PO Box 1803

Armidale, 2350

New South Wales


27 May 2016


Ms Jenny Mannering

Inquiry Secretary

Legislative Secretary

Parliament House

Hobart  Tasmania        7000


Dear Ms Mannering

**Re: Legislative Council Inquiry into the Wild Fallow Deer Population in Tasmania**

By way of introduction please can I outline that I was the former Senior Game Management Officer of the Tasmanian Game Management program within the Department of Primary Industries, Parks, Water and Environment (1997 - 2009). I also:
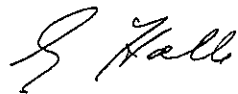
- Co-developed the only tertiary game management course in Australia at the University of Queensland (2006),

- Am a member of the Australian Deer Research Foundation (2000 – present),

- Co-wrote the only book on the management of wild deer in Australia (2007),

- Was a member of the Victorian Hunting Advisory Committee (2009 – 2013),

- Currently sit on the Ministerial-appointed Game and Pest Advisory Board in New South Wales (2013 - present),

- Am a member of the IUCN Sustainable Use and Livelihoods Specialist Group (2013 - present),

- Am the only Australian who has been awarded a Churchill Fellowship to study game management (including deer management) overseas (1999),

- Am currently a Certified Wildlife Biologist with the Wildlife Society (2005), and a Fellow of the Linnean Society (2006), and

- Was an adjunct Associate Professor at the University of New England in New South Wales (2012-2016).

In the above context I offer the following comments on the Terms of Reference of the Inquiry into the Wild Fallow Deer in Tasmania.

If the Inquiry would care to ask any questions about my private submission I can be contacted at ghall20@une.edu.au or by phone on 02 6773 3179.


Yours sincerely

Dr Graham Hall

# Responses to the Terms of Reference

## Term of reference:        Environmental impacts on public and private lands

There is little doubt that forests and woodlands are browsed and grazed by many mammals including possums, wallabies, sheep and cattle, hares and rabbits – and deer are just another mammal group amongst these other species. From germination or planting until they are 3-4 years old, young plants are susceptible to browsing by deer – as is coppice regrowth from stumps. Even when the terminal buds are high enough to be outside of browsing range, damage may be caused to woody stocks by animals climbing on them or by male deer rubbing and 'thrashing' their antlers. Mature trees may be subject to bark-stripping damage by male deer trying to clean or polish their antlers. Such damage may kill the tree outright, allow the entry of fungus through the wounded tissue, or cause the recovering tree to grow in an undesirable shape. This damage to the trees also applies to the shrubs and understorey, but the question is does it relate to economic damage?

There is very few published data on the true economic significance of deer on the forestry industry because most studies have concentrated on documenting any damage rather than quantifying the cost of that damage (Maxwell 1967, Welsh et al 1991, Wray 1994). However, this is quite different to suggesting that browsing is without economic cost.

Deer are also blamed for causing damage to the agricultural industry – from horticulture and field crops to pastures. Studies in the UK show that Red, Roe and Fallow deer graze on forage crops and impact on pasture, silage yields and early growth of cereals (Putman and Moore 1998). Whilst no similar records are published for deer in Tasmania, it would be naive to think that large concentrations of deer on paddocks are not causing damage.

If we accept that in some circumstance deer do have the potential to cause economic damage, the question then is – how do we quantify the size of that damage? An extra challenge is to tease out the economic damage of the deer from the damage of the other browsing or grazing species. To date there are no credible published studies that report on the economic cost of deer in Australia *per se*, and particularly Tasmania.

Curiously, given the alleged damage of deer to crops, in a survey conducted in the UK only about ⅓ of respondents considered losses as significant, and 85% assessed the significance of the loss at ≤ £500 per annum for the whole farm (Packer et al 1999).

This result was similar to another UK study that demonstrated 30% grazing to an entire crop of cereals, yet this was of no economic impact at harvest (Putman 1986). The timing of browsing and grazing relative to the growth stage may provide a different outcome. Putman (1989) demonstrated that when cereals are grazed continuously, reductions in grain yield at harvest are recorded.

The clear message is that grazing damage *per se* is not necessarily proportional to economic loss. The low economic cost of grazing demonstrated in the UK has also been reported in the Czech Republic (Orbitel and Holisova 1983), Poland (Kaluzinski 1982) and Sweden (Putman and Kjellander 2002).

