



13 January 2014

Web: www.invasives.org.au/home.html

Tabled 20/8/14
Session 4.
TP #2

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Is recreational hunting effective for feral animal control?

Feral animals cause severe damage to Australian wildlife and ecosystems. The Invasive Species Council strongly advocates eradication and control of feral animal populations to protect environmental values. But is recreational hunting an effective way of achieving this?

By Dr Carol Booth

Recreational hunters are gaining increased access to Australian public lands, including national parks, to hunt feral animals. In NSW hunting is now allowed in more than 2 million hectares of state forests, and in Victoria the government has agreed to allow hunting in the newly created Red Gum national parks. Hunting groups and shooting political parties would like to see it become much more widespread. In part this is because private landholders have been reducing access to hunters because of bad experiences and liability concerns.

These deals for hunters are being presented in the guise of environmental programs, as effective ways to control feral animals. The NSW Game Council claims that the 15,000 or so feral animals killed in the two years of 'conservation hunting' in NSW state forests have environmental benefits, with 40,000 more native birds in forests because of the 1500 foxes killed (26 for each fox).¹

But allowing hunting in reserves represents a change in protected area ethos that should be carefully considered and publicly debated, rather than implemented as a political deal with shooters parties and hunting lobby groups. If recreational hunting is supported under environmental programs there should be good conservation reasons to justify it.

On the surface it seems like a good idea: recreational hunters kill animals, which means fewer pests, which means less damage to the environment. They kill for free, so why not let them perform this service for the environment?

But there are flaws in the 'dead pest is a good pest' thinking that underpins the claims of environmental benefit, and there are risks with recreational hunting in conservation areas that may outweigh any advantages.

Here we outline four fallacies and three risks associated with recreational hunting of feral animals that should be part of the public debate.

The fallacies are:

1. Killing feral animals equates to 'controlling' feral animals;
2. The effectiveness of recreational hunting is on a par with professional control programs;
3. Recreational hunting effectively supplements professional programs (a partial fallacy);
4. Recreational hunting is cost-free, so we may as well take advantage of it.

The risks are:

1. Recreational hunting will result in new and expanded feral animal problems;
2. Hunting will undermine culling for environmental reasons;
3. Hunting will cause collateral damage.

The NSW Game Council claims it is playing a "positive role" in feral animal control: in just over a year of hunting in state forests hunters killed more than 11,000 feral animals, "including 4952 rabbits, 2059 goats, 1761 feral pigs, and 1015 foxes."²

The thinking behind their claims seems like common-sense: that they are effective simply because they remove animals from a population. Surely that means that there are fewer feral animals to eat native wildlife and cause environmental damage?

But most feral animals are highly mobile and highly fecund, and quickly replace those killed. The animals shot by recreational hunters are soon replaced by young animals that otherwise would not have survived because they would not have found vacant territories to occupy.

Footnotes:

¹ Game Council New South Wales (2008) makes the claim that one fox killed represents 26 birds saved. At the time of their media release, about 1000 foxes had been killed and they said this meant 26,000 birds had been saved. Cubby (2008) reports that about 15,000 feral animals, including 1507 foxes, have been killed by hunters over two years of the NSW 'conservation hunting' program to October 2008, which on the same logic implies 40,000 birds saved.

² Game Council New South Wales (2008).

The Invasive Species Council campaigns to protect Australia's environment from invasive species. To find out more about the council visit our website at www.invasives.org.au, or email us: isc@invasives.org.au.

