

**Can the commercial possum fur industry help councils achieve
their possum management goals?**

Bruce Warburton
Landcare Research
PO Box 40, Lincoln 7640
New Zealand

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PREPARED FOR:
Hawke's Bay Regional council
Private Bag 6006
Napier

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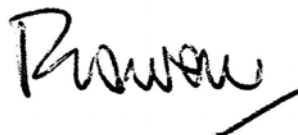
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Reviewed by:

Approved for release by:



Chris Jones
Scientist
Landcare Research



Phil Cowan
Science Team Leader
Pest Control Technologies

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Summary

Project and Client

Because brushtail possums (*Trichosurus vulpecula*) are killed as pests by official control programmes and also killed as a resource (i.e. for their plucked fur and skins), there is ongoing debate as to whether the demand for fur from the commercial industry can provide benefits to large-scale control programmes managed by organisations such as regional councils or the Department of Conservation (DOC). The Hawke's Bay Regional Council (HBRC), through Envirolink funding (HBRC53), requested Landcare Research to facilitate a workshop to discuss where and how the commercial exploitation of possums might best be used to benefit official control programmes. The workshop was held in Napier on 26 February 2008.

Objectives

To facilitate a workshop of HBRC staff, contractors, and fur industry representatives to:

- Identify how best to capitalise on the potential that the commercial possum fur industry might have for benefiting possum control, and
- Provide advice on how best these opportunities might be realised.

Main Findings

- The possum fur industry (including both plucked fur and fur-on skin) is growing, but because of the large areas of the country that are under official control, the industry has concerns about continuity of supply.
- Some control contractors are harvesting fur as a top-up to their contracting income, but as yet, the HBRC is not receiving any direct savings to their control costs through reduced tender prices.
- Possum fur prices are unlikely ever to be high enough to provide sufficient financial incentive to contractors carrying out maintenance control.
- Several non-monetary benefits were identified, including reduced use of toxins, contracting staff retention, improved public perception of council operations through reduced use of toxins and of productive use of killed possums, and perhaps more effective possum control.
- A significant role may exist for commercial harvesting of possums as part of a three-way partnership between DOC, regional councils and commercial fur harvesters to create a 'dispersal buffer' in uncontrolled areas adjoining current council possum control programmes. Nationally the most significant of these in both political and resource terms is uncontrolled DOC-managed lands adjacent to council large-scale possum control programmes. Properly structured, this dispersal buffer partnership may provide significant benefits to all parties.
- The potential benefits of fur harvesting for creating such buffers needs to be evaluated in rigorously designed trials.

Recommendations

The HBRC should:

- Be aware of the limited potential that current fur prices offer for offsetting possum control costs, particularly for maintenance control, within existing council-managed programmes.
- Acknowledge the range of potential non-monetary benefits that accrue from the commercial harvest, and take these into account when considering the value of the commercial fur harvest in the context of regional possum control programmes.
- Support the establishment of some trial (experimental) sites to assess the potential that commercial fur harvesting has for establishing dispersal buffers, and what effect such buffers might have on numbers of dispersing possums.

1. Introduction

Because brushtail possums (*Trichosurus vulpecula*) are killed as pests by official control programmes and also killed as a resource (i.e. for their plucked fur and skins), there is ongoing debate as to whether the demand for fur from the commercial industry can provide benefits to large-scale control programmes managed by organisations such as regional councils or the Department of Conservation (DOC). The Hawke's Bay Regional Council (HBRC), through Envirolink funding (HBRC53), requested Landcare Research to facilitate a workshop to discuss where and how the commercial exploitation of possums might best be used to benefit official control programmes. The workshop was held in Napier on 26 February 2008.

2. Background

Introduced brushtail possums (*Trichosurus vulpecula*) have been harvested for their fur in New Zealand since 1921. The industry peaked in 1981 when 3.4 million skins were exported. Since then demand for fur-on skins has been weak, but since 1992 there has been an increasing demand for plucked fur that is woven with merino wool to produce high quality yarn (e.g. Merino mink™, Perino™). The possum-fibre-based industry has been developed over the last 15 years and has grown at about 10% per year over the last 7 years.