Deer damage to orchard crops has been reported in the USA. For example, in Ohio fruit growers reported that White-tailed deer damaged 41% of fruit orchards, and damage was estimated at US$204/hectare (Scott and Townsend 1985). The majority of damage was caused by browsing of vegetative parts rather than damage to tree stems and fruit.

## Deer Damage on Conservation Areas

This topic is one of the most sensitive areas when we come to exploring the management of deer in Australia – firstly because browsing and grazing ungulates such as deer have, through evolutionary times, been fundamental to shaping the structure and dynamics of vegetation communities world-wide and, secondly, because most of these ungulates did their browsing and grazing in vegetation communities away from Australia! This not to say that Australian vegetation communities have not been browsed and grazed, but just not by deer.

In most areas of the world the density of herbivores is relatively low, and density-dependant mechanisms and plant-evolved protection dictate the impacts that these species can have on the vegetation – both on the individual plant and at the community level. For example, it is considered that the wider herbivore community generally consumes only 5-10% of the above-ground primary plant production, and the large species (like deer) consume much less than this amount.

The problem comes when the animals doing the eating are not native to the environment, and the plants being eaten are 'naive' in how to cope with being browsed or grazed by the exotic animals. For example, in Australia kangaroos and rabbits provide good examples of the contrasting perceptions that people have in relation to native and exotic species feeding on the vegetation communities.

The multiple status of kangaroos as a pest, resource and national symbol are all interwoven. The main reason a sustainable industry is viable is because of the extent to which kangaroos are regarded as a pest. If kangaroos had no commercial value then pest control would be a direct cost to graziers. However, their status as a national symbol with an attendant high conservation value has ensured sufficient public interest to ensure annual harvests are conservative (Anonymous 1998).

In contrast, the first rabbits arrived in Australia in 1859. Within 60 years the descendants of the original animals had spread at a rate of 10-15 kilometres a year and were distributed from the east coast to the west coast of the continent. The rabbit was the fastest colonising mammal in the world (Caughley 1977). Today the commercial rabbit industry harvests 2-3 million animals worth AU$5-6 million each year, and also produces 200 tonnes of dried rabbit skins worth AU$1 million (Ramsay 1994).

Off-setting this commercial value, the wild rabbit is credited with inflicting massive environmental damage to rangeland and higher-rainfall habitats, and being implicated in the decline of many native species of plants and animals (Williams et al 1995).

## Management for damage control in agricultural, forestry and conservation areas

The decision to undertake some form of management to reduce the real damage of deer is often a consideration of expense, both in labour and equipment. This is why it is so important to identify

whether the damage is sufficient to justify the costs of management. Furthermore, whether the alleged damage has actually been caused by deer and not by other wildlife species.

When the damage has been assessed and unambiguously attributed to deer, the next question is to determine if the damage may significantly affect the economic value of the crop. Even if damage is economically significant, is the cost of management greater than the cost of damage (Hall and Gill 2007)?

This does not mean that the manager should delay any action until the cost of the damage is so great that one is forced to act. Rather it means that preventative management in advance is far more effective, and that the likely need for reactive management at a later date will be reduced. For example, when deer numbers in the district are known to be high and the crop to be planted is known to be at high risk then some level of deer control should be built into the planting plan. Deer control at this early stage is likely to be more cost-effective than reacting once the damage has been, or is being, done. Curiously, people often adopt this form of proactive cropping management when it comes to weeds or insects but rarely extend it to wildlife management.

There are also some scenarios where deer control is justified, irrespective of the economic cost. For example, the protection of areas of high conservation value, the need to keep deer away from roads and avoiding vehicle collisions, or exclusions from airport precincts are all valid reasons for deer management that are not dependent on strict economic considerations.

When it has been determined that the damage caused by deer is economically significant, the management of this problem has traditionally been by a reduction in population density.

**What has the above to do with wild deer management in Tasmania?**

- There are no credible scientific publications to provide evidence-based decisions of the environmental impact of wild deer in Tasmania.
- The mere presence of a species – in this case wild deer, is not a justification for claiming negative impacts being inflicted by that species.
- Browsing and grazing by wild deer does not always equate to economic loss.

