Introduced pest animals and weeds in South Australia - why controls are necessary

# Introduction

Concerns about the climate and climate change, the environment, land and water management and conservation of native flora and fauna are all issues of early 21st century Australia. However, these issues also matched those faced by the European settlers who arrived here from 1836, although with differing emphasis and priority. The early settlers faced the task of establishing a new colony in a land that was relatively unknown to them – even those who were alert to the circumstances and difficulties being faced elsewhere on the Australian continent had to contend with the vagaries and subtle differences of that vast area that was christened South Australia. Further information concerning the Settlement and Development of South Australia is available on the History of Agriculture in SA website at <http://www.pir.sa.gov.au/aghistory/land_settlement_in_sa>.

Care of our land resources is vital for the economic well-being of South Australia. There is considerable potential for the State to underpin its economic development from primary industries by ensuring the adoption of sustainable land management practices. Conversely, economic development is essential if we are to improve our management of these land resources. Community interest in land management and resource protection is growing, as is shown by the increasing number of debates on the future of the arid zone, a greater interest in landcare, the proper management of water resources, pollution control, biodiversity, management of conservation lands, and related issues. A fundamental component of land management and resource protection is the control of pest animals and weeds.

Pest animals and weeds threaten the full potential, sustainability and benefits of agricultural, pastoral, industrial and public enterprises or works; conservation and biodiversity; and the health and safety of people. All livestock and plant production industries are at risk from the impacts of pest animals and weeds.

# Pest Animals

A ‘pest animal’ is usually a vertebrate animal that becomes established and poses a threat to primary industry, the environment or the community. They are also animals that cause more damage than benefits to human valued resources and social wellbeing[1]. Pest animals cause immense damage to our soils, native plants and animals, and account for annual production losses worth millions of dollars.

In the two centuries since European colonisation, many exotic animals have been introduced to Australia both legally and illegally. In mainland Australia, it is estimated that at least 73 species of introduced vertebrates have established wild populations, including 25 mammal species, 20 birds, four reptiles, one amphibian and at least 23 freshwater fish. Some introduced pests—such as rabbits and foxes—are now so widespread in Australia that there is now no prospect of eradication. This is because it is no longer technically feasible to do so as the huge area of the continent makes the initial and potential ongoing costs beyond the capacity of the country to fund. With the extent of global and local travel and trade, the risk of additional species being introduced is increasing. Changing climatic conditions may also alter the distribution and abundance of pest animals[2].

Introduced pest animals cost South Australian agriculture millions of dollars in damage, lost production and control efforts. In fact, the annual cost of pest animals to Australia was estimated to be $743.5 million in 2007-08[3] (costs to South Australia are not available). Rabbits damage sown crops, compete with domestic livestock for pasture and kill seedlings of native trees and shrubs, damaging natural ecosystems. Foxes and wild dogs prey on livestock causing severe losses especially to the sheep industry. Rabbits also support large populations of foxes and feral cats. Pest animals can cause land degradation by promoting soil erosion, stream turbidity, the spread of weeds, and can threaten native plant species and animals through competition, habitat destruction and predation (foxes have been implicated in the extinction of almost 30 native mammals from mainland South Australia). Pest animals also have the potential to act as reservoirs for diseases that affect native wildlife, domestic stock or people, eg wild dogs and feral pigs. Pest animals have considerable negative social impacts. The predation of livestock has significant social and psychological effects on primary producers and their families and feral deer and other large herbivores are a road hazard. In addition they are a nuisance, damaging infrastructure and culturally important sites, and displaying adverse behaviours such as disruptive noise.

Incursions of exotic animals continue to pose pest risks. Through illegal keeping (e.g. red eared slider turtle), accidental importation (e.g. Asian spined toad) and deliberate release (e.g. aquarium fish), Australia faces a new wave of potential pests.

# Weeds

At its simplest, a ‘weed’ is any plant growing where it is not wanted. In terms of government and land holder roles it is better described as a plant that requires some form of control action to reduce its negative effects on the economy, the environment, human health and amenity[4]. More than 27 000 exotic plant species have been introduced to Australia since 1788[5], and at least 2800 have subsequently naturalised: they establish and spread unassisted unless something is done about them. A 2003 report[6] determined Australia had around 426 major agricultural weeds and about 798 major environmental weeds. On examining the sources of agricultural, noxious, natural and environmental weeds, it appears that most were deliberately introduced to Australia: only around 7% came accidentally or for reasons unknown[7]. Most food and ornamental plants were planted deliberately; around 70% of weeds have come from gardens, although this only represents around 5% of plants introduced for gardening. Hence, whilst most weeds are originally garden plants, most garden plants do not become weeds.

Many introduced flora species have the ability to spread rapidly in South Australia, competing with native plants, preventing native vegetation from regenerating and modifying wildlife habitats. Yet while native flora and fauna are often in conflict with introduced species, some native animals, better able to adapt, use introduced plants as well as native ones[8]. About 900 alien species of plants have been introduced intentionally, misguidedly or accidentally to South Australia since 1836, mainly from Europe and South Africa[9]. A range of environmental and climatic factors enabled many of these unwanted plants to establish themselves in a diverse range of local conditions.