The use of plucked possum fur as a component in blended yarn is now well established in the New Zealand yarn industry with the total value of this industry estimated to be in the order of \$50 to \$70 million per annum. To service the current industry about 1 000 000 possums are harvested per annum with about 80% of the fibre being processed into yarn for manufacturing in New Zealand.

The global demand for fur-on skins is also increasing with new and emerging markets in Asia/China and India, and with global demand for fur currently exceeding supply for all furs both wild and farmed. At present about 200 000 possum skins are harvested each year in New Zealand, with both raw and dressed skins exported. There has been renewed interest in both dressed and raw possum skins from offshore, but processors and manufacturers have been hesitant to enter into contracts with overseas buyers without some guarantee of supply of the raw product.

Historically, demand for skins has been cyclical and driven by international fur prices and current fashion demands. In contrast, possum fibre, when used as a yarn, has created an alternative market niche, which is less susceptible to the effects of the international fur market. Consequently, changes in price are, and will continue to be, dampened compared with historical fluctuations.

Because possums are controlled extensively in New Zealand for bovine Tb management, agricultural production protection, and conservation protection, the yarn-based industries are concerned about security of supply and the 'waste' of product when possums are killed as part of control operations. Consequently, the question is often posed – can the fur industry and pest control agencies work together for mutual benefit? A workshop was held in Napier

on 26 February 2008 to discuss the potential benefits that the fur industry might contribute to regional council possum control programmes.

3. Objectives

To facilitate a workshop of HBRC staff, contractors, and fur industry representatives to:

- Identify how best to capitalise on the potential that the commercial possum fur industry might have for benefiting possum control, and
 - Provide advice on how best these opportunities might be realised.
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4. Methods

A workshop was convened in Napier (26 February 2008) and was attended by:

Bruce Warburton (Landcare Research, facilitator)
Campbell Leckie (Hawke's Bay Regional Council)
Alan Beer (Hawke's Bay Regional Council)
Rod Dickson (Hawke's Bay Regional Council)
Dean Roughton (Hawke's Bay Regional Council)
Steve Ellis (Taranaki Regional Council)
Steve Boot (Basically Bush)
Gordon McKie (Baytrap contractors)
Graham Higginson (Trappers NZ)

The workshop focused on two specific questions:

1. What are the potential benefits of integrating commercial recovery into control programmes?
 2. How can commercial recovery best be used to benefit possum control programmes?
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5. Findings

5.1 Industry update

The current possum fur industry is growing steadily and the demand for fur has resulted in prices for plucked fur reaching \$105/kg. Depending on size, about 15–23 possums are needed to be plucked to harvest 1 kg of fur. Because most possum fur is processed in New Zealand there are no official records of the tonnage of fur harvested, but Basically Bush, which is the largest procurer of fur, estimates that up to 70 tonnes of fur have been harvested over the past 12 months (Fig. 1). Using a conversion of 20 possums per kilogram of fur, this tonnage equates to a harvest of about one million possums. Along with possums that are killed for the fur-on-skin trade (about 100 000 – 200 000) the total kill resulting from the commercial fur trade is likely to be in the order of 1.3–1.5 million.