## Term of Reference:   Any Impact on Commercial Activities on Private Land

The concept of conservation through sustainable use (CSU) has attracted considerable global attention because the goal of CSU is the development of programs that simultaneously derive conservation and social outcomes. The concept was accepted in principle by the IUCN General Assembly in Perth, Western Australia in 1990. Recommendation 18.24 from that meeting recognised that 'the use of wildlife can be beneficial to conservation, especially if it provides incentives for natural habitats to be retained in the face of competing forms of land use, such as agriculture'.

In recent times concerns about wildlife conservation have become intertwined with concerns about animal rights and welfare. As a result, a good deal of confusion has resulted. Many in our community now see 'conservation' and 'use' as diametrically opposed objectives, when in reality they are part of the same continuum. So we need to define 'conservation'.

Conservation in a broad sense can be defined as:

"The sum total of actions taken to preserve and maintain items to which we attribute a positive value (Webb 1994)."

This definition is predicated by applying a positive value and the implication that without action the quality of the item will deteriorate or be lost. *Value* is a subjective term because what may be positive to one person may be negative to another. For example, kangaroos may have a high intrinsic value to urban people, but a strongly negative value to pastoralists in the sheep rangelands. *Use* is attributed positive values, regardless of the form of use. It doesn't matter if we are comfortable in the knowledge that kangaroos are still abundant, or whether the sale of kangaroo products brings in income. Both forms of use generate positive rewards, and if the reward value outweighs the negative cost, then the essentials of conservation are created – an incentive to conserve.

It is worth highlighting the opposite view that items that have no use are considered *useless*. We as a society have no history of applying resources to the conservation of items that are considered useless or valueless.

To apply these principles to wildlife, supports the contention that use-value is the essential ingredient of conservation. Uses need to generate benefits, either tangible or otherwise, that outweigh the costs or neutral values. Such a linkage supports the concept of intrinsic value, and recognises its limitations. The intrinsic value of a wild species translates to an instrumental value when any use or benefit is derived from it. Therefore there is not a single wild species that cannot be conserved on the basis of a known instrumental value, regardless of whether the motivation for conservation was based on intrinsic value.

If we keep something going, then we sustain it. Thus any sustainable use is a use that is kept going. There can be no guarantee that any particular use will be sustainable indefinitely. There can only be a probability of a use being sustainable, based on current knowledge. However, one cannot use any resource that is not conserved. Thus sustainable use is a form of conservation (Webb 1995).

**Population management**

Since many native and exotic vertebrate species in Australia are considered to be pests, the management of these species can significantly influence the success of initiatives for ecological sustainable development (ESD) and the protection of biodiversity. The best way of ensuring that vertebrate pest management is successful is for its integration into the whole management system. Therefore what are our management options?

The first point is to decide if the species in question is causing real or perceived damage. The mere presence of a species does not necessarily mean that the species is causing damage. For example, six species of deer have been present in Australia since the 1860s (Rolls 1969, Moriarty 2004). Popular dogma says that these species are exotic and, by definition, should be controlled. However, there is no published scientific evidence that any species has caused significant damage (Harrison 1998, Jesser 2005, Peel et. al. 2005). In contrast, Cause (1990) calculated that recreational deer hunting generated $77 million each year, while Finch et al. (2014) calculated that deer hunting in Tasmania alone was worth AU$18 million annually. The differentiation between the *cost* of a species and the *benefits* of that species requires careful assessment, and the answer is fundamental to commercial activities on private land.

From a historical perspective, cooperation and successful conservation are synonymous. Many of the recent landmark conservation issues have been achieved by public agencies, private organisations and key individuals working together with a common goal. Inspired legislation, species protection, habitat management and biological research have all benefited from this collaboration and cooperation.

However, the conservation community faces more complex challenges in the future than in the past. Current crises in species conservation and wildlife and habitat management are too big for agencies, organisations or individuals working alone. Economic, political, biological and social constraints are now so divergent that resource managers are overwhelmed and under-funded. Consequently, threats and conflicts affecting wildlife and wild places are accelerating at the same time that capability and opportunity to manage them appear diminished.

While human endeavour is usually rooted in self-interest, mutual interest is clearly the driving principle in conservation partnerships. As such successful partnerships hinge on the four C's – challenge, commitment, communication and cooperation.

