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ENHANCED FOX MANAGEMENT PROGRAM – PHASE 2
BASELINE SURVEY

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ABSTRACT: The Enhanced Fox Management Program was introduced in 2002 as part of a Victorian Government initiative to minimise the impact of foxes on environmental, economic and community values. Phase 1 involved a one-year fox bounty trial. Phase 2 replaced the bounty and aimed to increase coordinated baiting participation rates amongst land managers in sheep producing areas of Victoria. This paper reports on a baseline survey conducted as an evaluation component of the second phase, that collected information on motivation for fox control and methods used, perception of control success, and current baiting practice. The survey found 27% of land managers in sheep producing areas currently use baiting to control foxes, and 58% of those baiting coordinate their baiting with neighbours. Barriers to achieving program success will be the reluctance of land managers to view fox control as a community responsibility rather than an individual business activity, resistance to the use of 1080 baits because of the perceived risk to dogs, and the perceived administrative ‘red tape’ burden associated with baiting. The survey will be readministered after autumn baiting in 2005 to assess the impact of the Enhanced Fox Management Program phase 2.

INTRODUCTION

A three-year Enhanced Fox Management Program (EFMP) was introduced in 2002 as part of a Victorian Government initiative to minimise the impact of foxes on environmental, economic and community values. As part of the EFMP, a fox bounty trial was introduced across Victoria in July 2002 to reduce the number of lambs killed by foxes. A bounty of $10 was paid on each complete fox tail or fox tail skin deposited by a resident of Victoria at approved government works depots around the State. Bounty applicants were required to provide their personal details and information on where and when the foxes were taken.

An evaluation of the bounty trial found that it failed to reduce fox numbers to critical levels below which a long-term negative rate of population growth could be expected. The evaluation report recommended that the bounty trial be discontinued and replaced with targeted and coordinated programs predominantly based on baiting, to assist landholders to achieve a sustained reduction in fox abundance for a defined benefit (VIAS 2003).

The second stage of the EFMP was therefore developed to:

- Motivate the community to manage foxes on private land in a more coordinated, long-term and strategic manner;
- Increase broad-scale group-coordinated fox control programs on private land;

Monitoring programs were implemented to determine the efficacy of these community-based fox control programs and to provide information to landholders to improve the management of foxes.
The baseline survey is an evaluation component of the second stage of the EFMP and forms the 'before' of a 'before & after' comparison. The purpose of the survey is to provide baseline information on:

- landholder perception of fox problems and their response to the problems,
- general control, motivation and perception of success,
- baiting practice,
- attributes of baiters and non-baiters.

**METHODS**

Telephone interviews were conducted in January 2004 with 503 managers of private agricultural properties with an area greater than 10 hectares, in four sheep producing regions of Victoria (Edenhope, Euroa, Hamilton and Underbool). A stratified sampling design was used, with the sample size in each region being proportional to the total number of properties greater than 10 hectares in those regions, estimated from the Vicmap Property digital map layer. Lists of all telephone numbers for each region were generated, from which a random sample was taken.

Because improved baiting practice is a specific objective of the EFMP, it was necessary to ensure that large enough sub-samples of current 'baiters' were obtained to capture reliable baseline data. For this reason, quotas were imposed on the random samples. Numbers of baiters and non-baiters sampled randomly were recorded, but once the quotas for non-baiters in each region were reached, subsequent non-baiters were excluded from the final sample. Case weights for each observation in the final sample were then calculated to reflect the sample fraction relative to the population fraction. These weights were used within all statistical calculations to remove the bias associated with differential quotas. All percentages, means and significance levels reported in this paper are population estimates based on a case-weighted analysis of the survey results. Full details of the sampling design and case weighting are available in McGeary (2004).

A response rate of 30.3% was achieved. This took into account those excluded because quotas of non-baiters were exhausted. Totals for both the random sample and the final survey sample are shown in Table 1.