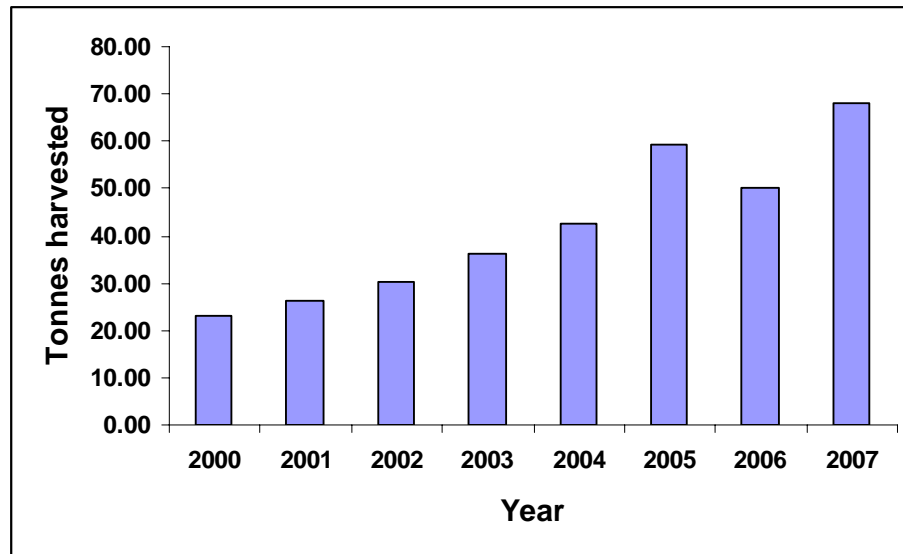


Fig. 1 Trend of increasing tonnage of possum fur harvested from 2000 to 2007. Data based on estimates of plucked fur production.

Most possums targeted for fur removal are trapped using leghold traps, because fur is easily plucked from freshly killed animals but can only be plucked using a machine once the animal has cooled.

Fur is harvested by sole operators who obtain a major part of their income (either annual or seasonal) from fur, by control contractors who top-up their income by collecting the fur from possums killed during official control programmes, and from a range of part-time collectors. If fur is providing the trappers' sole income, they need to harvest 50–60 possums per day to achieve a reasonable income. Depending on whether the trapper is trying to harvest at a sustained level (i.e. harvest the same number of animals each year) or is trying to maximise their harvest in any one year, to obtain 50 possums per day will result in two contrasting post-harvest densities. For example, if possums are harvested sustainably, and 50 possums are required per day to provide an acceptable economic return, and at best trappers can operate 200 traps set for 5 nights per week, then the density at which 50 possums per day (i.e. 250 per week) can be harvested from 1000 trap-nights requires a mean catch rate (i.e. Trap-Catch Index, TCI) of about 30–35%.

However, if the trapper is willing to harvest the capital stock as well as the sustainable harvest (using 200 traps set per day), then an average of 50 possums per day can be obtained economically by reducing a population from, for example, a pre-harvest abundance of 60% TCI down to perhaps as low as 5% (see Fig. 2 and caption for details). If the starting density is about 40% TCI, then operating economically (i.e. averaging 50 possums per day) would only reduce the density down to about 17% (Fig. 2).

At present it is not known at what possum density (as indexed by TCI) trappers can economically operate, but one important factor is ease of access. That is, blocks that have quad-bike access can be more efficiently harvested than fully forested blocks that have only foot access.