Partnerships are a tool, and like most tools, there are times when they are effective and other times when other tools may be more useful. Effective communication is the cornerstone of any successful partnership. Goodwill and trust among partners is built through honest, clear communication on a frequent, sustained basis.

**Property-based Game Management Plans**

The guidelines above offer prospects for off-reserve conservation using the principles of Ecological Sustainable Utilisation. Such a model, initiated in the United States and successfully applied in Tasmania, has potential for wider application throughout Australia. This model is the Property-based Game Management Plan.

Since the early 1990s populations of browsing animals have increased in Tasmania to their highest recorded levels (Driessen and Hocking 1992). In many cases these animals cause significant damage to crops, pastures, forest plantations and native vegetation. Anecdotal research has shown that wallabies and Brushtail possums alone cause an estimated AU$20 million damage to agriculture and forest industries each year (Cleland et al 1995).

The challenge faced by landowners and government agencies is to develop management strategies that achieve a balance between wildlife control and wildlife conservation. In Tasmania, between 1996 and 2009, Property-based Game Management (PBGM) was demonstrated to be successful in achieving that balance (Hall 2005a).

The Tasmanian Farmers and Graziers Association, the Tasmanian Deer Advisory Committee Inc. and the (then) Department of Primary Industries and Water worked together to resolve the problems of browsing animals and developed the PBGM program which was administered through PBGM plans. PBGM plans were property-specific written agreements between landowners and hunters. The purpose of the plan was to manage wildlife, particularly game species such as wild deer, at acceptable levels compatible with agriculture, forestry and the environment while providing for sustainable hunting opportunities and fair compensation for the landowner.

The plans outlined that the hunters, in return for hunting access, would undertake various tasks which included the control of native browsing animals, property maintenance and property security to reduce trespass and illegal hunting. Hunters were also required to comply with a code of safety in the use of firearms, sign a legal waiver and indemnity and attend the property on a prescribed number of visits for hunting and property protection.

The plans did not diminish the rights of the landowner who at all times retained the authority to cancel the plan without notice or reason.

The success of this program led the-then Department of Environment and Land Management in 1996 to establish a Game Management Unit (GMU) to facilitate this program on an ongoing basis. By 2009, the staff from the GMU had facilitated these plans on over 500 Tasmanian properties, covering in excess of 1.5 million hectares of private and public land and involved over 50% of Tasmania's licensed hunters.

The GMU provided extension services and technical advice to landowners and hunters in regard to browsing animal control and nature conservation on private land. Following the recent changes to the firearms legislation many landowners and hunters recognised the need to formalise their relationship, and PBGM plans were the obvious means to achieve this arrangement and at the same time have it recognised by government.

**Relevance of PBGM plans to wild deer management in Tasmania**

In the early 1980s a wild deer management strategy was developed between property management and a group of hunters for a central Tasmanian property. This strategy sought to improve the quality and number of mature Fallow deer bucks, and involved a system of harvesting mature bucks, rigid enforcement of property rules, and patrolling the property to discourage illegal hunting

activities. The strategy was partially successful, and the number of quality bucks increased and illegal activities declined. Communication between property management and the hunters improved and a sense of pride and respect for the strategy and the property was apparent.

Unfortunately, due to a lack of knowledge of deer population dynamics and management techniques, the deer herd experienced a rapid population increase. This resulted in increased browsing and grazing of crops and pasture, to a point where the property management could no longer justify the size of the deer herd. The property then sought crop protection permits from the conservation agency responsible for wild deer management to reduce deer numbers. However, the permits were only partially effective because of delays in issuing the permits, the small number of permits issued and, most importantly, the reluctance of many hunters to cull large numbers of does which were considered to be the breeding stock.

The situation of excessive deer numbers continued until drastic control measures were necessary. During this time a high level of animosity developed between the property management and the deer hunters. This conflict resulted in the formerly positive management strategy for deer management to disintegrate and become ineffective.

In 1992 several hunters tried to resurrect the deer management strategy. The primary aim of this group was to resume dialogue with the property's landowner and investigate mechanisms to remedy the situation of too many deer. This initiative failed.

In 1993 a wildlife biologist was employed in Tasmania to investigate solutions to problems faced by landowners, hunters and wild deer in Tasmania. This person, combined with an enthusiastic core group of hunters and the landowner provided the opportunity to introduce a Property-based Game Management Plan. In 2009 this Plan was still in operation and served as a blueprint for over 500 other properties in Tasmania.