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For many invasive species, more than 50 per cent of the population must be culled each year just to maintain the status quo; for foxes in Victoria the estimate is more than 65 per cent.³

In recent years best practice for feral animal control has moved beyond a simple 'kill as many as possible' approach due to its repeated failures.⁴ A large cull may not reduce populations or have environmental benefits, and may even result in perverse outcomes of expanded distributions and increased densities of targeted and non-targeted feral animals⁵ (see Risk 1). The focus of monitoring is now on environmental benefits achieved, not on numbers of pests killed. As the Invasive Animals CRC says, goals "should be set in terms of biodiversity benefits, not numbers of pests killed".⁶

Telling evidence against the effectiveness of recreational hunting is the almost universal failure of bounty schemes, in Australia and overseas. Bounties provide an economic incentive for hunters to target designated invasive animals, and to increase hunting pressure on the target species well above that motivated by recreational pleasures alone, but biological reviews find they fail.⁷

1. Bounty schemes fail

Bounties "are an example of powerful self-interest defeating reason"

– Tim Bloomfield, a fox expert reviewing bounties⁸

It is now well recognised by pest experts that virtually all bounties fail to reduce feral animal numbers or the damage they cause.⁹ They have often proved counterproductive, by creating incentives for spreading or maintaining the population of the targeted animal, for example.¹⁰ Bounties typically reduce pest numbers by 2-10 per cent,¹¹ which is considerably less than the replacement capacity of most feral animal populations. Feral pigs can produce two litters a year, each consisting of up to 10 piglets.¹²

Victoria had a fox bounty in 2002-03 that resulted in close to 200,000 dead foxes, but was abandoned because it didn't work. A review of the scheme found that it reduced fox abundance in less than 4 per cent of the

state, and that numbers would quickly bounce back or go even higher as a consequence of hunting.¹³ There was anecdotal evidence that the scheme was abused (with foxes from interstate presented for payment) and that shooters deliberately left residual populations to secure future income. A pig bounty run by Queensland Sugar Research Stations also failed, probably eliminating less than 5 per cent of the local population and with over half the payments thought to have gone for pigs outside the bounty area.¹⁴

The fact that bounty schemes almost always fail is strong evidence that recreational hunting has little to contribute to feral animal control, because the hunting pressure without financial reward is likely to be considerably less than when incentives are offered. The arguments regularly advanced in favour of recreational hunting for control of feral animals are similar to those advanced for bounty schemes, relying on the fallacious equation that any killing of feral animals equals population control.

2. Hunting habits and preferences are contrary to effective control

Hunter preferences for particular types of prey and particular hunting conditions often limit their contribution to feral animal control. They prefer shooting the males of some species, and they typically hunt close to roads and in easy terrain.

With feral deer, for example, recreational hunters prefer to shoot bucks (males) for the trophy antlers and so as not to reduce the reproductive capacity of deer.¹⁵ A similar bias is likely to exist for pigs and goats.¹⁶ But females are the reproductive sex and the important one to remove in polygamous species such as deer and pigs. The removal of males has no impact on the birth rate.

Recreational hunters most target easily accessible locations, which limits their contribution to control in environmentally valuable areas away from roads. In a recreational hunting area in New Zealand deer densities were three to four times higher in areas more than 3 km from access points than in areas next to access points.¹⁷ Feral animals may learn to avoid areas where hunting is regularly conducted, as was documented in Europe for

Footnotes:

³ Fairbridge & Marks (2005). They note that a 2001 ban on fox hunting in Britain (to help prevent foot and mouth disease) had no impact on fox abundance, suggesting that hunting was not normally affecting population numbers.

⁴ Norris et al. (2005).

⁵ Fairbridge & Marks (2005); Norris et al. (2005).

⁶ Norris et al. (2005).

⁷ Hassall and Associates (1998); Bloomfield (2005). Bloomfield notes that the bounty for thylacines in Tasmania was probably successful, but the species was already in decline.

⁸ Bloomfield (2005).

⁹ Hassall and Associates (1998); Bloomfield (2005); Wilson (2008).

¹⁰ Hassall and Associates (1998).

¹¹ Bloomfield (2005).

¹² Invasive Animals CRC (2008).

¹³ Fairbridge & Marks (2005).

¹⁴ Hassall and Associates (1998).

¹⁵ Fraser (2000) notes that New Zealand hunters "pass up opportunities to shoot fawns and / or hinds in favour of stags ... presumably in an effort to conserve the deer population." Victorian Department of Sustainability and Environment (2008a) notes the "inherent desire for hunters to harvest stags" and Tasmanian Department of Primary Industries and Water (2008) comments that "there is still resistance by some hunters to harvest does." However, Fraser says the pattern is changing in New Zealand and some hunters are now more motivated by the "opportunity to take home some venison and enjoyment of the outdoor experience".