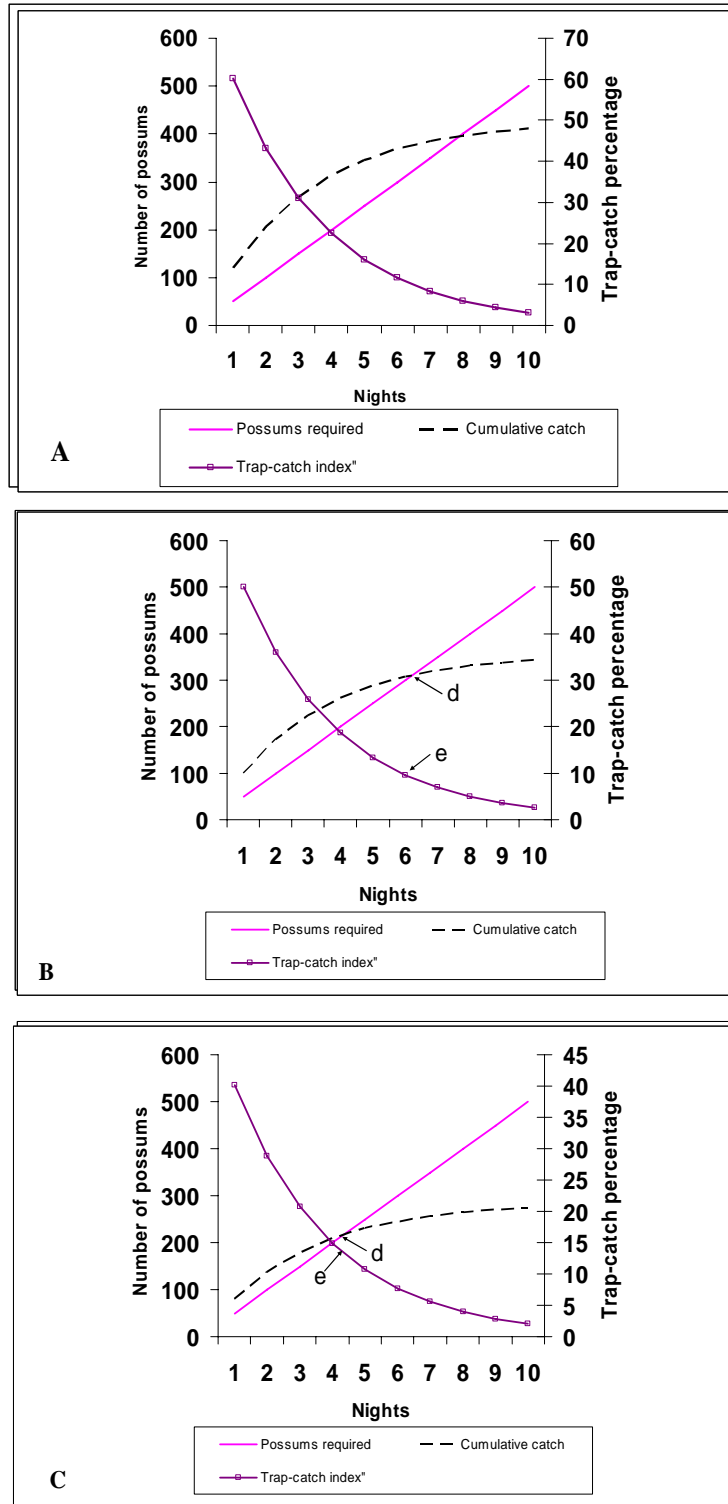


Fig. 2 Relationship between cumulative catch per night, economic number of possums required, and resulting trap-catch index. Graph A has starting trap-catch of 60%, B 50%, and C 40%. The following explanation relates to graph A, but applies equally to B and C. The straight line denoted by (a) shows the number of possums required for each additional day trapped (i.e. it starts at 50 and increases by 50 each day). Curve (b) shows the declining TCI

as possums are removed. Curve (c) is the cumulative catch, starting at 120 (i.e. 60% of 200 traps) and then increasing but at a declining rate as the TCI declines. At point (d) the number of possums caught equals the minimum number of possums required, and to trap for more nights would result in the trapper making a loss. When the trapper gets to point (d) on night 8 for Graph A, the TCI has been reduced to point (e), which is at about 5%. So when starting at a lower density, trappers will have fewer nights to trap and still be economical and the resulting TCI will be higher than if the starting density was higher. That is, having a higher start density enables more than 50 possums to be caught per day which then ‘subsidises’ the loss at the lower densities.

5.2 Potential benefits of integrating commercial recovery into control programmes

If regional councils and other possum control agencies are to seriously consider integrating fur harvesting into their official control programmes, there needs to be real benefits for those programmes. These benefits could be both financial (i.e. a reduction in control costs), or non-monetary (e.g. improved public acceptance of control programmes).

Reduction of possum control costs

Although some possum control contractors are currently harvesting fur from possums, they do not appear to be using this additional income to reduce their contract price. Consequently, the Hawke’s Bay Regional Council is not receiving any direct economic benefit from the fur industry. The amount of additional revenue that contractors gain from harvesting fur depends on the density of the possum population they are controlling. Thus, contractors that are carrying out initial control contracts (i.e. starting with high possum densities) have the greatest potential to generate a reasonable income from the fur harvested. From a sample of initial control operations that had contract prices ranging from \$12 to \$17 per hectare, the additional income obtained from fur ranged from \$3/ha to \$5/ha (data supplied by Gordon McKie).

Contractors appear reluctant to reduce their contract tender prices because: (1) when they tender for a contract they do not know what the density of possums is, and therefore do not know the number of possums from which they are likely to recover fur, (2) the contract prices are already very competitive and reducing these prices and therefore essentially losing the additional revenue from the fur would reduce the incentive for the trappers to stay in the industry, and (3) having the additional fur incentives appears to increase the effort trappers apply both in terms of intensity of control and coverage. Consequently, the additional income obtained by harvesting the fur provides an incentive that increases the probability of the contractor achieving the contract target RTC and getting paid.

