Pindone Rabbit-Baiting: Cruel and Careless?

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Many rural Australians have a dread of rabbits. If they see one or two on their property they have visions of hoards of rabbits teeming over the land, eating all available vegetation, undermining trees and bushes, and destroying everything in sight. Indeed rabbits have been a major problem in many agricultural areas in the past and efforts to eradicate them have included the introduction of the viruses Myxomatosis in 1950 and calicivirus since 1995.

Although calicivirus has been successful in significantly reducing rabbit numbers, some survive and landholders are now ever vigilant of rabbits for fear they may again reach plague proportions. Their efforts in this regard are aided in NSW by the Livestock Health and Pest Authorities (LHPA) in areas where it deems rabbits are too numerous. The LHPA uses calicivirus, poisons such as 1080 and pindone, and habitat destruction, in conjunction with councils and landholders.

Most recently the LHPA has been active in coastal areas of southern NSW, promoting the use of pindone to kill rabbits and training local landholders to use pindone-baits.

The Eurobodalla Shire Council in coordination with the LHPA recently undertook a program of pindone-baiting of rabbits on council land in the area. The Council claims this is in response to complaints by residents about rabbits digging in their gardens and eating their plants. The Council did not undertake any assessment of the risk pindone poses to native wildlife in the area but instead relied on the advice of the LHPA, which in this case recommended the use of pindone and also coordinated landholders in some areas to conduct simultaneous poisoning on their properties

The far south coast of NSW is a rural area supporting a variety of agricultural production and many small landholdings with an intimate mixture of open fields, bush blocks, lakes, swampy areas and National Parks. This coastal zone includes a range of fauna habitats and a wide variety of native species co-existing in close proximity.

A mass poisoning campaign using pindone is an extreme measure. Pindone is a poison that causes rabbits to suffer a slow and painful death and is also likely to kill non-target species including antechinus, possums and bandicoots. Animals and birds that eat dying rabbits or rabbit carcasses, including eagles

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and owls, are also at risk. If baits are not securely protected wallabies and kangaroos may also be harmed.

Every program of pest eradication by poison has to take into account the effect it will have on both target and non-target species. To do this it has to take account of the effects, and the risks, of both primary and secondary poisoning of animals. Primary poisoning occurs when target and non-target animals consume baits; secondary poisoning occurs when predators eat sick animals that have been poisoned or scavengers eat the carcasses of poisoned animals.

A program of pest control that is neither cruel nor careless requires that target animals do not have a slow, painful death and that poisoning is confined to target species. The purpose of this discussion paper is to question the wisdom of organising mass rabbit poisoning programs using pindone.

What is Pindone?

There are two poisons normally used for killing rabbits in Australia; pindone and 1080. Neither pindone nor 1080 are target-specific and can readily kill other animals including humans, pets and wildlife. 1080 is normally used as the preferred poison in rural areas because it kills target animals more quickly. However, pindone is used in urban and urban-fringe areas because its slower killing time, and the availability of an antidote, make it less dangerous to use around humans and pets.

> *Pindone is a first-generation anticoagulant that acts by blocking the synthesis of vitamin K-dependant clotting factors, which causes fatal haemorrhages in susceptible animals. Poisoning with pindone can occur with a large single dose, but it is more effective when given as a series of smaller doses over a period of 4 to 12 days.* (Sharp and Saunders 2004a)

Pindone was declared ineligible for registration in the US and has never been registered in the UK. It is not used in the EU but it is registered in New Zealand for killing rabbits and possums (NRA 2002: 11).

In Australia pindone is normally mixed with either oats or carrots for rabbit-baiting. Both types can be purchased in pre-mixed, ready-to-use products. Pindone concentrate is also available but it is "supplied only to Government agencies and licensed contractors. The concentrate is used by these groups to freshly prepare oat or chopped carrot bait on site for larger programmes" (Animal Control Technologies 2010a).

In August 2010, Pesticide Control (Pindone Products) Order 2010 was gazetted requiring landholders to undertake a course of instruction before using pindone. The easiest course available is a 3 hour course on 1080 and pindone run by the LHPA. Although it is now illegal to use pindone without training a curious anomaly remains whereby anyone can still purchase ready-mixed

pindone baits over the counter without showing credentials. While this anomaly remains pindone can still be used illegally. A maximum $60,000 penalty is prescribed for non-compliance with the new regulation.

