

Carnivores: renaissance enigma?



Carnivore Conservation

edited by J.L. Gittleman, S.M. Funk, D. Macdonald and R.K. Wayne. Cambridge University Press, 2001. £34.95 pbk (xiii + 675) ISBN 0 521 66537 X

In a provocative introduction to *Carnivore Conservation*, the editors argue that carnivores are special and deserve the disproportionate resources and attention that they receive because they are a 'renaissance taxa – involving a synthesis of conservation problems, causal factors, and solutions'. However, in Part 1 (Problems), Purvis *et al.* expose the enigma that carnivores represent for conservation biology. They are not particularly diverse, have shown periods of very high extinction rates with repeated taxonomic replacement (especially to fill the hypercarnivore morphotype, or the 'cat-gap'), and show small size to be advantageous in the fossil record. (The authors do express concern, however, that current extinctions are not random processes.)

Carnivores also present problems for the conservation of other taxa because they are so good at what they do. MacDonald and Thom, and Boitani reveal the negative impact that introduced carnivores have on native prey. Invasive carnivores are usually small (e.g. cats, dogs and mongooses) and successful, more so than is expected by the common 10s rule. Although this might make us feel that they should be eradicated, in light of Purvis *et al.*'s comments, these smaller, adaptable carnivores are probably responsible for the longevity of the Order.

The importance of bottom-up control for carnivores is reviewed by Fuller and Seivert (60–80% of carnivore density variation can be

explained by prey biomass). By contrast, Creel *et al.* and, to a lesser extent, Woodroffe expose the few (but increasing) examples of how large carnivores affect the dynamics of smaller carnivores, such that mesocarnivores disappear from ecosystems that favor dominant competitors. This idea is important for two reasons. First, it directly opposes the commonly held notion (proposed in Chapter 1) that other species should flourish where large carnivores persist, because large carnivores require large reserves and give stability to ecosystems. Second, carnivores killing carnivores is a significant challenge for ecosystem conservation, especially when both species are endangered.

In Part 2 of *Carnivore Conservation* (Some Approaches and Solutions), Clark *et al.* highlight the importance of humans in conservation programs – without public support, these programs are more prone to failure. Sillero-Zubiri and Laurenson point to the importance of moving away from a protectionist attitude to one of community involvement, especially in the Developing World where problems associated with poverty are often at odds with conservation objectives. These chapters expose the greatest challenge for carnivore conservation, because the increasing human population will result in increased conflict with carnivores, especially large ones. The remaining chapters are primarily reviews of the state of the field, including a thorough evaluation of carnivore re-introductions; a sobering summary of when it is appropriate to use new microsatellite techniques; and a rather traditional, slightly lacking, chapter on monitoring terrestrial carnivores.

The final part of the book (Prospects for Research and Conservation) is somewhat interchangeable with the previous section. Frank and Woodroffe's chapter linking conservation to animal behavior has interesting information but no summary of the field to date. Funk *et al.* provide an

interesting link to behavior by exploring how wildlife diseases are influenced by carnivore sociality, and Waser *et al.* review the use of genetic techniques to estimate dispersal. This is particularly relevant, because we know very little about long-distance dispersal in most carnivores even though current conservation thinking relies on dispersal between isolated reserves for species survival. Ginsburg follows with a critical review of priority-setting regimes (hot-spot models, ecoregional models, red data books, etc.) and calls for a more integrative approach, because carnivores, with their often very large home ranges and low diversity per area, do not fit into the current global priority-setting regimes.

Three themes emerge in this book. First, from an ecological perspective, Chapters 3–5 express serious concern over the negative impact that large carnivores have on smaller carnivores in small, disconnected reserves. This might be exacerbated by crowding animals into isolated reserves that lack different habitat mosaics. Second, from a management perspective, three chapters (9,11,13) are devoted primarily to the importance of social science and human dimensions in saving carnivores. Attitudes toward carnivores have changed, with urbanites largely promoting conservation whereas ruralists see the potential for increased conflict. Carnivores are simultaneously a symbol of a healthy ecosystem and a threat to livelihood. Finally, four chapters (7,14,15,22) concern the use and continued development of molecular genetics as a tool for carnivore conservation. This field is advancing rapidly, continuously providing new insights into species biology and management.

Given its interdisciplinary approach, it is surprising that *Carnivore Conservation* lacks any discussion or evaluation of the state, influence or role of population modeling as a tool for conservation. Although the 'ecosystem approach' is now in vogue, carnivore conservation often still relies on the ability to

measure and predict animal population sizes, trends and status.

I am not convinced that carnivores embody a synthesis of problems and solutions. General rules or protocols about how to conserve all carnivores do not emerge. Rather, the complex, multidimensional, and often contentious nature of carnivore conservation is exposed in a realistic and refreshing fashion. Mega-, meso-, and small carnivores often occur in ecosystems together and simultaneously have different threats, different ecological requirements, opposing population regulation factors, and different public perceptions. We are unfortunately left to deal with the enigma on a case-by-case basis.

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