A sample of contract operations that had a target TCI of 5% had actual TCI values ranging from 0.4% to 1.7%. If such low RTC values are achieved routinely, then there are potentially significant cost savings to the council through delaying the initiation of maintenance control. For example, if the target RTC required by the council is 5% and the actual post-control RTC is 4% then maintenance control will need to be initiated within 1–2 years to ensure the population is held below 5% RTC. However if the post-control RTC is 1%, then maintenance control would not, at least theoretically, be required for up to 6 years. This extended period between initial control and the need to start maintenance control should provide the council with significant cost savings. However, such savings are not realised because maintenance control is funded by the landowner (i.e. the council only funds the initial control). Even so,

the council pays for bait stations and bait used by the landowners, so at least these costs could be defrayed.

Against this rationale, some possum control contractors have been reluctant to embrace the potential benefits of harvesting fur, arguing that such incentives distract trappers from achieving their required target RTC levels, but instead encourage them to lift their traps early to enable them to shift them to more productive areas. Although such perverse incentives could operate, such problems appear to be largely a contractor staff management and operational implementation issue around commercial fur recovery on contracts and could be managed by ensuring traps are not lifted until certain catch rates are achieved for a given number of trap-nights. There are a number of contracts using very high quality contractors within the Hawke's Bay, who routinely achieve RTC results below 2% on initial control operations, where staff pluck fur for a bonus.

The HBRC's current possum control programme aims to have about one million hectares under maintenance control by 2016, with possum abundance at or below a 5% RTC. When maintaining possum populations at such low levels there are very few possums killed per unit of control effort, and therefore little opportunity to supplement control costs with fur income. For example, if a contractor was using 200 traps set for 11 days in an area that had a possum population at 5% RTC, then they would only catch about 100 possums (i.e. a fur value of about \$500 compared to a wage cost of about \$3,000). Although some contractors do collect fur from possums killed during maintenance operations, there is little benefit to be obtained from doing so (unless leghold traps are being used and therefore checked daily). For maintenance control to be fully funded by commercial fur recovery, the cost required per possum for such harvesting to be economical is considerably more than the current price of about \$5 per possum (Fig. 3).

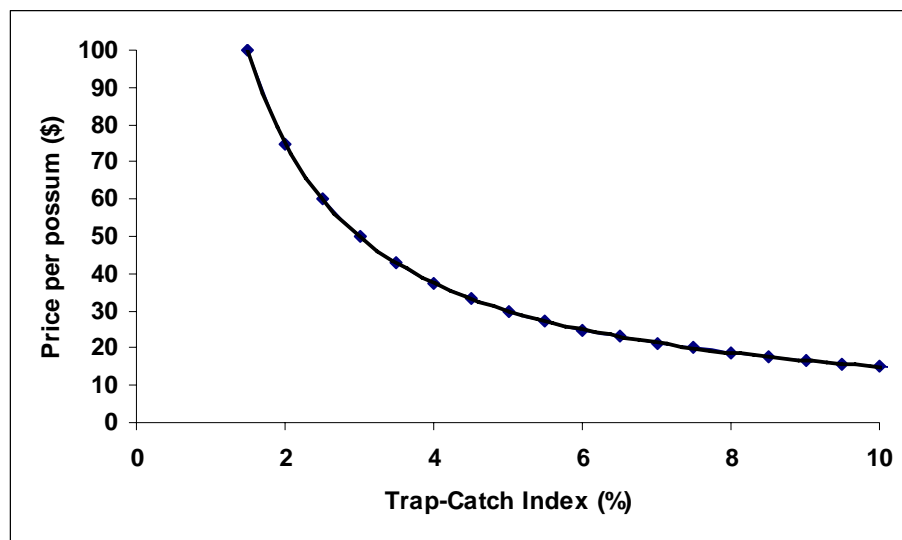


Fig. 3 Price required per possum for harvesting economically at decreasing trap-catch values.

