijenhoek, Lisette Waits, Robin S. Waples and Andrew Young. Supplementary information designed to support Conservation and the Genetics of Populations including: Downloadable sample chapter Answers to questions and problems Data sets illustrating problems from the book Data analysis software</p>
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GENETICS:
CONCEPTS,
METHODS,

APPLICATIONS
Edited by Niko
Balkenhol,
Samuel A.
Cushman,
Andrew T.
Storfer, Lisette
P. Waits
Landscape
genetics is an
exciting and
rapidly
growing field,
melding
methods and
theory from
landscape
ecology and
population
genetics to
address some
of the most
challenging
and urgent
ecological and
evolutionary
topics of our
time.
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genetic
approaches
now enable

researchers to
study in detail
how
environmental
complexity in
space and
time affect
gene flow,
genetic drift,
and local
adaptation.
However,
learning about
the concepts
and methods
underlying the
field remains
challenging
due to the
highly
interdisciplinary
nature of
the field,
which relies
on topics that
have
traditionally
been treated
separately in
classes and
textbooks. In
this edited

volume, some of the leading experts in landscape genetics provide the first comprehensive introduction to underlying concepts, commonly used methods, and current and future applications of landscape genetics. Consistent with the interdisciplinary nature of the field, the book includes textbook-like chapters that synthesize fundamental concepts and methods underlying landscape

genetics (Part 1), chapters on advanced topics that deserve a more in-depth treatment (Part 2), and chapters illustrating the use of concepts and methods in empirical applications (Part 3). Aimed at beginning landscape geneticists and experienced researchers alike, this book will be helpful for all scientists and practitioners interested in learning, teaching, and applying

landscape genetics. [The Least Cost Path From Landscape Genetics to Landscape Genomics](#) Springer Science & Business Media The 'Adaptive Landscape' has been a central concept in population genetics and evolutionary biology since this powerful metaphor was first formulated in 1932. This volume brings together historians of science, philosophers, ecologists,

and evolutionary biologists, to discuss the state of the art from several different perspectives. Conservation and the Genetics of Populations Scholarly Editions This book describes the emergence of landscape ecology, its current status as a new integrative science, and how distinguished scholars in the field of landscape ecology view the future regarding new

challenges and career opportunities. Over the past thirty years, landscape ecology has utilized development in technology and methodology (e.g., satellites, GIS, and systems technologists) to monitor large temporal-spatial scale events and phenomena. These events include changes in vegetative cover and composition due to both natural disturbance and human

cause—changes that have academic, economic, political, and social manifestations. There is little doubt, due to the temporal-spatial scale of this integrative science, that scholars in fields of study ranging from anthropology to urban ecology will desire to compare their fields with landscape ecology during this intellectually and technologically fertile time. History of Landscape

Ecology in the United States brings to light the vital role that landscape ecologists will play in the future as the human population continues to increase and fragment the natural environment. Landscape ecology is known as a synthesized intersection of disciplines; but new theories, concepts, and principles have emerged that form the foundation of a new transdiscipline .
Population

Genetics
 Springer
 Nature
 This book provides a foundation for modern applied ecology. Much of current ecology research and conservation addresses problems across landscapes and regions, focusing on spatial patterns and processes. This book is aimed at teaching fundamental concepts and focuses on learning-by-doing through the use of examples with

the software R. It is intended to provide an entry-level, easily accessible foundation for students and practitioners interested in spatial ecology and conservation.
History of Landscape Ecology in the United States
 John Wiley & Sons
 Most projects in Landscape Ecology, at some point, define a species-habitat association. These models are inherently spatial, dealing with

landscapes and their configurations . Whether coding behavioral rules for dispersal of simulated organisms through simulated landscapes, or designing the sampling extent of field surveys and experiments in real landscapes, landscape ecologists must make assumptions about how organisms experience and utilize the landscape. These convenient working

postulates allow modelers to project the model in time and space, yet rarely are they explicitly considered. The early years of landscape ecology necessarily focused on the evolution of effective data sources, metrics, and statistical approaches that could truly capture the spatial and temporal patterns and processes of interest. Now that these tools are well established, we reflect on

the ecological theories that underpin the assumptions commonly made during species distribution modeling and mapping. This is crucial for applying models to questions of global sustainability. Due to the inherent use of GIS for much of this kind of research, and as several authors' research involves the production of multicolored map figures, there would be an 8-page color insert.