**Table 1.** Sample sizes

<table>
<thead>
<tr>
<th>Baiting Practice</th>
<th>Region</th>
<th>Edenhope</th>
<th>Euroa</th>
<th>Hamilton</th>
<th>Underbool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baiters</td>
<td>Random sample</td>
<td>30</td>
<td>57</td>
<td>78</td>
<td>32</td>
</tr>
<tr>
<td>Non-baiters</td>
<td>Survey sample</td>
<td>64</td>
<td>95</td>
<td>201</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total 592</strong></td>
<td></td>
<td><strong>94</strong></td>
<td><strong>152</strong></td>
<td><strong>279</strong></td>
<td><strong>67</strong></td>
</tr>
<tr>
<td>Baiters</td>
<td></td>
<td>31</td>
<td>64</td>
<td>78</td>
<td>32</td>
</tr>
<tr>
<td>Non-baiters</td>
<td></td>
<td>58</td>
<td>87</td>
<td>133</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total 503</strong></td>
<td></td>
<td><strong>89</strong></td>
<td><strong>151</strong></td>
<td><strong>211</strong></td>
<td><strong>52</strong></td>
</tr>
</tbody>
</table>
RESULTS

1. Landholder perception of fox problem and response to problem

Overall, the perception of foxes as a problem is high, with 80.2% of land managers believing foxes are a problem in their neighbourhood and 66.9% of land managers having done something since July 2002 to control foxes on the property they manage. Of those not controlling foxes, 60.2% claim they “do not have a real problem with foxes, or do not see many foxes”. Other reasons given for not controlling foxes include “neighbour controls them” (8.4%), and “don’t have a chemical licence/course certificate” (4.2%).

Of those respondents who recognise foxes as a neighbourhood problem, 13.3% have not attempted some form of control on their own property. The most common reason given is that foxes are not a real problem. This implies that respondents are distinguishing between foxes being a neighbourhood problem and being a problem on their own property.

2. General control, motivation and perception of success

Of those doing some fox control, 60.7% claim they were prompted to action by “foxes killing or attacking lambs”. This rises to 75.1% when losses of all types of livestock are counted. The next most common reasons given were “there are a lot or increased numbers of foxes” (5.1%), and that “fox control is a regular part of a farming program” (4.2%). Only 2.1% claimed they were prompted to undertake fox control to “protect livestock on neighbouring properties”. This has implications for involvement in coordinated group baiting campaigns.

Shooting was the most common fox control method used (88.9%), followed by baiting (40.6%) and then den destruction (37.9%). Respondents were asked to rate the level of effectiveness on a scale from 1 (not at all effective) to 5 (very effective) of all the control methods they nominated. Taken individually, shooting was rated as more effective than all other methods (3.75), with baiting the next most effective (3.47). Of all those land managers who use baiting as a control method, 87.8% use it in combination with at least one other method, most often with shooting. Mean effectiveness ratings for baiting ranged from a high of 3.81 when baiting is used alone, to a low of 3.24 when baiting is combined with a method other than shooting. It is likely that those with higher confidence in the effectiveness of baiting see less need to complement it with other methods.

Respondents who indicated they had done some fox control since July 2002, but had not used baiting were asked if they had ever used baiting in the past. A total of 29.9% indicated they had. The reason given most often for no longer using baiting was the risk baiting posed to dogs or actually having lost a dog through baiting (32.6%). The next most common reason given was a lack of confidence in the effectiveness of baits (27.6%). Concerns about there being too much red tape to obtain a permit or not being able to purchase bait without a licence also rated highly (23.1%).

3. Current baiting practice

Baiting frequency and timing

Since July 2004, 27.1% of the land managers surveyed in sheep producing areas of Victoria have used baiting to control foxes. Of those, most (67.4%) usually bait once a year, with only 17.8% usually baiting more often. Figure 1 shows that lambing or kidding generally occurs between March and September, with peaks in April-May and August-September. Baiting activity is
highest in autumn, with peaks apparent approximately a month before autumn lambing peaks. No corresponding baiting peak appears before spring lambing.