The LHPA seems eager to run the course in coastal communities and has been informing residents that there is very little threat to wildlife from either primary or secondary poisoning. However, this doesn't accord with the literature about pindone and it is a possible indication that the course will not pay much attention to environmental issues. An LHPA Media Release about the 1080 and pindone course in the Mudgee area says: "The new training course covers topics such as baiting techniques, toxicity, storage, transport, legislation and OH&S. Those completing the course are issued a certification card and will remain accredited to use 1080 and Pindone for five years." (LHPA 2010a)

The LHPA says of itself that it is "committed to safeguarding agricultural production from the biosecurity risks posed by disease and pests" (LHPA 2010b) but it gives no reason to believe that it has much concern for the protection of wildlife or the humane treatment of rabbits. Since there is very little agricultural production in semi-urban areas where pindone is used, while there is a great deal of wildlife to put at risk, questions arise about the appropriateness of the training the LHPA has to offer residents.

Cruel

The assessment of what is and what is not a cruel or inhumane way to treat animals is a contentious issue. There are extreme views at either end of a spectrum of concern with animal liberationists at one end and defiant, animal abusers at the other end. Neither of these extremes has much support from the general Australian public. The institution with the most influence and established moral standing in Australia on matters relating to animal welfare is the Royal Society for the Prevention of Cruelty to Animals (RSPCA). It would be fair to say that the RSPCA represents Australia's conscience when it comes to the ethical treatment of animals.

On its website the RSPCA has a page titled, "What is the most humane way to control rabbits". Shooting and cage trapping are recommended as the most humane methods of control while 1080 is considered inhumane. In regard to pindone the RSPCA is unequivocal in its criticism and says that it does not consider pindone "an acceptable control method as affected rabbits take several days to die" (RSPCA 2010a).

The RSPCA goes on to say that people who want to learn about different rabbit control methods and their humaneness should read the Model Code of Practice for the Humane Control of Rabbits and associated Standard Operating Procedures published by the NSW Department of Primary Industries (DPI). The DPI is once again unequivocal in its assessment of pindone as an inhumane method of rabbit control:

> *After ingestion of pindone, rabbits initially show signs of depression/ lethargy and anorexia followed by manifestations of haemorrhage including anaemia, laboured breathing, pale mucous membranes and weakness. Bleeding may be visible around the nose, mouth, eyes and anus and animals may pass bloody faeces. Swollen tender joints are common as a result of bleeding into the confined joint space. Discomfort and pain from haemorrhages in internal organs, muscles and joints typically lasts for several days before death. The time to death is around 10 to 14 days after the initial dose. Because anticoagulant poisons take several days to kill, during which time they cause distress disability and/or pain, they are considered inhumane.* (Sharp and Saunders 2004b)

The DPI paper provides a table which rates 15 different methods of rabbit control for their humaneness. Only exclusion fencing and ground shooting are rated as unconditionally humane, although cage trapping is not rated in the table. For those who have heard stories about the cruelty of 1080, the DPI rates 1080 as "conditionally acceptable" whereas pindone is rated "inhumane compared to 1080" (Sharp and Saunders 2004b).

Careless

Whereas the question of cruelty is focused largely on rabbits the question of carelessness centres on the risk of collateral damage — the killing of non-target species. Non-target species include humans and pets, as well as wildlife. There is a great abundance of wildlife in the Eurobodalla area. In fact, there is such a variety of wildlife in the area that we cannot discuss here every species that might be at risk from primary and secondary poisoning.

One way of attempting to reduce the risk of pindone to non-target species is by putting the baits under a mesh canopy. However the effectiveness of such canopies is limited. The canopies used by the Eurobodalla council were simply a V-shaped mesh cover with open-ends held down by tent pegs (see photo below).

Firstly, wallabies and kangaroos can simply knock them over or lift them up to gain access to the poisoned carrots unless they are very firmly tied down. What is certain is that animals small enough to fit through the entrances will have as much access as rabbits to the carrots.

At best the canopies only defend against primary poisoning of larger wildlife. They cannot prevent secondary poisoning. If the pindone baiting program is as successful as the proponents anticipate there will be a constant supply of dead and dying rabbits around for predators and scavengers to feed on. There is no evidence pindone degrades in rabbit carcasses (NRA 2002: 23) and predators and scavengers can accumulate pindone from repeatedly feeding on dying or dead rabbits.