¹⁶ A letter from Graham Smith published in the June 2008 edition of 'Australian Shooter': "I am an enthusiastic pig hunter, but am always amazed by the number of people who are simply after that one trophy boar. Can you please remind readers of their ecological responsibility when it comes to pig hunting?"

¹⁷ Fraser (2000), citing Nugent (1988).

deer around hunting trails,¹⁸ and be pushed into more sensitive locations (see Risk 1).

Except for hunters specifically motivated for conservation reasons, hunters are likely to be motivated to maintain or spread prey for hunting ease or success (see Risk 1).

3. Widely varying skills limit effectiveness

*Recreational shooting "has never been seen as an adequate control tool in (Australia and New Zealand) for most vertebrate pest species."*¹⁹

Recreational hunters have widely varying abilities and a small number of skilled hunters achieve the vast majority of kills. In New Zealand just 5 per cent of hunters account for more than half the deer killed for sport.²⁰ According to the Australian Deer Association, the average deer hunter in Australia succeeds on only about one of six hunts,²¹ consistent with the 85 per cent failure rate recorded for New Zealand hunters.²² In 2007, no deer were shot under 180 deer shooting permits issued in three conservation areas in Tasmania, and in Victoria licences to shoot about 1500 hog deer were issued, but only 175 were shot.²³

The relative ineffectiveness of recreational hunting has been demonstrated where commercial hunting or professional culling result in much larger rates of removal, as discussed in the next section. In South Australia, for example, one helicopter shooter shot more than four times as many deer in four hours as 65 recreational hunters did in four days.²⁴ Often, on-ground shooting is not an effective or the most effective method of control (aerial shooting, trapping or baiting may be much more effective). At best, recreational hunting may sometimes help supplement other control methods.

The Australian Deer Association claims that hunting is "the most effective" method of controlling feral deer populations according to pre-determined requirements.²⁵ But wherever comparison has been possible (and published studies are very sparse), recreational hunting has proven much less effective than profes-

sional culling or commercial hunting. The most effective methods of feral animal control are often not on-ground shooting.

1. Professional programs are much more effective than recreational hunting

The comparative ineffectiveness of recreational hunting for population control is demonstrated in the contrasting results of two efforts to reduce deer numbers at the 9000 ha Gum Lagoon Conservation Park in South Australia. A 2002 trial using 65 recreational hunters in a directed hunt over four days resulted in 44 deer (18 female) shot.²⁶ The numbers shot were estimated to have been about the annual population increase for fallow deer and one-third of the annual increase for Red Deer. In contrast, a four-hour helicopter cull in the same area in 2007 using one shooter resulted in 182 deer shot, estimated to be more than 90 per cent of the population.²⁷

In a pig control program to protect wetlands in Florida, where sites open to recreational hunting were compared over three years with sites subject to professional culling, recreational shooters in three years removed less than 13 per cent of the pigs removed by targeted culling in two years.²⁸ The difference was attributed to the contrasting objectives of managing a habitat for conservation and managing pigs as a 'game' animal.

In Tasmania, recreational hunters were judged to be relatively ineffective compared to commercial and contract hunters for killing pademelons and wallabies to protect plantation trees, crops and pastures, particularly in remote or broken country.²⁹ The reviewers pointed out that "recreational hunters are often driven by the need to achieve long-term access to hunting rights rather than a desire to reduce browsing mammals to low levels."

In New Zealand, most deer populations have been reduced to 75-95 per cent of the peak numbers seen in the mid 1900s, mostly due to commercial helicopter hunting.³⁰ Highest densities occur in tall forests, where deer are protected from aerial hunters and subject only to recreational control.

An assessment of the relative cost-effectiveness of recreational hunting, commercial hunting and state-funded culling in New Zealand for controlling deer populations found that increasing recreational hunting pressure was likely to be effective only where "the desired reduction in deer density is relatively small."³¹ Where major

¹⁸ Orueta (personal communication).