Non-monetary benefits from harvesting possums

Although current fur harvesting does not provide any direct savings for the HBRC, there are a range of potential non-monetary benefits that the council can acknowledge and take into account when considering the value of the commercial fur harvest. These include:

1. A decreased use of toxins. Because contractors want to be able to easily pluck the fur from possums there has been an increase in use of leghold traps and therefore a corresponding decrease in the use of toxins. This increase in use of leghold traps has also (at least anecdotally) increased the effectiveness of the control operations by overcoming any poison-shyness issues. A potential downside of the increased number of leghold traps used is the perceived animal welfare problems associated with these traps. That is, if leghold traps are replacing Feratox® or kill traps then there are potential additional welfare costs.
2. Retention of contracting staff. There is a general acknowledgement that contract prices are very competitive and therefore any additional income generated from harvesting fur is seen as an aid to keeping experienced control contractors in the industry. At this stage it is not possible to quantify this benefit.
3. Public perception. If the HBRC can show the public that there has been a significant decrease in the use of toxins in the region and that possums killed are not being wasted, but instead are being used to supplement incomes of people from local communities, then there are potential social and cultural benefits for the council in integrating the commercial industry into their control programmes even if there are no direct financial benefits.
4. More effective control coverage. Although data are only anecdotal, there is a suggestion that the fur incentive encourages contracting staff to venture into less accessible areas that would normally have been avoided or only controlled superficially without such incentives. If this is true (and there is some debate about whether it is), then there are benefits to the HBRC through more effective control uniformly applied across the region. As discussed above there is also an indication that the fur incentive results in lower post-control RTC levels than would be achieved without the incentive.

5.3 How can commercial fur recovery best be integrated into control programmes?

There was general agreement at the workshop that within the rateable region administered by the HBRC there were unlikely to be (at least at current market prices) significant direct economic benefits accruing to the council (i.e. reduced contractor prices) from the commercial harvesting of possum fur. However, both the HBRC and Taranaki Regional Council (TRC) have possum control programmes that border either non-programme rateable land (e.g. the TRC's Self-Help programme does not extend over the total region) or border non-rateable land (e.g. DOC-managed land). In both cases, the council programmes have extensive boundaries that are not protected from potential dispersing possums. The HBRC Possum Control Area programme has about 450–550 km of Crown-managed boundary and 80–120 km of boundary contiguous with the Gisborne District Council. The Taranaki

Regional Council has approximately 150 km of rateable land adjacent to its Self-Help programme that is largely uncontrolled.

Given that much of this boundary land is not being treated through any official control programme, possum numbers across most of these boundary areas are known to be high.

These boundary areas (particularly those with DOC-managed lands) present a significant source of reinfestation for control programmes on rateable land. This is a major concern to councils across New Zealand and often on a large scale in a number of regions. Large-scale reinfestation from Crown-managed lands has the potential to compromise the success of council programmes such as those delivered on rateable land in the Hawke's Bay, Taranaki, and Manawatu-Wanganui regions. The threat of reinfestation may lead land-users to refuse to participate in council-based programmes, and if DOC is not funded to meet its RPMS exacerbator control obligations, councils may then need to fund control or see their programme objectives compromised. This issue of Crown contributions to regional pest management strategies is largely being driven by the Animal Health Board withdrawing from areas of Crown lands on which it has undertaken successful possum control. The issue has been vigorously discussed with central government at the regional council chief executive and regional chairs level, with little progress made over the last five years (C. Leckie pers. comm.).

Consequently, there is an opportunity in these 'boundary' areas for commercial harvesting of possum fur to be used to create a 'dispersal buffer', but the effectiveness of such a strategy will depend on how low possum numbers can be reduced to, and what effect that has on immigration rates of possums into adjoining council control areas. This opportunity exists on any uncontrolled land adjacent to council programmes but is a potentially significant opportunity on uncontrolled DOC-managed lands. A three-way partnership between DOC, regional councils and commercial fur harvesters would benefit each party significantly. DOC would get a level of possum control at very low cost in areas it currently is not funded adequately to control, and if these areas are left untreated major political and relationship issues between DOC, councils and their communities may arise. Councils will get a reasonable level of control at very low cost on untreated lands that have the ability to compromise their large-scale community possum control programmes. Commercial fur harvesters will get access facilitated by councils and DOC to large areas of terrain that they may not easily access otherwise. This access would need to be managed (perhaps using some preferential permit system) to maximise the ability of fur harvesters to reduce possum numbers in a way that is commercially profitable to them, meets council and DOC health and safety requirements, and delivers a significant reduction in possum numbers. How effective this would be will depend on a number of factors:

1. There would need to be incentives for trappers to target these areas. This could be achieved by councils facilitating access and managing a 'harvesting block' system so trappers have some continuity of access that allows them to become familiar with an area, and if appropriate, set up some infrastructure (e.g. tracks) to increase access efficiency.
2. Fur prices would need to be sufficient to enable trappers to reduce possum numbers low enough that there were real benefits in reduced dispersal rates.

