USGS
science for a changing world

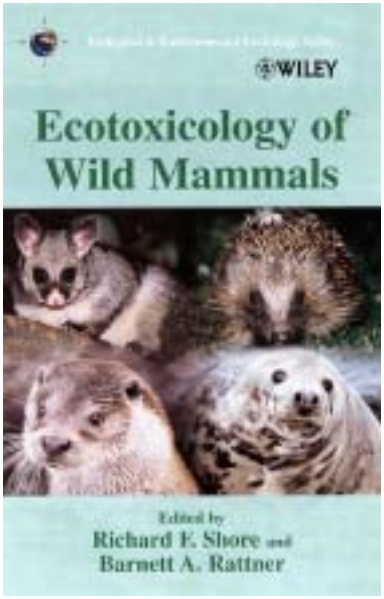
Patuxent Wildlife Research Center
Publication Brief for Resource Managers

http://www.pwrc.usgs.gov
Publication Brief PWRC 2003-01

Release:	Contact:	Phone:	Email:	Address:
February 2003	Dr. Barnett A. Rattner	301-497-5671	barnett_rattner@usgs.gov	12011 Beech Forest Rd. Laurel, MD 20708

Ecotoxicology of Wild Mammals

Ecotoxicology is the study of the effects of environmental pollutants on ecosystems, including prediction of effects of potentially toxic agents on non-target species. In this volume, an international group of 32 scientists has critically reviewed the scientific literature on exposure and effects of environmental contaminants in wild mammals.



Classic case studies have shown the effect of organochlorine pesticides on birds (principally raptors) but similar studies for mammals are lacking.

What we have learned:

- Marsupials and monotremes have been studied very little.
- Rodents (which comprise 43% of all mammal species) have been studied extensively but are comparatively tolerant to many organochlorine compounds, rodenticides, and even radionuclides.
- Insectivores (including shrews and some bats) whose daily food consumption constitutes high percentages of their body weight are at greatest risk of exposure.
- Aquatic mammals tend to bioaccumulate tremendous burdens of contaminants although storage in their fat depots may actually limit toxicity.
- Carnivores appear to be more sensitive to adverse effects of environmental contaminants than herbivores.
- Very few of the thousands of compounds manufactured worldwide have been toxicologically evaluated in wild mammals, and concentrations of even fewer have been monitored in tissues.
- Environmental contamination is only one of many stressors that affect wild mammals. Programs in the United States and Britain that monitor mortality indicate that 15-20% of mammals succumb to contaminants - which is lower than for birds.
- Number of mammals killed for sport, fur harvest and by disease and predation, is orders of magnitude greater than the number reported dead from direct effects of toxic chemicals.
- While contaminants have the potential to affect local populations, they generally appear to have less effect on larger populations.

It seems clear that we are still a long way from understanding the population, community, and ecosystem consequences of environmental contaminants on wildlife. This is the exciting challenge facing us at the dawn of the 21st century.

Text Themes:
What exactly do we know about environmental contaminants in mammals?

What are the commonalities and differences between mammal orders/species in the effects that contaminants have?

How and to what degree of accuracy can we predict the adverse effects of environmental contaminants on mammalian wildlife?

How significant are contaminant insults compared with other density-independent and -dependent factors such as habitat loss, climatic factors and disease?

Shore, R.F. and B.A. Rattner (Editors). 2001. Ecotoxicology of Wild Mammals. Ecotoxicology and Environmental Toxicology Series. John Wiley and Sons, Ltd. New York. 730 pp.