8. Deficiencies in knowledge and practice

Summary

Although there is much knowledge about the ecology, behaviour and effects of predation by dingoes and other wild dogs, some topics require further research to enable best practice management to be implemented. There are also knowledge deficits relating to the conservation of dingoes, the effects of control programs on populations of non-target animals and the interactions between wild dogs and feral cats, foxes and native carnivores. These knowledge deficiencies are not listed in priority order.

8.1 Assess relationship between wild dog abundance and predation of cattle

Deficiency

A poor understanding of the relationship between wild dog density and the predation of cattle in extensive cattle areas.

Developments required

Measurement of predation of cattle and wild dog density is required in different regions. This can be done during normal wild dog control programs. As for sheep enterprises in the eastern highlands, the costs of the 'no dog control' option requires evaluation (Section 7.3.4).

Consequences

If consistent relationships exist between wild dog density and predation of cattle, marginal analyses have more credibility and become very useful in best practice management. Negative relationships between cattle predation levels and wild dog density would indicate that control of wild dog populations was disadvantageous and should be discontinued and alternative strategies used, or that control should be coordinated over larger areas.

8.2 Assess relative effectiveness and efficacy of baiting strategies

Deficiency

The relationship between the cost of control (particularly aerial and ground baiting) and the impact of wild dog predation on the profitability of livestock (particularly sheep) in the eastern highlands is unknown. This knowledge is essential for decisions about the continuing expenditure on wild dog control, dingo conservation and the suitability of some lands for grazing enterprises. If possible, areas where no wild dog control is exerted should be incorporated in the assessments so that the costs of the 'no dog control' (Section 7.3.4) option can be evaluated and benefit–cost ratios of different control programs can be compared against no action.

Developments required

Experiments to evaluate the relative costs and benefits of the various methods of wild dog control.

Consequences

Improved management decisions relating to wild dog control, conservation and the profitability of grazing enterprises. If the relationships between wild dog density and predation are tenuous or highly variable, the continued use of all control strategies that reduce dog abundance in sheep areas are justified provided they fall within budget allocations.

8.3 Assess effect of Rabbit Calicivirus Disease on dingo predation of livestock

Deficiency

The introduction of rabbit calicivirus has had a varied impact on rabbit numbers with the greatest reductions being in arid and semi-arid areas (rainfall less than 300 millimetres). The effect of reduced abundance of rabbits on wild dog predation of cattle and native animals and on wild dog population abundance is poorly known.

Developments required

The interaction of rabbit calicivirus on rabbit populations and the subsequent effects on wild dog predation of cattle and native animals requires research.

Consequences

Prey abundance may be an important indicator of the probability of wild dog predation of livestock. If so, understanding of predator–prey relationships and the effects of Rabbit Calicivirus Disease on rabbit populations is essential.

8.4 Investigate feasibility of compensation schemes for wild dog predation

Deficiency

A self-funding insurance or compensation scheme has been suggested to reimburse landholders for livestock losses. Such schemes could be a substitute for control or an adjunct to reduced levels of control. The feasibility and function of such schemes has not been investigated.

Developments required

The feasibility and operation of self-funded compensation schemes require investigation under different agricultural systems where wild dogs occur.

Consequences

Determination of the likely success of compensation or insurance schemes as an alternative management strategy for wild dogs.

8.5 Train vertebrate pest control operators and managers

Deficiencies

There is a need for training packages to inform field operatives and managers of the strategic approach to wild dog management and the conservation issues relating to hybridisation.

Developments required

The information contained in this book provides a starting point for the development of training packages for field operatives and managers. These should be continuously updated to account for changes in legislation and new research findings.

Consequences

Soundly-based management will be implemented and the results of new research will be incorporated into management plans.

8.6 Improve public awareness of agricultural production, conservation and animal welfare issues for wild dog control

Deficiency

Public perceptions of vertebrate pest control programs are often based on incorrect premises or worst-case scenarios. Many people are not fully aware of the range of agricultural and conservation reasons for wild dog control. There is also misinformation about the use and safety of poisons, and in particular the characteristics of 1080 (sodium fluoroacetate) (Sections 4.2.4 and 6.4.4) that make it the poison of choice for controlling wild dogs. Although considered a humane

poison by many researchers and managers, there is a perception by many in the wider community that 1080 causes painful deaths. There is increasing community interest in the need for, and humaneness of, control techniques used on pest animals. These issues require extension to the broader community.