![Graph showing baiting and lambing months reported by land managers surveyed in sheep producing regions of Victoria.]

**Fig. 1.** Baiting and lambing months reported by land managers surveyed in sheep producing regions of Victoria.

Respondents who bait were asked how they decide when to start their baiting program. A total of 59.5% start to coincide with their own lambing, another 30.7% start when foxes are noticed, and only 7.8% are motivated to start baiting to coincide with neighbour or group baiting programs. However, 58.1% of those baiting do so in a group with their neighbours at least some of the time. Most respondents start baiting before lambing starts (84.7%), although 13.7% start baiting at the same time as lambing starts, and 1.6% start after lambing begins. Of those respondents who nominated the time before lambing or kidding at which they start baiting \((n=154)\), 32.6% start four weeks before, while 27.3% start baiting less than three weeks before lambing. The mean number of weeks before lambing is 4.9.

Of those baiting, 37.8% decide to stop their baiting program when baits stop being taken. A further 28.0% stop when they have no more baits to put out. Another 19.3% stop when lambing has finished. A further 6.2% stop when fox activity stops and 2.9% cease baiting once lambing starts.

**Maintenance of bait sites**

Of those baiting, 41.8% claim to check the bait sites every day, and a high 85.7% claim to check them every four days or more often. While 99.2% of baiters claim to check bait sites, only 66.5% claim to replace baits if they have been taken. This implies 32.7% of baiters are checking the bait sites but not replacing taken baits.
Baiting density
On average, land managers lay bait on 59.9% of their properties, with 19.3% baiting over the entire property. A baiting density of at least one bait per 10 hectares is achieved by 45.3% of those baiting, with a median baiting density, including replacement baits, of 1.042 baits per 10 hectares.

4. Attributes of baiters and non-baiters
As property size increases, so too does the likelihood that baiting has been used as a fox control method ($\chi^2 = 63.956, p < 0.0005$). Land managers operating a farm business on their property are significantly more likely to have used baiting to control foxes than those not operating a farm business ($\chi^2 = 18.076, p < 0.0005$), and those breeding livestock on their property are significantly more likely to have used baiting to control foxes than those not breeding livestock ($\chi^2 = 21.456, p < 0.0005$). Those actively involved in a landholder group are significantly more likely than non-members to have used baiting to control foxes ($\chi^2 = 34.630, p < 0.0005$), and to have coordinated their baiting with neighbours ($\chi^2 = 7.477, p = 0.024$). Males are significantly more likely than females to have used baiting to control foxes ($\chi^2 = 18.471, p < 0.0005$).

5. Additional comments
Respondents were given an opportunity at the end of the questionnaire to add comments. Of all respondents, 43.7% had something to add. The desire to keep the bounty was by far the most often mentioned comment. Non-baiters were not significantly more likely to make this comment than baiters.

CONCLUSIONS
The EFMP program aims to improve coordinated baiting participation rates amongst land managers in sheep producing areas of Victoria. Based on the survey results, an estimated 27% of those land managers use baiting to control foxes, and 58% of those baiting coordinate their baiting with neighbours. Most are prompted to bait to coincide with their own lambing, with only 2% baiting to protect livestock on neighbouring properties. A further 8% believe that because their neighbours are controlling foxes, there is no need for them to undertake any fox control on their own properties.

It is anticipated that the biggest barrier to the program achieving success will be the reluctance of land managers to view fox control as a community responsibility rather than an individual business activity. The aim of increasing spring baiting participation rates will be more difficult to achieve in regions such as Underbool and Edenhope where lambing, and therefore traditional baiting, occurs only in autumn months. Resistance to the use of 1080 baits because of the perceived risk to dogs (33% of those no longer baiting) as well as the perceived ‘red tape’ burden (23% of those no longer baiting) will also be difficult to overcome.

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REFERENCES