¹⁹ Coleman et al. (2006).

²⁰ Orueta & Aranda (1998), citing Nugent (1988).

²¹ Australian Deer Association (2006).

²² Orueta & Aranda (1998), citing Nugent (1988).

²³ Tasmanian Department of Primary Industries and Water (2008); Victorian Department of Sustainability and Environment (2008b).

²⁴ Peacock (personal communication).

²⁵ Australian Deer Association (2006).

²⁶ Anonymous (2004); Peacock (personal communication). Hunters were restricted to shooting standing or walking deer for welfare reasons, and

used stalking and spotlighting.

²⁷ Peacock (personal communication).

²⁸ Engeman et al. (2007).

²⁹ Coleman et al. (2006). This should not be taken as endorsement of that program.

³⁰ Nugent et al. (2001).

³¹ Nugent & Choquenot (2004). Fraser (2000) had similarly concluded that recreational hunting was best suited for small areas with good access and close to population centres with few other hunting opportunities, where only modest reductions in deer density were required.

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reductions are required in extensive forest areas, paid ground-based deer cullers are likely to be most effective, and more modest reductions may be best achieved by supporting commercial helicopter operations.

2. On-ground shooting is often not the best control method

Professional cullers are also likely to be more effective than recreational hunters because they can employ more effective methods, such as aerial shooting, trapping, using 'Judas' animals and shooting at night. The assessment of effectiveness should also include welfare criteria.

With deer for example, most professional on-ground control in Australia is done at night, using spotlights, focused on areas where large numbers of deer congregate and where the impact is greatest.³² Recreational deer hunters in Victoria are not permitted to hunt at night. Effective control of deer in Australia and New Zealand has been achieved using aerial shooters.³³ The use of Judas deer (deer fitted with radio collars) has been used successfully in New Zealand and may be investigated in South Australia.³⁴

The effectiveness of methods to control feral animal populations should be assessed in terms of specific environmental or economic goals. A New Zealand study compared the effectiveness of exclusion fencing, aerial hunting and recreational hunting on the recovery of mountain beech plots in New Zealand.³⁵ By extrapolation using a simulation model, it was concluded that when plots were fenced they would obtain an adequate number of stems mostly within 20 years, and for all plots within 40 years. With aerial hunting most plots would need 20-40 years to obtain sufficient stems. But with recreational hunting only, it would take longer than 40 years for all plots, and some plots would take longer than 80 years. Recreational hunting would result in a loss of forest canopy, altered ecosystem processes and weed invasion.

The same limitations of on-ground shooting compared to other methods extend to other feral species. According to the Invasive Animals CRC, the most effective management techniques for pigs are aerial shooting and aerial baiting in remote areas and trapping in more urban areas.³⁶ Ground shooting, with or without dogs, "is generally considered to play an insignificant role in damage control except where it is intensively conducted

on small accessible populations".³⁷

In a comparison of the effectiveness of different methods of feral goat control, ground shooting was rated as low for efficacy, control method efficiency, logistical practicalities and overall effectiveness (it was only rated high for 'target specificity').³⁸ Aerial shooting was rated as high on all criteria. The use of Judas goats, trapping, mustering and fencing all rated more highly than ground shooting. According to the Invasive Animals CRC, fox hunting results in "minimal reductions".³⁹ Aerial shooting is currently the only effective means of controlling feral animals on large conservation areas, particularly in remote areas.⁴⁰

The limited effectiveness of recreational hunting limits its value even as a supplement to professional programs, particularly in conservation areas where the risks (see below) are likely to outweigh the advantages.

In some specific instances, however, recreational hunters have contributed to control efforts. And there are undoubtedly some highly skilled hunters committed to conservation and animal welfare who could contribute to control programs. The difficulty is to limit hunting for environmental programs to that sub-set of hunters and to ensure that supplemental hunting is undertaken only if effective and part of a well-managed and monitored control program.