Developments required

Education and media programs to extend information on the welfare issues of wild dog management. Include animal welfare issues associated with wild dog control in school curricula.

Consequences

More techniques for management of wild dogs that include non-lethal strategies will be available.

Better informed public debate about the conservation, livestock production and animal welfare issues relating to the management of wild dogs.

8.7 Develop species-specific and more humane control techniques for wild dogs

Deficiency

The increasing interest of the wider community in animal welfare requires that more humane methods of control for pest animals be continually investigated. For example, the use of strychnine on trap jaws is the presently accepted and recommended method for minimising the suffering of dogs held in traps. Strychnine causes a quick yet painful death.

Developments required

Development and monitoring of new and improved techniques to minimise or eliminate the potentially adverse effects of control measures on the welfare of wild dogs and non-target animals is needed. For example, a fast-acting more humane poison for use as a substitute for strychnine on trap jaws requires investigation. The economic viability of new techniques will need to be assessed.

The use of deterents to minimise interactions between wild dogs and people is untested. Alternative management tools such as livestock guarding dogs and toxic collars have been tried in other countries but their application and benefit–cost analyses for Australian conditions are unknown.

Consequences

Ongoing assessment and improvement of animal welfare aspects of wild dog control. The most humane methods of control will be used for managing wild dogs and the welfare of non-target animals will not be compromised during control programs.

8.8 Assess economic importance of hydatids in wild dogs

Deficiency

The relationship between wild dog populations and the prevalence of hydatidosis (causal agent *Echinococcus granulosus*) in livestock has not been fully investigated. At local levels, it is known that hydatidosis in cattle is sometimes associated with grazing lands adjacent to or within country inhabited by wild dogs; however full epidemiological studies have not been completed. The economic importance of hydatid infection in livestock remains unclear and strategies to prevent or reduce their occurrence are yet to be formulated.

Developments required

Research is needed to estimate the economic importance of hydatid infection in wild dogs and associated livestock.

Consequences

Development of strategies to prevent or reduce the occurrence of hydatid infection in wild dogs and livestock.

8.9 Assess the role of disease induced mortality in wild dogs

Deficiency

A poor understanding of disease and parasite-induced mortality in wild dogs.

Developments required

The role of various parasites and diseases on the mortality of wild dogs and the impact of this on population dynamics in different environments requires research.

Consequences

A better understanding of disease and parasite-induced mortality in wild dogs.

8.10 Assess the role of wild dogs if rabies were introduced

Deficiency

A question that is raised by the fact that dingoes came to Australia from Asia is, 'Why is there no rabies (Rhabdoviridae) in Australia? What is different here compared with similar habitats and fauna types in Asia?'

Developments required

Modelling using demographics and estimates of rabies transmission coefficients will provide useful indicators of the likelihood of rabies becoming established in wild dog populations. Further research is needed on the demographics and interactions of commensal dogs and wild dogs in the more settled areas of eastern Australia and in northern Australia.

Studying the ecology and demographics of dingoes in Asia will assist in understanding why rabies is not endemic to Australia or what to do if it is introduced to Australia.

Consequences

Understanding the ecology and demographics of dingoes in Asia will assist in rabies contingency planning.

8.11 Assess risks to non-target species of 1080 poisoning

Deficiency

Although there is evidence indicating that the poisoning of wild dogs with 1080 is likely to have little impact on non-target populations, this requires confirmation in eastern Australia. The potential impact of 1080 baiting for wild dog control on populations of non-target carnivorous species (including phascogales (*Phascogale* spp.) and spotted-tailed quolls, (*Dasyurus maculatus*)) is the main factor potentially limiting the use of 1080 (and particularly aerial baiting) to control wild dogs in eastern Australia.

Developments required

Scientific assessment of 1080 baiting programs on populations of non-target carnivorous native animals in a variety of environments. Investigation of the potential of alternative baiting strategies (bait substrate, placement of baits and timing of baiting) to reduce non-target risks.

Consequences

A scientific basis for improved risk management for non-target species in areas where wild dogs are baited.

8.12 Assess the ecological effects of wild dog control on feral cat and fox populations

Deficiency

There have been few investigations into the ecological relationships between feral cats, wild dogs and foxes (*Vulpes vulpes*). The effect of controlling wild dogs on the abundance of other predators requires further study.