By the end of the 20th Century, annual losses to agricultural weeds in South Australia were approximately $650 million (while 10 years later in Australia it is $4 billion, $1.5 billion a year in control activities and a further $2.5 billion a year in lost agricultural production). They contribute significantly to land degradation, and reduce farm and forest productivity. Weeds limit crop and pasture growth to reduce yields and can contaminate products. Spiny weeds such as gorse, blackberry and wheel cactus can block stock access to fodder. Weeds typically produce large numbers of seeds, assisting their spread, and rapidly invade disturbed sites, such as cultivated paddocks and roadsides. Weeds can also contribute to soil disturbance[10].

Weed invasions change the natural diversity and balance of ecological communities. These changes threaten the survival of many plants and animals as the weeds compete with native plants for space, nutrients and sunlight and contribute significantly to land degradation. Many weeds, particularly those that invade bushland, rivers and coasts are escaped garden plants. The public safety and welfare risks can also be significant but are difficult to quantify. For example, increased fire risk from dense weed thickets and reduced amenity access, such as aquatic plants covering waterways and large thickets of blackberries restricting movement.

# The need to take action

Concerted action is necessary to eliminate or control a pest, because if left uncontrolled it will have an impact on crops and stock or even overtake a local eco-system. Yet whatever drastic steps might be taken, new control tool implemented or preventative procedures adopted to make a situation less likely to recur, there are contradictions and tensions in any method of pest animal or weed control. For example, dingoes are both a protected species in certain areas and a pest that needs to be controlled in others. Feral deer and goats are often sourced from farmed animals. Blackberries can form dense thickets providing cover for both pest and native animals and a food-source for many native birds.

Throughout Australia, many pest animals and weeds are spreading faster than they can be controlled and their management is consuming enormous resources. Climate change poses an additional challenge to our ability to manage these pests. Some pests will be determined as not cost-effective to be pursuing, others will be pursued at a State level and some will be national threats. More and faster than ever before, we can use technology for detection and control, although pest animals and weeds are rarely able to be completely eliminated. For better or worse they can be managed and controlled, but the consequences of these measures still need to be considered carefully. Therefore, science, economics and politics need to coalesce in reaching a decision about striking the optimum balance. Risk assessment is used to determine the pest potential of new animal and plant introductions to Australia.

# Legislation

Agriculture was of critical importance to the prosperity of the colony and Government intervention in its development and protection was necessary soon after settlement to ensure it would continue to expand and flourish. In this regard, pest animals and weeds became matters of public concern, and arrangements to deal with them varied as they assumed greater or lesser importance. Later, declining biodiversity and the extent and pace of development led to a reassessment of values and ideas, resulting in changes in attitude and behaviour to pests in the natural environment. Effective control of pest animals and weeds by all landowners was considered to be the key to reducing their impacts andfundamental to sustainable land management as well as environmental and community values.

Legislation was passed to deal with pest animals and weeds, although not all of these were legally defined as such at the time. For example, the *Crown Lands Consolidation Act 1886* provided for the erection of rabbit-proof and vermin fences (see list of South Australian Acts relating to the control of pest animals and weeds from 1837 to 2003). South Australia has been a leader in passing legislation for the control of pest animals and weeds. The *ScotchThistle Act 1851* was the first weed control legislation in Australia. The *Rabbit Destruction Act 1875* was the first rabbit control legislation in Australia. As far as we can ascertain, both were the first such legislation in the world. The *Dogs Act 1852*, the first of a series that confronted the nuisance caused by uncontrolled domestic and native dogs,was a precursor to what eventually became the *Dog Fence Act 1946*. But such statutes were, in a sense, negative, in that they were designed to prevent certain things from happening rather than taking direct steps to improve conditions positively.

Between 1837 and 2003 there have been 130 Principal or Amendment Acts in South Australia relating to the control of pest animals and weeds. This includes Acts targeting individual species through to a single scheme that integrated pest animal and weed control. Acts to control certain individual species were introduced, such as for thistles, dogs, horses, camels and sparrows, but these species were soon merged with others into more general Acts as the number of pest species grew. Paradoxically, between the 1870s and the 1920s there were Acts that prevented the destruction of what were to become introduced pest animals, such as pheasants, sparrows, deer, rabbits, blackbirds and starlings. These were Acts for the Protection of Animals (and later birds) and for Game. In total, there were 13 Principal or Amendment Acts for these purposes.

To administer this legislation, responsibility for implementation was vested first with the central Government, then later with local councils and finally with dedicated local boards (for details see the chronological period histories relating to the control of pest animals and weeds).

# Sources of information

[1] Australian Pest Animal Strategy 2017–2027

[2] Australian Pest Animal Strategy 2017–2027

[3] Invasive Animals Cooperative Research Centre

[4] Australian Weeds Strategy 2017–2027

[5] John Virtue at the APCC conference 2005, citing work by Rod Randall in the Weeds CRC.

[6] Groves et al. 2003 Weed categories for natural and agricultural ecosystem management. BRS Report

[7]Info from Rod Randall in Western Australia

[8]Aslin in Nance & Speight, p. 59.

[9]*Atlas of South Australia* (1986). Text from SA Central website, 17.1.2008.

[10] <http://www.environment.gov.au/biodiversity/invasive/weeds/> accessed 22.7.2018

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