Although some rabbit carcasses may be collected before they are eaten, predators are still at risk from dying rabbits: "Rabbits dying from pindone poisoning can become lethargic and less aware of their surroundings. This can predispose these animals to predation which can in turn place predators at greater risk from secondary poisoning" (Sharp & Saunders 2004a).

A paper published by the NZ Department of Conservation noted that "Reports of anticoagulant residues in predatory birds" and other wildlife "appear to have increased over the last decade, heightening worldwide concern regarding non-target effects" of anticoagulant pesticides. The researchers found that, in terms of secondary poisoning, pindone "has a high risk profile to birds and a medium risk to mammals" (Fisher et al 2004: 6).

Common wildlife at risk of poisoning in the Eurobodalla area includes swamp wallabies, redneck wallabies, kangaroos, possums, antechinus, bandicoots, a variety of birds species and goannas.

Swamp wallabies will be at risk of both primary and secondary poisoning. They are normally herbivores, and so will readily eat carrot baits, but as occasional omnivores they will also eat dead rabbits. (Sceptics can view a YouTube video of a wild swamp wallaby feeding on a rabbit carcass at: http://www.youtube.com/watch?v=furs1s92Sl0.)

Possums are also omnivorous and face the same primary and secondary risks as wallabies. Even if the canopies are properly constructed, routinely used and securely fastened to the ground, possums will still get access to carrot baits. We have been conducting experiments to test which animals will eat carrots and which will gain access to carrots covered in a heavy wire mesh cage with a restricted entrance. We have found that wallabies and possums will readily eat carrots and both possums and swamp wallabies will squeeze through a confined entrance, forcing back the mesh, to get at carrots. Possum mothers carrying young on their backs also allow the infants to dismount and forage independently. (Some of these observations are recorded on a YouTube video at: http://www.youtube.com/watch?v=yEcsNKSb-t0.)

Sea eagles are likely to feed on sick rabbits and rabbit carcasses, as are goannas. There is some limited scientific evidence about the susceptibility of different native species but it is not definitive and a lot depends of how much an individual animal consumes. If there is a feast of dead and dying rabbits for carnivores then it might not mean much that some native species have greater resistance to pindone than rabbits.

There is a surprising number of threatened species that are either known or predicted to be in the Bateman area, which covers most of Eurobodalla. Amongst them are several species of owl (including the Barking Owl), the Spotted-tailed Quoll, the Little Eagle, the Southern Brown Bandicoot, and the Long-nosed Potoroo (DECCW 2010). Members of these species living in the Eurobodalla area might be at risk of either primary or secondary poisoning.

In 2002 the National Registration Authority for Agricultural and Veterinary Chemicals (NRA – now the APVMA) conducted a review of pindone. The reason given for the review was that: "Poisoning during baiting operations of non-target animals using either form of pindone in baits were identified in WA and NSW in particular. States and some community groups have expressed concerns about poisonings of non-target animals, including both intentional and unintentional misuse." (NRA 2002: 9)

Although the review found that "pindone poses a manageable risk to non-target species" throughout the report there are constant references to the limited availability of scientific data and with regard to the persistency of pindone residues it admitted that its findings were "very tentative" and that "firm conclusions cannot be reached". The report went on to say "few specific data are available to determine the likely toxicity of pindone to Australian native fauna, or even to standard test organisms. Available information indicates that a number of native species (macropods, bandicoots, dasyurids, raptors and a range of granivorous birds) are likely to share the high sensitivity of rabbits to pindone". (NRA 2002: 6, 23-4, 39).

The limited data the NRA refers to includes laboratory studies that have found that owls can be poisoned by eating pindone-contaminated mice carcasses and that "raptors appear to share the high sensitivity [to pindone] of rabbits, based on results for wedge-tailed eagles and brown goshawks. Kangaroos also appear highly sensitive, based on results for western greys" (NRA 2002: 26, 30).