The advantages of the plan to the landowner included:

- Retention of property control and a knowledge of who was present on the property at all times,

- Ability to maintain a viable farming and grazing operation by harvesting adequate numbers of wildlife ( including deer),

- Ability to ensure the safety of hunters whilst they are on the property,

- Maintenance of a working relationship with the property hunters and thereby implementing a successful Property-based Game Management Plan, and

- Ability to reduce deer poaching and illegal trespass through the active involvement of the hunters, and wildlife rangers.

In return the hunters were able to:

- Maintain open communication with the landowner and have hunting access to the property,

- Conduct organised culling programs for native and exotic species as required by the landowner,

- Actively participate in a successful Property-based Game Management Plan by collecting data upon which informed wildlife management decisions were based,

- Improve the quality of the deer herd by restricting the harvest of young bucks whilst removing excess female deer,

- Have the opportunity to voice their opinions on issues relating to wildlife management on the property,

- Ensure that sustainable wildlife populations are maintained for the future, and

- Provide hunter education and training opportunities for new or young hunters.

By having a dedicated group of hunters on the property, the landowner was in a better position to monitor the deer populations on the property. The hunters recorded how long they spend hunting (hunter effort) and counted the numbers of animals both seen and taken on the property. This information was summarised periodically throughout the year, or was recorded in a property log at a designated location that the landowner or game manager could access at any time.

Based on this accurate information, both the landowner and the hunters were able to make informed decisions about deer management - decisions such as whether the harvest of deer was sufficient, or too high or too low.

Data collection allowed for informed deer management decisions based on sound, property- specific information. Historical data became available to help identify trends and for comparative purposes, and all key stakeholders were in a better position to evaluate and monitor the effectiveness of deer management decisions against property goals and objectives.

Both the landowner and the property hunters derived positive outcomes from the program. The landowner was getting many hours of hunting effort from property hunters who were putting in increasing efforts. The landowner was also observing an increase in the numbers of does harvested on the property. Hunters, on the other hand, increased the amount of venison available for their freezers and were seeing more, and better quality, male deer each year. A win-win for both sides.

As a result of gathering such data, the property hunters were able to quantify their effort and value to the landowner and the deer herd. The landowner was able to determine the economic value from property hunters and the opportunity cost for actively managing the wild deer on their properties.

The success of the above programs was evidenced in the mid-2000s by a House of Representatives Enquiry into Pest Animal Management recommending that PBGM should be the program of choice for pest management in Australia. The Tasmanian program was further endorsed by a Victorian government enquiry into pest management in that state, and some of the leading deer biologists in the USA concluded that 'Tasmania led the world in wild deer management outside of the USA'.

Contrast the deer management program between 1996 and 2009 with today, because none of those programs now exist. In 2009 several middle-ranked bureaucrats within the Tasmanian Department

of Primary Industries and Water, without any consultation or reason, abolished the deer management program. I suggest that it is no coincidence that today Tasmanian landowners are paying the price for such incompetent decision-making with abundant wild deer herds and disgruntled hunters.

Today's so-called deer management program in Tasmania is no more than an exercise in issuing Crop Protection Permits to landowners in the vain hope that such an administrative process will somehow manage the deer population. There is little or no monitoring of the abundance and distribution of wild deer on private properties; there is no data collection on the deer harvest to adaptively determine harvest levels; there is little interest by hunters to cull over-abundant native wildlife in return for property access; and there is a loss of income for landowners who previously derived access fees from hunters. In stark contrast to the former win-win situation in Tasmania, the current situation is clearly a lose-lose situation.

## Term of Reference:     The partly protected status of fallow deer under the Wildlife (General) Regulations 2010

In all states of Australia the killing of deer is determined by statutory provisions that impose restrictions of firearms and ammunition, time of day and season, and numbers that may be taken. These provisions vary from state to state and species to species, which leads to confusion and conflict.

All of these pieces of legislation have penalties for the illegal spread and dispersal of wild deer into new areas, but populations of most deer species continue to increase in number and distribution throughout Australia (Moriarty 2004). Current management strategies are clearly not controlling numbers or limiting damage beyond providing temporary relief of the problem in local areas where culling effort is high. The same comments relate to the deer populations in the UK (Tapper 1999).

