



Annu. Rev. Ecol. Syst. 1992. 23:481-506
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POPULATION VIABILITY ANALYSIS

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INTRODUCTION

Population viability analysis (PVA) is a process. It entails evaluation of data and models for a population to anticipate the likelihood that a population will persist for some arbitrarily chosen time into the future (125, 128). A closely related concept is minimum viable population (MVP) analysis. An MVP is an estimate of the minimum number of organisms of a particular species that constitutes a viable population. Reference is also made to population vulnerability analysis which is a negative appellation for PVA. PVA embraces MVP, but without seeking to estimate the absolute minimum population necessary to keep a species viable (136).

In the United States, the US Forest Service has a mandate to preserve viable populations on its lands under the National Forest Management Act (158). Likewise, the US Fish and Wildlife Service and the National Marine Fisheries Service have been evaluating PVAs for many species or populations proposed for listing under the Endangered Species Act (152). Establishing criteria for what constitutes a viable population is no longer strictly an academic pursuit.

PVAs have been attempted for at least 35 species; perhaps the most celebrated are those for the grizzly bear (*Ursus arctos horribilis*) (126, 129, 144), and the northern spotted owl (*Strix occidentalis caurina*) (18, 79, 95, 98a). Most PVAs are simulation studies that remain unpublished, or when published, they may only include outlines of model structure (95, 126, 131). Others invoke analytical methods or "rules of thumb," always burdened with severe assumptions (31, 152). PVAs vary according to the ecology of the species, the expertise of the modelers, and the extent of available data.

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Population Viability Analysis

**Barry Richard Noon, Fred B.
Samson, Nels Johnson**



Population Viability Analysis:

Population Viability Analysis Steven R. Beissinger, Dale R. McCullough, 2002-05-04 Many of the world's leading conservation and population biologists evaluate what has become a key tool in estimating extinction risk and evaluating potential recovery strategies population viability analysis or PVA

Population Viability Analysis Mark S. Boyce, National Council for Air and Stream Improvement, University of Wyoming, Wyoming Water Research Center, 1992 *Applications of Population Viability Analysis to Biodiversity Conservation*, 1995

Quantitative Conservation Biology William F. Morris, Daniel F. Doak, 2002-01-01 The goal of this book is to provide practical intelligible and intuitive explanations of population modelling to empirical ecologists and conservation biologists Modelling methods that do not require large amounts of data typically unavailable for endangered species are emphasised As such the book is appropriate for undergraduate and graduate students interested in quantitative conservation biology managers charged with preserving endangered species and in short for any conservation biologist or ecologist seeking to better understand the analysis and modelling of population data

Use of Population Viability Analysis in Conservation Management in New Zealand R. J. Keedwell, 2004-01-01

Emerging Issues in Population Viability Analysis J. Michael Reed, Population Viability Analysis Mark S. Boyce, 1993

Fundamentals of Conservation Biology Malcolm L. Hunter, Jr., James P. Gibbs, 2009-03-12 In the new edition of this highly successful book Malcolm Hunter and new co author James Gibbs offer a thorough introduction to the fascinating and important field of conservation biology focusing on what can be done to maintain biodiversity through management of ecosystems and populations Starting with a succinct look at conservation and biodiversity this book progresses to contend with some of the subject's most complex topics such as mass extinctions ecosystem degradation and over exploitation Discusses social political and economic aspects of conservation biology Thoroughly revised with over six hundred new references and web links to many of the organizations involved in conservation biology striking photographs and maps Artwork from the book is available to instructors online at www.blackwellpublishing.com/hunter and by request on CD ROM

Species Conservation and Management H. Resit Akcakaya, Mark A. Burgman, Oskar Kindvall, Chris C. Wood, Per Sjogren-Gulve, Jeff S. Hatfield, Michael A. McCarthy, 2004-10-07 This edited volume is a collection of population and metapopulation models for a wide variety of species including plants invertebrates fishes amphibians reptiles birds and mammals Each chapter of the book describes the application of RAMAS GIS 4.0 to one species with the aim of demonstrating how various life history characteristics of the species are incorporated into the model and how the results of the model has been or can be used in conservation and management of the species The book comes with a CD that includes a demo version of the program and the data files for each species

