

The methodology used to arrive at impact figures presented in this report has been deliberately conservative. No attempt has been made to audit the impact of pest animals, and commentators should be cautious not to present the figures as such. No attempt has been made to cover every species and even a superficial consideration of bird damage, for example, would no doubt show impacts in the tens, if not hundreds of millions of dollars when one considers crop damage and infrastructure costs. No attempt has been made to gather new impact data and therefore some of the estimates provided necessarily reflect the limitation of information available to the author. In most cases, damage figures have not been extrapolated from site-specific studies across larger areas. To do so leaves the report open to criticism of possible overestimation or exaggeration. Therefore, the reader should look behind the figures provided to understand why some pest animals, such as the common carp, have been assigned a relatively low impact figure. The low figure may reflect a lack of available data.

Little impact in terms of dollar value has been contributed from the social impact of pest animals. Few studies, if any, have attempted to assign dollar values to the social impact and therefore they are reported here as low. Again the commentators should be cautious in drawing conclusions. Time and again, anecdotal accounts of social impact are recounted. Farmers forced to stay up at night to guard flocks or those faced with mutilated animals clearly are impacted by this experience. Those that live through a mouse plague remember it for life. This report does not capture dollar figures from these types of social impacts and it may be appropriate for future studies to try to do so.

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Pest Animal Control CRC

Counting the Cost: Impact of Invasive Animals in Australia, 2004

Executive Summary

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Executive Summary

The economic, environmental and social impact of 11 major introduced vertebrate pests of Australian agricultural industries and the environment, are estimated in this desk-top review. This provides a 'triple bottom line' national perspective on vertebrate pest animal impact. Pests were selected on the basis of relevance to current and potential Pest Animal Control CRC research activities, and in consultation with centre staff. Annual cost values include control and production loss estimates. Many gaps exist in our knowledge of the major environmental and social impacts vertebrate pests have, therefore these impacts are discussed for each pest in qualitative terms. However, where quantitative impact information is readily available it is also included.

Table 1: Annual impact of pest species (order of cost)

	Total	Triple bottom line impact					
		Economic		Environmental		Social	
		Impact	\$m	Impact	\$m	Impact	\$m
Fox	227.5	◆	37.5	◆	190.0	◆	nq
Feral cats	146	◆	2.0	◆	144.0	◆	nq
Rabbit	113.1	◆	113.1	◆	nq	◆	nq
Feral pigs	106.5	◆	106.5	◆	nq	◆	nq
Dogs	66.3	◆	66.3	◆	nq	◆	nq
Mouse	35.6	◆	35.6	◆	nq	◆	nq
Carp	15.8	◆	4.0	◆	11.8	◆	nq
Feral goats	7.7	◆	7.7	◆	nq	◆	nq
Cane toads	0.5	◆	0.5	◆	nq	◆	nq
Wild horses	0.5	◆	0.5	◆	nq	◆	nq
Camels	0.2	◆	0.2	◆	nq	◆	nq
Total	719.7		373.9		345.8		

nq = not quantified ◆ = bigger impact ◆ = smaller impact

Major control costs included in the economic impact assessment included baiting, fencing, shooting, and research associated with the improved management of the specific species. Production losses were estimated for sheep, cattle and cropping industries as a result of predation on young stock, crop damage and competition for feed. In addition to these agricultural losses, public sector research and management costs were included in the economic cost section.

Environmental impacts were typically based on the vertebrate pest's impact on biodiversity. Where possible, these impacts have been quantified in cost terms, although it should be noted that accurate information relating to ecological cause and effect relationships, along with the communities' valuation of species preservation are not readily available. Environmental valuations were undertaken for feral cat, fox and carp impacts, as data was in evidence for these species.

The cost impact of the 11 species subject to assessment totalled \$720 million per year. Feral pigs, rabbits, foxes and feral cats were estimated to account for 83% of losses and agricultural productivity loss accounts for about half of total costs estimated.

Identified issues and recommendations

The main purpose of the consultancy was to estimate the social, economic and environmental impacts of major vertebrate pests. This is the first time 'triple bottom line' reporting, suggested in reports such as the Global Reporting Initiative's *Sustainability Reporting Guidelines* and Environment Australia's *Triple Bottom Line Reporting in Australia*, has been used to assess pest impact. In addition to summarizing the triple bottom line results, some points for future research have been outlined.

- Economic costs associated with competition by pests with sheep and cattle were the most straight forward impacts to derive, due to a large range of grazing experiments and previously conducted impact assessments. Economic impacts derived in this study are well below those previously calculated – largely due to contraction in the size of the national sheep flock and in the case of rabbits, the release of rabbit calicivirus (RHDV), which has decreased rabbit population pressures in many areas.
- Rabbits, foxes, feral pigs and feral cats were shown to inflict the greatest cost impact on the Australian economy. In the case of rabbits and pigs, the major component of the impact comes from reduced agricultural production, principally in the sheep and cattle industries. Given the heavy impact these pests impose on these industries, collaborative research projects should be sought with sheep and cattle producers, as they would be the major beneficiaries of such research.
- Feral cats and foxes were estimated to inflict large costs associated with predation of native fauna. In the absence of specific data specifying the Australian community's valuation of this impact, 'per bird killed' cost estimates were assumed for the analysis reported in Pimentel *et al.* (2000) and using analyses taken from the NSW EPA database. Given the large impact of this assumption, it is essential that survey work be conducted in Australia to determine community attitudes to the impact of fox and cat predation so more accurate of definition of loss can be determined.
- Social impacts were the most difficult impacts to estimate. The Global Reporting Initiative guidelines suggest that social performance measurement enjoys less consensus than environmental performance. Within this report, pest impacts on employment, health and indigenous peoples ways of life are documented in relevant sections. Only the costs of vehicle accidents associated with kangaroos are quantified, while the commercial use value of differing species are outlined.
- Although not regarded as a pest to the general Australia community, kangaroos inflict significant costs on grazing industries through pasture competition and damage of fences. These costs are substantial and comparable with other vertebrate species that inflict large losses within grazing industries. Given this large impact, along with traffic crash costs and substantial tourist and commercial resource value of kangaroos, it is desirable that the issue of population density management be assessed further and management tools devised to minimise costs and maximise the benefit of this national symbol.
- Despite inflicting a major impact, research into managing all of these pest species may not necessarily deliver the greatest benefit. Research projects need to be assessed in terms of their ability to reduce the overall cost of a pest species, along with risks of the investment generating an outcome. Benefit-cost analysis could be used to derive estimates of each projects expected economic pay off – as measured by a project's net present value (the difference between project benefits and costs) and benefit-cost ratio (the ratio of all project benefits to all project costs).