The factors that work against any long-term effectiveness can be broadly lumped into logistical issues; problems due to lack of knowledge or planning of a management program; biological issues relating to reducing and then holding a reduced population size; and importantly the weak relationship between deer density and damage levels. No amount of legislation or changing the legislative status of wild deer is relevant to these issues.

### Logistical issues

Some deer management organisations in the UK – such as the British Deer Society and the British Association of Shooting and Conservation, argue that the poor success of stopping the expansion of deer populations is linked to the inability of simply killing sufficient numbers under the current legislation. Furthermore, the lack of coordination of management effort over large areas reduces the individual's chances of achieving a measurable decrease in numbers.

These observations have some resonance when translating them to Australia. In states like Tasmania where wild deer are Partly Protected Fauna under the Wildlife Regulations 2010 and large numbers of properties previously managed wild deer through well-established Property-based Game Management Plans, deer populations were not expanding without human intervention and numbers were relatively stable. In contrast, in Queensland where deer were classed as Feral under the

*Nature Conservation Act* 1992 in 2005, populations are expanding and numbers in some herds continue to increase.

If culling effort and the management objectives for any population differ within the species range then effective management and control will be difficult. Therefore for effective management, the objectives of that management must be consistent over the entire population range with most or all of the deer managers acting in concert – and these management objectives have nothing to do with legislative status of the deer.

### Planning management programs

The lack of clear management objectives will scuttle any management program, irrespective of how keen the participants are. Effective and clear management objectives are essential in directing any management effort. However the objectives will, and must, vary depending on the circumstances. A property that seeks to maintain high deer numbers for public viewing will have very different objectives to a conservation property seeking to protect threatened vegetation communities.

### Biological issues

Putting aside the logistical issues, there are some important biological issues as to why it is difficult to achieve, and then maintain, reductions in deer density.

The response of most wild animal populations to a reduction in density is to increase recruitment – a reduced density means there are more resources for each survivor, which leads to higher weights, fitter animals breeding more often, higher or sustained juvenile survival, and increased immigration from neighbouring properties. Keeping populations at a reduced density thus means maintaining, or even increasing, culling effort. If management effort is reduced it may heighten the original problem and the deer population will 'bounce' to levels higher than originally seen.

For these reasons, and based on interstate and international experience, the legislative status of deer either as a game animal, partly-protected, or pest is irrelevant to the management of the species. Perversely evidence suggests that having deer as Partly-protected in Tasmania presents greater management opportunities than being declared pests such as in Queensland or Western Australia.

## Term of Reference:     Commercial opportunities for the use of wild population stocks

Deer farming in Australia is controversial. For some people it is a lucrative alternative farming enterprise. Others suggest that it is wrong to farm a feral, non-domesticated species that has the potential to escape and possibly cause environmental damage. The future of deer farming in Australia is difficult to predict. The first issue is the economics of deer farming. Farmed deer have been classified as livestock in several states, but the economics of buying, selling, husbanding and marketing of deer makes the industry problematic. Agricultural history is replete with boom and bust industries where the value of the animals soared to very high levels early in the boom phase, only to fall very quickly as stock became more available.

The economic value of deer is measured in the marketability of deer products. In reality, this market is a niche market only supported by the uniqueness of the products. In terms of the management of wild deer it is difficult to see how deer farms will assist in this endeavour.

**Deer hunting**

Society has become increasingly urbanised over the past 50 years and support for legal hunting has proportionally declined during that time. Public attitudes towards hunting are more complex when factors such as wildlife recreation and wildlife management are involved. While hunting for food is supported, many people do not support trophy hunting, and there is almost universal rejection of illegal hunting (Murphy 1998, Hall and Gill 2005, 2007).

Therefore it is critical that deer management programs clearly identify the role of hunting in the broader scheme of wildlife, and land, management activities. Hunting programs must be designed to ensure that game animal populations are in balance with their environment, harvest is as humane as possible, harvested animals are used for food and hunters use safe and ethical practises.

If the future of hunting is to be assured in Australia, hunters must be continuous and effective spokespersons for the conservation and management of all wildlife species, be they hunted or not. For better or worse, the future of hunting rests in the hands of the majority of Australians who either do not, or never will, hunt. Hunting will continue to be an acceptable activity only if the broader community sees hunters as custodians and stewards of wildlife resources (Hall 1999). This places a responsibility on all hunters to conduct themselves in a way that portrays hunters in a professional, responsible manner.

