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Book review

A Practical Guide for Genetic Management of Fragmented Animal and Plant Populations

By R Frankham, JD Ballou, K Ralls, M Eldridge, MR Dudash, CB Fenster, RC Lacy and P Sunnucks
2019. Published by Oxford University Press, Oxford. 208 pp. Hardback, AU$146 Paperback, AU$60 Ebook,
ISBN 9780198783411

This is the concise version of the authoritative text book on the same subject (Frankham *et al.* 2017). To call it 'The Big Dummy's Guide' to this discipline would diminish the significance, relevance and importance of this work. It has been written for, but not limited to, students and practitioners (including administrators) of wildlife management. It has comprehensively condensed the most up to date studies in conservation genetics and presents them with actual examples in elegantly digestible clarity for those who may not have the time to pursue this complex discipline to a professional level.

In the Preface, and at the back cover of the book, the authors have laid out and elaborated on the reasons for addressing this long overdue topic. They identified the need for a paradigm shift among in- and ex-situ wildlife managers and breeders, from their ill-informed and unwarranted avoidance of encouraging and maintaining gene flows for fear of outbreeding depression. They emphasise the urgent need to embrace a more enlightened and holistic approach to encourage heterosis – to increase and enhance reproductive vigour and heterogeneity. It's all in the definition of biological species.

If you have this Guide, and by now some of the uniquely genetic terminologies, such as 'effective population size', are starting to bother you; there is a comprehensive glossary provided for your convenience.

This book contains nine chapters and a list of take-home messages emphasising the need for re-establishing or establishing gene flow in fragmented populations and that inaction is usually more harmful to small populations than any attempt at genetic rescue. The Introduction goes through the FAQs on the subject from a list of mathematical symbols with cross references and the IUCN definitions of endangeredness to the genetic consequences for small fragmented populations from global climate change. I also found the Appendix that is available on-line useful and informative.

Chapters provide figures and boxes with exquisite graphics for your enjoyment as you plough through and digest the various complex genetics concepts and principles in thoughtfully well laid out chapters.

The publication of this Guide is particularly timely. With the recent extensive natural disasters occurring globally, I can only hope that returning to 'business as usual' is no longer an acceptable option. Chapter 9 goes into the effects of climate change and emphasises the imperatives for genetic management for increasingly fragmented and isolated populations. Since this book was launched, this urgency has been elevated to a critical level on the Australian continent as over 18 million hectares of land, representing some of the most iconic terrestrial ecosystems, has been lost to bush fires – and with diminished surviving wild plant and animal populations now even more fragmented and isolated.

I recommend this Guide to anyone who has any interest in breeding or managing wildlife in this challenging time. The message: you need to, and have to, also consider the genetics.

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Reference

Frankham, R., Ballou, J. D., Ralls, K., Eldridge, M. D. B., Dudash, M. R., Fenster, C. B., Lacy, R. C., and Sunnucks, P. (2017). 'Genetic Management of Fragmented Animal and Plant Populations.' (Oxford University Press: Oxford.)