Developments required

Research to assess the factors influencing the dynamics of feral cat and fox populations and the interplay of these factors with wild dog control. Relationships between wild dogs and these carnivores require research to enable better management for conservation.

Consequences

Best practice management of wild dogs, foxes, and feral cats can be based on scientific data rather than unsubstantiated assumptions.

8.13 Assess the interactions of wild dogs and native carnivore populations

Deficiency

Inadequate understanding of the interplay of wild dog control with the factors affecting populations of native carnivores, particularly quolls (*Dasyurus* spp.).

Developments required

Research to assess the factors influencing the dynamics of native carnivore populations and wild dog populations, and the interplay of these factors with wild dog control.

Consequences

Improved management for conservation of native carnivores in areas of wild dog control.

8.14 Assess effects of wild dog abundance on macropods

Deficiency

The control of wild dogs in forested areas of south-eastern Australia may have caused populations of kangaroos and wallabies (*Macropus* spp.) to increase with concomitant grazing impacts on agricultural and forestry enterprises. On some holdings, a balance is attempted between calf losses due to predation by wild dogs and the benefits that predation on macropods may have in reducing grazing pressure.

Developments required

Predator–prey relationships between wild dogs and their macropod prey require investigation in south-eastern Australia.

Consequences

Knowledge of predator–prey relationships in cattle country of south-eastern Australia will allow for management strategies that balance an acceptable abundance of macropods with acceptable level of predation of calves.

8.15 Assess the values of dingo conservation

Deficiency

Economic frameworks are needed to assist the community in meeting dingo conservation goals. Better management of budgets relating to the conservation of dingoes can only be achieved if the unpriced values of dingoes are estimated enabling marginal analyses and cost–benefit analyses of conservation strategies. The contingent and inherent values the community places on the conservation of dingoes have not been established.

Developments required

Establish the contingent and inherent values of dingoes to the wider community.

Consequences

Estimation of unpriced values of dingoes will enable marginal analyses and cost–benefit analyses of conservation strategies to determine the most cost-effective management strategies for meeting community conservation objectives.

8.16 Develop a method to identify genetically pure dingoes

Deficiency

If governments enact legislation to conserve dingoes (Section 5.3.3) while controlling other wild dogs, non-destructive methods to distinguish between dingoes and other wild dogs are required. For example, conservation programs on Fraser Island would require the capture of all wild dogs over time to enable their genetic purity to be assessed, with subsequent release or destruction depending on their genetic status. At present, there is no consensus applicable to the whole country on what constitutes a 'pure' dingo.

Developments required

Techniques to differentiate between dingoes and other wild dogs are being developed and the continuation of this work should be encouraged. A national decision must be scientifically made on what genotype and/or phenotype constitutes a pure dingo.

Consequences

Policy decisions and management strategies for conservation of dingoes depend on the ability to differentiate between subspecies of wild dogs. Without a method of differentiating that can be applied to live animals, conservation strategies are impossible to implement. A national policy on the genotype required for genetic purity will enable conservation to advance; without such a policy, dingo conservation is a lost cause.

8.17 Improve knowledge about genetics of wild dogs

Deficiency

Information on the taxonomic status of wild dogs throughout Australia is required, especially in climatically different regions where races of pure dingoes may occur.

Developments required

Public awareness of the issue of hybridisation, a rapid method of field assessment of pure dingoes, and strategies and techniques for the removal of hybrids and free-roaming dogs from areas of pure dingoes are required. The adequacy of refugia on islands and the mainland to allow populations of pure dingoes to be maintained naturally needs investigation.

Consequences

Genetic assessment of regional variations in dingo populations and self-sustaining populations of pure dingoes.

8.18 Assess the ecological role of dingo hybrids

Deficiency

Although the role of dingoes in central and northern Australia is understood, the role of wild dogs in eastern Australian environments is less well known. Also, it is unknown whether the increased proportion of hybrids will change the ecological role currently held by dingoes.

Developments required

Scientific investigations are required to understand the similarities and differences between dingoes and hybrids and whether these differences will alter predation rates on native fauna and livestock.

Consequences

If the roles of dingoes and hybrids are different, a new suite of management decisions will be required. Balancing the requirements for control and conservation in management plans requires knowledge of potentially different ecological roles of dingoes and other wild dogs.