The 21st century will see continued and more frequent attacks on hunting. Almost inevitably these attacks will be linked with the political debate about ownership and use of firearms. Hunting on private lands will also be more closely examined. Landowners who work within state wildlife agency programs for deer management will receive public goodwill and provide the opportunity to some hunters for uncrowded hunting access. However, properties that offer only trophy deer in exchange for a significant fee tend to reflect poorly on all hunting and all hunters. State agencies may have little control over such practises where the harvested animals are classified as livestock, but the distinction will matter little to those opposed to hunting.

All of these sub-issues will be intertwined to the broader issue of holistic management of the ecosystem. Opponents to hunting will attempt to characterise all hunting as a crude form of resource exploitation, and hope that this tactic resonates with those people with little knowledge on the subject.

As the future of deer hunting is debated we must remember that in a democracy like Australia decisions are made by the majority of the minority who are most vocal about a particular issue. Therefore the debate between those who espouse conservation and management versus those who support preservation will continue. A lurch towards preservation will occur whilst increasing numbers of Australians live in urban environments, and only connect with wildlife through the media. For the media, hunting is a poor sport.

**Conclusion**

Some people may see the future of deer management as daunting and be tempted to give up. Others see the future as a challenge and an opportunity to expand our wildlife heritage. Wild deer are now an integral part of the Australian biodiversity, and no amount of moral or philosophical posturing will remove that fact.

If Australia, and more importantly Australians, is to have a mature approach to our wildlife management we must move away from the traditional approach of 'love the natives and kill the ferals' and embrace wildlife management for all its complexities, challenges and positive outcomes (Hall 2005b).

# Term of Reference: Any matters coincidental thereto

What is the future of wild deer and their management in Tasmania? To answer this question it is necessary to understand how we have come to our present status relating to deer management. That understanding is, in turn, critical in deciding what the future may hold. It is people who perceive some interactions with wildlife as positive or negative, and it is our human value system that defines some animals as pests or resources. How good we are at solving wildlife issues depends on our skills in managing people, rather than managing animals.

The 20th century will be referred to as the century which began with extreme and damaging land use and wildlife exploitation and closed with the formulation of a new land management policy – conservation. During the 20th century it was recognised that neither unsustainable exploitation or absolute preservation, provided the means of protecting natural resources. Conservation through wise use was adopted as the international catch-cry. The principle behind the paradigm is a centralised decision-making system undertaken by experts using the best scientific information available.

As far as deer management in Australia is concerned, this principle has, on the whole, paid unremarkable dividends. Many keen students of the subject suggest that a new era is dawning, one in which management will be determined at more local levels by groups of various interest groups and less authoritarian control by government experts (Wondollech and Yaffe 2000, Hall and Gill 2005, 2007).

The first years of the 21st century are featuring a still-evolving land management paradigm – sustainable ecosystem management (Boyce 1998). This new concept has its roots in federal commitments to Ecological Sustainable Development (ESD), but not much thought has been given to the mechanisms of renewal and sustainability. Rather, greater emphasis has been given to protecting specific sites and endangered species and is still generally preservationist in its approach.

The up-side of sustainable ecosystem management for the management of wild deer is that science is increasingly used to inform decision makers, and to identify and contrast potential outcomes. Decisions are considered adaptive – that is, decisions are routinely revisited and revamped as information accumulates about the results of management. Termed adaptive management, this supposedly new technique requires gathering data about both the affected environment and about

people's concerns and desires and making 'consensus' decisions based on experience and new information.

For wild deer management in Australia, adaptive management offers a major step forward. Through this process those people who only see wild deer as a destructive feral pest have an obligation to scientifically prove their case. Similarly those people who view wild deer as a valuable exotic resource must gather the data to prove their point (Hall 2005b). It is then the responsibility of the government agency to objectively weigh both data sets and formulate a management regime that is fair to both groups of people. Anything less will just see a continuation of the 'us-and-them' approach that has blighted wildlife management in Australia for the past century.