Foundations of Restoration Ecology Donald A. Falk, Margaret A. Palmer, Joy B. Zedler, 2013-03-19 As the practical application of ecological restoration continues to grow there is an increasing need to connect restoration practice to areas of underlying ecological theory *Foundations of Restoration Ecology*

is an important milestone in the field bringing together leading ecologists to bridge the gap between theory and practice by translating elements of ecological theory and current research themes into a scientific framework for the field of restoration ecology Each chapter addresses a particular area of ecological theory covering traditional levels of biological hierarchy such as population genetics demography community ecology as well as topics of central relevance to the challenges of restoration ecology such as species interactions fine scale heterogeneity successional trajectories invasive species ecology ecophysiology Several chapters focus on research tools research design statistical analysis modeling or place restoration ecology research in a larger context large scale ecological phenomena macroecology climate change and paleoecology evolutionary ecology The book makes a compelling case that a stronger connection between ecological theory and the science of restoration ecology will be mutually beneficial for both fields restoration ecology benefits from a stronger grounding in basic theory while ecological theory benefits from the unique opportunities for experimentation in a restoration context Foundations of Restoration Ecology advances the science behind the practice of restoring ecosystems while exploring ways in which restoration ecology can inform basic ecological questions It provides the first comprehensive overview of the theoretical foundations of restoration ecology and is a must have volume for anyone involved in restoration research teaching or practice

Population Viability Analysis of Age-structured Populations Miguel A. Cisneros,1995 **Population Viability Analysis - General Principles and Applications** Barry Richard Noon,Fred B. Samson,Nels Johnson,2000 Evaluating Population Viability Analysis Barry William Brook,1999 Library of Congress Subject Headings Library of Congress,Library of Congress. Subject Cataloging Division,Library of Congress. Office for Subject Cataloging Policy,2013

Introduction to Conservation Genetics Richard Frankham,Jonathan D. Ballou,David Anthony Briscoe,2010 This impressive author team brings the wealth of advances in conservation genetics into the new edition of this introductory text including new chapters on population genomics and genetic issues in introduced and invasive species They continue the strong learning features for students main points in the margin chapter summaries vital support with the mathematics and further reading and now guide the reader to software and databases Many new references reflect the expansion of this field With examples from mammals birds reptiles fish amphibians plants and invertebrates this is an ideal introduction to conservation genetics for a broad audience The text tackles the quantitative aspects of conservation genetics and has a host of pedagogy to support students learning the numerical side of the subject Combined with being up to date its user friendly writing style and first class illustration programme forms a robust teaching package *Population Viability in Plants* Christy A. Brigham,2003-03-24 Persistence threats pathogens herbivores interactions fragmented landscape extinction habitat disturbance restoration *Biology and Conservation of the European Sturgeon Acipenser sturio L. 1758* Patrick WILLIOT,Eric Rochard,Nathalie Desse-Berset,Frank Kirschbaum,Jörn Gessner,2011-08-24 The book aims at synthesizing our current knowledge of *Acipenser sturio* and its management This species one of the most widespread sturgeon species all over

Western Europe ranging from the Black Sea to the Baltic is now on the verge of extinction Major aspects of its biology and management including mismanagement are provided in a historic perspective Similarly the changes in the restoration programs in situ and ex situ initiated in France and Germany are presented As the species occurred in sympatry with *Acipenser oxyrinchus* in Germany and Poland and very recently in France as well a brief outlook on restoration management programs of *A. oxyrinchus* are also provided for both North America and Northern European countries namely Germany and Poland As conservation restoration actions go beyond scientific issues non governmental stakeholders and marine professional fishermen s organizations have also been asked to contribute and the key role of a French German cooperation plan is underlined A part of the book is devoted to perspectives Illustrations of the European sturgeon mainly in photographs but also in stamps and paintings are presented

Conservation Biology Fred Van Dyke, 2008-02-29 Fred Van Dyke s new textbook *Conservation Biology Foundations Concepts Applications* 2nd Edition represents a major new text for anyone interested in conservation Drawing on his vast experience Van Dyke s organizational clarity and readable style make this book an invaluable resource for students in conservation around the globe Presenting key information and well selected examples this student friendly volume carefully integrates the science of conservation biology with its implications for ethics law policy and economics

Ecology Robert E. Ricklefs, Gary Miller, 2000 See publisher description

Population-Level Ecological Risk Assessment Lawrence W. Barnhouse, Wayne R. Munns Jr., Mary T. Sorensen, 2007-09-25 Most ecological risk assessments consider the risk to individual organisms or organism level attributes From a management perspective however risks to population level attributes and processes are often more relevant Despite many published calls for population risk assessment and the abundance of available scientific research and technical tool

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