Additional color figures could be made available through a digital archive, or by cost contributions of the chapter authors. Where applicable, would be relevant chapters' GIS data and model code available through a digital archive. The practice of data and code sharing is becoming standard in GIS studies, is an inherent method of this book, and will serve to add additional research value

to the book for both academic and practitioner audiences. Advances of Spatio-Temporal Models in Ecology CRC Press
The loss and fragmentation of natural habitats is one of the major issues in wildlife management and conservation. Habitat "corridors" are sometimes proposed as an important element within a conservation strategy. Examples are given of

corridors both as pathways and as habitats in their own right. Includes detailed reviews of principles relevant to the design and management of corridors, their place in regional approaches to conservation planning, and recommendations for research and management. **Landscape Genetics** Elsevier
As Earth faces the greatest mass extinction in 65 million years, the present is a

moment of tremendous foment and emergence in ecological science. With leaps in advances in ecological research and the technical tools available, scientists face the critical task of challenging policymakers and the public to recognize the urgency of our global crisis. This book focuses directly on the interplay between theory, data, and analytical methodology in the rapidly evolving fields

of animal ecology, conservation, and management. The mixture of topics of particular current relevance includes landscape ecology, remote sensing, spatial modeling, geostatistics, genomics, and ecological informatics. The greatest interest to the practicing scientist and graduate student will be the synthesis and integration of these topics to provide a

composite view of the emerging field of spatial ecological informatics and its applications in research and management. **Applications of Landscape Genetics for Wildlife Conservation and Management** Sinauer Associates Incorporated The field of landscape genetics enables the study of infectious disease dynamics by connecting the landscape features with

evolutionary changes. Quantifying genetic correlation across space is helpful in providing insight into the rate of spread of an infectious disease. We investigate two genetic patterns in spatially referenced single-nucleotide polymorphisms (SNPs): isolation by distance and isolation by resistance. We model the data using a Generalized Linear Mixed effect Model (GLMM) with

spatially referenced random effects and provide a novel approach for estimating parameters in spatial GLMMs. In this approach, we use the links between binary probit models and bivariate normal probabilities to directly compute the model-based covariance function for spatial binary data. Parameter estimation is based on minimizing sum of squared

distance between the elements of sample covariance and model-based covariance matrices. We analyze *Brucella Abortus* SNP data from spatially referenced hosts in the Greater Yellowstone Ecosystem (GYE). *B. abortus* is a bacterium which causes Brucellosis in human, wildlife, and livestock. We propose a hierarchical model to describe the transmission

of Brucellosis in elk in the GYE. We model the disease spread process using a dynamical stochastic spatiotemporal susceptible-infected-susceptible (SIS) model that captures spatial heterogeneity in dynamics using a conditional autoregressive (CAR) covariance structure in parameter model. To inform spatial rates of transmission, we propose estimating elk movement

and migration rates using two different migration/immigration models. Our proposed disease spread process is constrained and we propose a numerical approximation method to find the numerical solution of the constrained process by projection of the numerical solution of unconstrained process. Movement behavior of animal changes over longer time scales. Multistate

time series models based on Hidden Markov Models (HMMs) are popular that enable capturing variability in movement behavior while accounting for temporal autocorrelation. Recent studies have found evidence that movement behavior of animals cannot be easily classified into a small number of states. We propose a Bayesian non-parametric mixture model

for stochastic differential equation (SDE) animal movement model by adapting a flexible clustering algorithm described as a probit stick-breaking process (PSBP). By clustering the SDE model parameters, we account for time-varying movement behavior. We apply this method to migratory lesser black-backed gulls data. Analyzing their movement behavior provides insights about the migration strategies. *Predictive Species and Habitat Modeling in Landscape Ecology* Springer Nature Habitat loss and degradation that comes as a result of human activity is the single biggest threat to biodiversity in the world today. Habitat Fragmentation and Landscape Change is a groundbreaking work that brings together a wealth of information from a wide range of sources to define the ecological problems caused by landscape change and to highlight the relationships among landscape change, habitat fragmentation, and biodiversity conservation. The book synthesizes a large body of information from the scientific literature considers key theoretical principles for examining