The efficacy of recreational hunting as an adjunct to more targeted control programs has not been assessed in Australia.⁴¹ There are isolated examples, and they seem to have in common that a small team of skilled hunters is used to supplement other more effective methods.

There has been success with volunteer shooters in the South Australian Bounceback 2000 program.⁴² In arid land reserves the combination of controlled sequential hunts using recreational hunters who have a commitment to conservation, with helicopter culls and opportunistic shooting by park rangers, has been successful.⁴³ There has been a strong focus on quality control by ensuring that hunters meet shooting standards and obey the rules

Footnotes:

³² Sharp & Saunders (2004); NSW Department of Environment and Conservation (2005).

³³ Fraser (2000); Norris et al. (2005); West & Saunders (2007); Peacock (personal communication). An assessment of South Australian aerial control of camels reportedly found a high standard of animal welfare outcomes. ISC is seeking further information about welfare standards.

³⁴ Masters (2006).

³⁵ Duncan et al. (2006).

³⁶ Norris et al. (2005).

³⁷ Invasive Animals CRC (nd).

³⁸ Norris et al. (2005).

³⁹ Norris et al. (2005).

⁴⁰ Norris et al. (2005).

⁴¹ Coleman et al. (2006).

⁴² Norris et al. (2005).

⁴³ Peacock (personal communication).

and directions of departmental staff.⁴⁴

Although hunting has failed to control overabundant deer in most of the US,⁴⁵ there are a few examples of effective reduction of deer densities in particular localities.⁴⁶ This is consistent with the conclusions in New Zealand that recreational hunting may contribute where only modest reductions in deer density are required.⁴⁷

ISC invites information about other successful control programs using recreational hunting.

The few documented positive examples of hunting suggest that recreational hunters should only be used when they meet high standards, are tightly controlled and contribute to a broader program of feral animal control with well-defined goals. Importantly, hunting should only be conducted where the likely benefits outweigh the risks identified below.

There is a strong emphasis on the fact that recreational hunters offer their services for free, implying that even if they are not highly effective there is nothing to lose and likely something to gain for nothing. But this fails to take into account the costs associated with recreational hunting, particularly in conservation areas.

The potential costs include:

Management costs: Licensing, regulating and managing recreational hunters to ensure they contribute to control programs and do not compromise conservation, human safety and animal welfare conditions.

Political costs: Where governments use recreational hunting as an excuse not to fund professional control programs. Where hunting interest groups gain greater political power as a consequence and are accorded political priority that compromises environmental goals.

Environmental costs: When recreational hunters seek to maintain or increase hunting opportunities by shifting feral animals to new hunting locations and leaving young and females to breed up again. When hunting pressure in accessible areas pushes feral animals into more remote areas, increasing the pressure on environmentally valuable areas. When there are perverse outcomes, such as increased reproduction rates, resulting from hunting. When hunters damage environmental values, by losing hunting dogs for example.

Safety and welfare costs: When human safety and animal welfare are compromised by less-skilled or irresponsible recreational hunters.

These potential costs are discussed below as risks. They demonstrate that recreational hunting is not cost-free and costs are likely to outweigh benefits in many circumstances.

There is a risk that recreational hunting will worsen feral animal problems, either because of the response of feral animals to hunting pressure or because of the behaviour of some hunters motivated to increase or sustain populations of animals for hunting.

1. Hunting may increase population densities or push feral animals into new or environmentally sensitive areas

Recreational hunting may sometimes perversely result in a higher density of feral animals due to higher rates of breeding or changes in social structure. As discussed by the scientists who reviewed the Victorian fox bounty, foxes (and other rapidly breeding species such as pigs) produce "a doomed surplus" of young, with the majority dying before they are one-year-old.⁴⁸ When adults are killed by hunters, and there is less competition for resources, more young will survive to replace them. In addition, foxes may respond to moderate reductions in abundance by increasing the number of females that become pregnant, thus increasing the numbers of foxes produced.⁴⁹ As noted in a report by the Invasive Animals CRC, another perverse outcome may occur when experienced foxes are killed: "younger foxes moving in may establish smaller territories, leading to a higher fox density."⁵⁰

