

from this as well as the other two books discussed how poverty and environmental degradation reinforce each other and how both are promoted by current models of economic development and inequalities in access to resources. Moreover, the books demonstrate that the governments by themselves can play only a limited role in the greening of the degraded lands and the conservation of the remaining forest cover in the developing countries. Clearly the growth of local grassroots organizations must be accelerated.

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The Imperfect Art of Reintroduction

Meant To Be Wild: The Struggle to Save Endangered Species Through Captive Breeding. 1991. DeBlieu, J. Fulcrum Publishing, Golden, Colorado. 302 pp. \$24.95.

Beyond Captive Breeding: Reintroducing Endangered Species Through Captive Breeding. 1991. Gipps, J. H. W., editor. Zoological Society of London Symposia 62. Clarendon Press, Oxford, England 284 pp. \$98.00.

Both of these volumes provide a clear sense of how very little is known about the best ways to successfully reintroduce captive-bred animals to their natural habitats. In most other respects, however, the two books are quite different. DeBlieu, a journalist, has produced a popular, anecdotal account of the ongoing captive breeding and reintroduction programs for several bird and mammal species, mainly North American ones. The volume edited by Gipps, Curator of Mammals at the

London Zoo, contains the proceedings of a meeting held in 1989 that attempted to provide a scientific overview of current knowledge regarding the reintroduction of captive-bred mammals.

DeBlieu has obviously devoted considerable time to site visits and interviews with many of those involved with various reintroduction programs, including those for the red wolf, the black-footed ferret, the California condor, the whooping crane, the Puerto Rican parrot. She uses a story-telling approach designed to make her work interesting to the general reader and often succeeds in giving the reader a good sense of what it was like to actually be present at, say, the first release of captive-bred red wolves to the wild. However, I often found the book extremely annoying (and imagine that many other scientists will have a similar reaction) because of her proclivity for unsubstantiated statements and her tendency to confuse opinion and fact.

Those seeking scientific information on what we know about reintroduction will be better served by the Gipps volume. No doubt it will be useful to have the available data on mammalian reintroductions assembled in one place. However, those familiar with the scanty scientific literature on reintroduction, such as the writings of Devra Kleiman and Mark Stanley-Price and the IUCN policy statement on reintroduction, will find few new ideas in this collection of papers. General chapters cover previous mammalian reintroductions and the role of IUCN/SSC Reintroduction Specialist Group (Stanley-Price), the activities of the IUCN/SSC Captive Breeding Specialist Group (Seal), a checklist of veterinary considerations (Woodford & Kock), suggested guidelines for reintroductions (Chivers), behavioral problems and postrelease training (Box) and the limited insights available from ecological theory (May). More specific chapters

deal with particular reintroduction programs: golden lion tamarins (Kleiman and colleagues), black-footed ferrets (Thorne & Oakleaf), red wolves (Moore & Smith), and desert ungulates (Dixon & colleagues, Gordon). I found these chapters tended to be the most interesting, perhaps because they were based on first-hand experience with a particular species.

There is considerable overlap in the material covered by different authors and many familiar topics appear in several chapters. Such recurring topics include the need for a feasibility study prior to a reintroduction, the desirability of eliminating the cause of the original population decline before undertaking a reintroduction program, the many problems likely to be encountered, the basics of small population biology and population viability analysis, and the need to regard every reintroduction as a research project as well as a management action. I often had the sense that I had surely read an individual paper somewhere before!

DeBlieu worries incessantly that captive-bred individuals and their descendants can never be truly "wild." Unfortunately, her frequent discussions of this point do much to muddy the water. First, it is not clear how she defines "wildness" and how she thinks scientists might measure it. Second, she fails to distinguish between genetic and non-genetic changes in captive individuals. The scientists she consults about this potential problem do little to clarify the issues. Some optimistically state that there is no problem; others more honestly reply that we just don't know much about the question. In the Gipps volume, Seal identifies this fear "that the effects of captivity are permanently detrimental to return to the wild" as one of the main objections raised by those who oppose captive propagation. He correctly points out that these opponents "commonly rely on anecdotal

dotal information, are not numerate, do not specify sources, generalize extensively without reviewable evidence, and depend heavily on pejorative attacks on individuals, their analyses and their presentations." However, neither Seal or any of the other contributors to the Gipps volume attempts to deal with the question of the possible long-term effects of captivity on behavior, physiology, and morphology in a scientific fashion. Surely the question could be posed in scientific terms and some insights gained from a consideration of studies on feral animals, the bio-

logical control literature (Myers & Sabath 1981), and other sources. Here is a review paper that needs to be written.

In sum, neither of these books does much to advance our thinking about the problems of reintroducing captive-bred animals. Perhaps it would be unreasonable to expect a journalist's efforts to achieve such a goal. The lack of scientific substance in the Gipps volume, however, suggests that either it was somewhat premature to organize a symposium on the subject of reintroduction or that those with new material to contribute were unable to attend.

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Literature Cited

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