3. For any given fur price, the optimal trapping effort needs to be identified (i.e. is it more effective to harvest sustainably at a fixed density or significantly reduce densities and then leave for several years until numbers recover?).
4. DOC staff would need to be convinced of the benefits from the partnership so that they were supportive of the initiative. Firstly, as a non-rateable neighbour, they would be seen as a 'good neighbour' if possum numbers are reduced on their lands. Secondly, depending on the resulting densities, there could be conservation benefits resulting from the reductions in possum numbers.
5. There might need to be some level of monitoring and audit to determine (1) what TCI possums have been reduced to and (2) what effect control is having on immigration rates. It is unclear at this stage what level of monitoring would be required, but because little, if any, council funds (rates) would be spent, there should be few legislative requirements for monitoring. Nevertheless, some monitoring will be required, but it will vary depending on the desired outcomes.
6. Where fur is being harvested on a large scale with access facilitated by DOC and councils there would need to be a level of coordination undertaken by the commercial fur recovery industry of individual fur recovery operators. To reduce administrative costs associated with this proposed programme, both DOC and regional councils may prefer to deal with one individual or organisation, who then is responsible for ensuring individual fur operators are meeting health and safety and other programme requirements.

These additional factors need to be worked through to evaluate the viability of using commercial fur harvesting to create a 'dispersal buffer' on uncontrolled council or DOC managed lands. The workshop members agreed that there is a need to initiate robust field trials that will test the implementation of the concept. These trials will provide quality information for both council staff and possum contractors, showing whether commercial fur harvesting can help create and maintain boundary-control dispersal buffers.

6. Conclusions

- The possum fur industry (including both plucked fur and fur-on skin) is growing, but because of the large areas of the country that are under official control, the industry has concerns about continuity of supply.
- Some control contractors are harvesting fur as a top-up to their contracting income, but as yet, the HBRC is not receiving any direct savings to their control costs through reduced tender prices.
- Possum fur prices are unlikely ever to be high enough to provide sufficient financial incentive to contractors carrying out maintenance control.
- Several non-monetary benefits were identified, including reduced use of toxins, contracting staff retention, improved public perception of council operations through reduced use of toxins and of productive use of killed possums, and perhaps more effective possum control.
- A significant role may exist for commercial harvesting of possums as part of a three-way partnership between DOC, regional councils and commercial fur harvesters to create a

dispersal buffer in uncontrolled areas adjoining current council possum control programmes. Nationally the most significant of these in both political and resource terms is uncontrolled DOC-managed lands adjacent to council large-scale possum control programmes. Properly structured, this dispersal buffer partnership may provide significant benefits to all parties.

- The potential benefits of fur harvesting for creating such buffers needs to be evaluated in specially designed trials.

7. Recommendations

The HBRC should:

- Be aware of the limited potential that current fur prices offer for offsetting possum control costs, particularly for maintenance control, within existing council-managed programmes.
- Acknowledge the range of potential non-monetary benefits that accrue from the commercial harvest, and take these into account when considering the value of the commercial fur harvest in the context of regional possum control programmes.
- Support the establishment of some trial (experimental) sites to assess the potential that commercial fur harvesting has for establishing dispersal buffers, and what effect such buffers might have on numbers of dispersing possums.

8. Acknowledgements

I thank Campbell Leckie for supporting this work, Rod Dickson for organising the workshop, Gordon McKie and Graham Higginson for freely providing harvesting information, Steve Boot for coordinating the commercial fur recovery industry participants, and Chris Jones for refereeing a draft of the report. Also thanks to all the workshop participants who contributed freely and productively.