The concept of integrated damage management is widely known and accepted for weeds or insects, as is the application of various tools and methods to mitigate damage. However the concept needs to be expanded for wildlife beyond the methodology phase to include cooperation, coordination and support from all the groups with an interest in sustainable wildlife management. Such an approach would represent an appropriate and responsible response to a matter of great public importance.

Consequently the ideas should be tested experimentally. Such experiments are usually so large that they should employ the approach of integrated management, where management itself is the experimental manipulation. For example, animal densities could be managed so that they vary from no removal to severe removal over short and long time periods. Without such an integrated management approach, the issue of overabundance cannot be resolved, and the problems and perceptions will remain the subject of debate.

**The role of state agencies in wild deer management**

Whatever the future holds for the organisation and mission of state wildlife agencies, it seems clear that wild deer management, where it exists, will continue to be a program of state wildlife agencies. Hunters have demonstrated their willingness and ability to support wildlife management programs that include opportunities to harvest wild animals within sound biological guidelines (Hall 2003, 2004, Hall et al., 2012, Hall et al., in press). Thus, deer management likely will remain important to wildlife management activities in these states.

State wildlife agencies that are less influenced by any positive outcomes for deer management may still use hunters to control undesirable deer populations. Harvest of deer by hunters seems unlikely to change dramatically as a component of deer management programs during the next several decades. Most state agencies charged with huntable deer populations are primarily concerned with the following five deer management issues:

- Expansion in deer numbers and populations,
- Deer-vehicle collisions and the potential for human injury,
- Deer in urban areas,
- Depredation on native vegetation, and
- Damage mitigation to agricultural and forestry operations.

These issues are summarised by the increasingly habituation of deer living in proximity to humans, and habituation to humans occurs when the animals learn that human behaviour is both non-

threatening and predictable. Such reactions are now being seen in some water catchment areas in Victoria, urban areas of New South Wales and Queensland and agricultural areas in South Australia and Tasmania. Whilst this habituation may provide some advantages to the deer, allowing them to exploit nutritious vegetation, there is also an increased risk of deer-caused injury to humans, damage to private lands and extra concerns for wildlife management agencies.

It is because of such problems, and the fact that wildlife agencies have a mandate to solve problems with human-wildlife interactions, that agencies attempt to reduce or eradicate deer in areas that would facilitate habituation. Such reduction programs place agencies in awkward situations because they have to meet the conflicting needs of hunters, landowners and those people concerned about animal welfare and rights.

Ultimately it will take persistence and determination to achieve this goal. However, if wildlife management on private land is to be genuinely sustainable, it must have public understanding and acceptance. The public will not change and be supportive until there is broad and overt support from the wildlife agencies.

In the specific case of Tasmania the state agency responsible for wild deer management must be staffed by competent people with a commitment to adaptive management of the deer resource. Given the incompetence shown by DPIPWE in the dismantling of the wild deer program in 2009, it is difficult to see how the current employees are suitable for this management task.

**The role of hunting organisations and landowners**

The role of non-government organisations (NGOs) in deer management may expand in the future. Many hunters are members of these organisations, and the investment of their time and money suggests there is a role for NGOs in the future of deer management.

An increasing presence of deer on private property, with potential for damage to agricultural crops and forestry operations, may produce conflict. That conflict will require more attention by hunters to deer depredation or landowners may resort to commercialised hunting opportunities to reduce losses and enhance their economic returns. The positive relationship developed between hunters and landowners through the Property-based Game Management program bodes well in reducing potential conflict in relation to deer management.

**Conclusions**

If one accepts the premise that state government agencies working in collaboration with other stakeholders have a mandate to solve problems with deer-human interactions, then it is incumbent on those employees to employ competent and professional staff. Sadly, currently in Tasmania there is a dearth of competent or professional game management staff *per se*, and particularly in the sphere of wild deer management.

Such a disappointing position was not always the case. Between 1996 and 2009 there was a professional group within the state agency with responsibility for game management and particularly wild deer management which monitored populations, collected statistics on the deer harvest and liaised between landowners and hunters. However, such a positive situation which was

acknowledged by governmental reviews and international experts as leading Australia, was terminated on a whim by middle-ranking bureaucrats.

If Tasmania has any hope of regaining its rightful position as a responsible game management, and particularly wild deer management state, then its first priority must be to employ and support competent and professional staff who are well trained and motivated in wild deer management.

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