and predicting effects examines the range of effects that can arise explores ways of mitigating impacts reviews approaches to studying the problem discusses knowledge gaps and future areas for research and management Habitat Fragmentation and Landscape Change offers a unique mix of theoretical and practical information, outlining general principles and

approaches and illustrating those principles with case studies from around the world. It represents a definitive overview and synthesis on the full range of topics that fall under the widely used but often vaguely defined term "habitat fragmentation".
Advances in Conservation Research and Application: 2011 Edition
Springer
Molecular approaches have opened new windows

on a host of ecological and evolutionary disciplines, ranging from population genetics and behavioral ecology to conservation biology and systematics. Molecular Markers, Natural History and Evolution summarizes the multi-faceted discoveries about organisms in nature that have stemmed from analyses of genetic markers provided by polymorphic proteins and

DNAs. The first part of the book introduces rationales for the use of molecular markers, provides a history of molecular phylogenetics, and describes a wide variety of laboratory methods and interpretative tools in the field. The second and major portion of the book provides a cornucopia of biological applications for molecular markers, organized along a scale from micro-evolutionary

topics (such as forensics, parentage, kinship, population structure, and intra-specific phylogeny) to macro-evolutionary themes (including species relationships and the deeper phylogenetic structure in the tree of life). Unlike most prior books in molecular evolution, the focus is on organismal natural history and evolution, with the macromolecules being the means rather

than the ends of scientific inquiry. Written as an intellectual stimulus for the advanced undergraduate, graduate student, or the practicing biologist desiring a wellspring of research ideas at the interface of molecular and organismal biology, this book presents material in a manner that is both technically straightforward, yet rich with concepts and with empirical examples from the world

of nature.
**Principles
and
Applications
of Molecular
Diagnostics**
Oxford
University
Press
Principles of
Animal
Behavior has
long been
considered
the most
current and
engaging
introduction to
animal
behavior. The
Third Edition
is now also
the most
comprehensiv
e and
balanced in its
approach to
the theoretical
framework
behind how
biologists
study

behavior.
**Molecular
Markers,
Natural
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Springer
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Despite the
substantial
interest in
landscape
genetics from
the scientific
community,
learning about
the concepts
and methods
underlying the
field remains
very
challenging.
The reason for
this is the
highly
interdisciplinar
y nature of
the field,
which
combines

population
genetics,
landscape
ecology, and
spatial
statistics.
These fields
have
traditionally
been treated
separately in
classes and
textbooks,
and very few
scientists
have received
the
interdisciplinar
y training
necessary to
efficiently
teach or apply
the diversity
of techniques
encompassed
by landscape
genetics. To
address the
current
knowledge
gap, this book
provides the

first in depth treatment of landscape genetics in a single volume. Specifically, this book delivers fundamental concepts and methods underlying the field, covering particularly important analytical methods in detail, and presenting empirical and theoretical applications of landscape genetics for a variety of environments and species. Consistent with the interdisciplinary nature of landscape

genetics, the book combines an introductory, textbook like section with additional sections on advanced topics and applications that are more typical of edited volumes. The chapter topics and the expertise of the authors and the editorial team make the book a standard reference for anyone interested in landscape genetics. The book includes contributions from many of

the leading researchers in landscape genetics. The group of scientists we have assembled has worked on several collaborative projects over the last years, including a large number of peer reviewed papers, several landscape genetics workshops at international conferences, and a distributed graduate seminar on landscape genetics. Based on the experiences

gained during these collaborative teaching and research activities, the book includes chapters that synthesize fundamental concepts and methods underlying landscape genetics (Part 1), chapters on advanced topics that deserve a more in depth treatment (Part 2), and chapters illustrating the use of concepts and methods in empirical applications (Part 3). This structure ensures a high usefulness of the book for beginning landscape geneticists and experienced researchers alike, so that it has a broad target audience. At least one of the four co editors is involved in almost every chapter of the book, thereby ensuring a high consistency and coherency among chapters.

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