Because recreational hunting tends to be localised and concentrated near roads, it may cause feral animals to disperse into more remote areas away from hunting, including into more environmentally sensitive or pristine areas, and it may in this way increase their range and damage. Information on this potential impact is sparse. A European study found that deer avoided trails from where hunting was conducted.⁵¹ Under hunting pressure introduced ungulates may disperse into wider areas faster than they otherwise would.⁵² In one study of feral

⁴⁴ A history of the program can be found at <http://www.hunt-cons.asn.au/html/history.html>. It involves the Hunting & Conservation branch of the Sporting Shooters Association in South Australia, which formed specifically to achieve conservation control of feral animals. The website says they "have committed to providing our resources to help interested farmers, or organisations in achieving conservation related outcomes..." and activities include "organised culls, collection of research specimens, wildlife surveys, warren destruction, re-vegetation projects, or restoration of historic sites."

⁴⁵ Cote et al. (2004)

⁴⁶ de la Cretaz & Keltz (2002); River Bend Nature Centre (2008).

⁴⁷ Fraser (2000).

⁴⁸ Fairbridge & Marks (2005).

⁴⁹ Fairbridge & Marks (2005).

⁵⁰ Norris et al. (2005), citing Benshemesh (personal communication).

⁵¹ Orueta (personal communication), citing Aranda et al. (1996).

⁵² Orueta & Aranda (1998), citing Uphan (1980).

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Controlling feral animal populations for conservation purposes is very difficult, because feral animals are highly mobile and highly fecund, and able in most cases to quickly replace those killed. A recent Federal Government report by the Invasive Animals Control CRC on the management of feral animals (in the rangelands) provides the following guidance.⁷³

Programs need to "be carefully planned and co-ordinated", based on an understanding of the impacts of the target feral animals, with clear, realistic goals and assessment of all possible solutions and with monitoring. The goals "should be set in terms of biodiversity benefits, not numbers of pests killed". A complimentary suite of the "most effective and humane" techniques should be used in an integrated approach. Codes of practice and standard operating procedures should be adhered to "for individual techniques to ensure safety, humanness and effectiveness." Plans need to be integrated for effectiveness and to prevent harmful consequences such as the proliferation of rabbits when foxes and cats are controlled or the targeting of vulnerable native mammals by feral predators when rabbits are controlled.

This advice highlights the limitations and problems with using recreational hunting as a major form of feral animal control. The only way recreational hunting can satisfy these conditions is if it is part of a plan with defined environmental management goals, if on-ground shooting is effective, if only highly skilled and responsible hunters are permitted to participate, and if its effectiveness is monitored. Control programs should not start from the premise that recreational hunting will be used, but should only include it if it meets the goals and conditions of effective control programs.

The Game Council of NSW claims that recreational hunting of feral animals in state forests "can only benefit our native species".⁷⁴ But they base this claim on the numbers fallacy (that control is about increasing the

number of dead pests) that is now rejected in professional control strategies, and they neglect the problems associated with recreational hunting.

To date, it is likely that greater harm than good has resulted from recreational hunting of feral animals, with most species having expanded in range and numbers despite hunting and, in some cases, because of hunting.

The evidence indicates that recreational hunting is not effective as a major or primary method of feral animal control. Where there has been a comparison, professional cullers (using the same or different methods) are far more effective. When the risks of permitting recreational hunting are factored in, there will only be a few circumstances where recreational hunting can be justified as a method of control.

In limited circumstances recreational hunting may contribute to programs, where it is part of an integrated program using other methods as the major form of control method and where there is stringent quality control to ensure that only skilled and ethical hunters are used.

The Invasive Species Council is committed to the control of feral animals. Native species and ecosystems need protection from the devastating impacts of feral animals. But control programs should be well-designed, using the most effective and humane methods, and employing professionals, not amateurs.

Footnotes:

⁷³ Norris et al. (2005).

⁷⁴ Game Council New South Wales (2006).

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