Quolls and antechinus were singled out by the NRA as being among the most at risk from pindone baits and it has been reported that,

> *western grey kangaroos, southern brown bandicoots and crested pigeons are confirmed casualties of pindone poisoning campaigns in WA, with poisoning strongly suspected in incidents involving Port Lincoln parrots and juvenile Brahminy kites. Swamp wallabies and young cattle have been killed in NSW. A variety of birds (plovers, quail, rails, wrybills, silvereyes, grey warbles, black-back gulls and*

> *Australian harriers) have been killed in New Zealand*. (NRA 2002: 26, 30-31, 35)

Despite the evidence of environmental threat the NRA's practice of putting agricultural interests before those of environmental protection is still apparent:

> *Some non-target mortality is always likely to occur during control operations that use anticoagulants, but the impact on populations is difficult to measure and has rarely been studied. It can be argued that occasional non-target mortalities should be seen as a reasonable compromise…* (NRA 2002: 33-34).

The NRA conclusion that pindone risks to non-target species are "manageable" is based on a number of superficial assumptions, some of which clearly don't apply to the Eurobodalla area. For instance, the reviewers assumed that: "Many species are likely to avoid open areas where rabbits feed and where pindone baits are laid." (NRA 2002 p.7) This may be true in some places but around the Eurobodalla area kangaroos and redneck wallabies feed in open areas and, at the same time, many properties where pindone baits are likely to be laid remain largely bush covered or adjacent to bush. An intimate mixture of open fields, bush blocks, lakes, swampy areas and National Park provides the Eurobodalla area with a range of fauna habitats and a wide variety of native species co-existing in close proximity.

At the time of the review it was thought that pindone use was quite low but that "If product sales were to rise substantially then the potential exists that an increase in non-target impacts will occur". It was observed that while various "native birds and mammals also appear to share a similar susceptibility to pindone" as rabbits the impact on native animal "populations is difficult to measure and has rarely been studied". (NRA 2002: 7, 33)

Conclusion

There is little doubt that pindone rabbit-baiting is cruel and that the safety of wildlife may be put at risk by the use of this poison. The RSPCA and DPI recognize three methods of rabbit control that are acceptably humane; exclusion fencing, cage trapping, and ground shooting. These three methods would also appear to be amongst the safest for the protection of non-target species. Considering the doubt about the extent of a rabbit problem in the Eurobodalla area it might be much better to apply one or more of these methods in selected areas than to persist with a plan for a mass poisoning campaign over the whole region.

In some states pindone may not be used where significant wildlife populations occur (NRA 2002: 38). The Standard Operating Procedure for pindone of the NSW Department of Primary Industries (DPI) says that "Before commencing a baiting program, an assessment of likely non-target exposure should be performed, preferably by authorized personnel with knowledge of local native fauna" and if there is significant risk of poisoning non-target animals not only

should enclosed bait-stations be fenced to exclude kangaroos and wallabies, but they should not be placed "near areas of native vegetation that is likely to harbor smaller non-target animals" (Sharp & Saunders 2004a). The legally-binding label instructions for pindone also require that: "Where there is significant risk of exposure to non-target animals, measures must be taken to reduce this risk, or baits should not be laid" (Animal Control Technologies 2010b).

Although there has been discussion about using wire mesh canopies to cover baits it is unlikely there will be insistence on exclusion fencing around the baits to keep kangaroos and wallabies away. On top of this, the amount of bush and National Park around Eurobodalla means that baiting can't be confined to areas remote from small mammal habitat, as both the DPI and NRA recommend. Owls that prey on sick rabbits will be particularly at risk.

For the most part, where rabbits cause nuisance in the Eurobodalla area, it is only by nibbling gardens. However, since exclusion fencing is necessary in these areas anyway, to protect gardens and shrubs from wallabies and possums, why not make the fences rabbit proof, as well? If some people think they can avoid exclusion fencing by using pindone it raises questions about whether wallabies and possums will also be targets of the pindone baiting. There are anecdotal accounts of pindone baiting being used to control wallabies in Western Australia (NRA 2002: 46). If this happens it will be totally unacceptable and illegal.

Landholders using pindone will be required to give advance notice to neighbours in person and post warning signs around the boundaries of their property. Pindone baiting will be a very public activity. It remains to be seen how much conflict will arise between neighbours over differences of opinion. Essentially, any conflict is likely to be a matter of differing priorities: an imperative to kill rabbits versus an imperative to maintain humane values and protect wildlife.

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