

Public perceptions of foxes and fox eradication in Tasmania

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ABSTRACT

The red fox *Vulpes vulpes* is one of the most destructive invasive species in mainland Australia and has recently been introduced to Tasmania. This paper reports the results of a survey conducted in Tasmania in mid-2006, to ascertain the public's views about foxes, their presence in Tasmania and what, if anything, should be done about them if, in fact, they are present. The survey found that public opinion among Tasmanians surveyed was overwhelmingly and vehemently opposed to the presence of foxes and indicated a high public expectation that there would be action by the authorities, scientists and others to remove them and/or prevent their further entry to the State. The minority of respondents who dissented from this view were chiefly in the "don't know" category, and required further information. The variation in responses by age to this and other questions indicates the desirability of a stronger communication focus on younger Tasmanians about foxes, the risks they pose and the need to use scientific methods to control them.

Key words: Invasive species, Community survey, *Vulpes vulpes*

Introduction

The European Red Fox *Vulpes vulpes* was introduced into Australia for sport in the late 19th Century, and is responsible for extensive damage to livestock and for the extinction and decline of numerous indigenous species (Saunders *et al.*, 1995; Short 1998). Until recently, Tasmania was the last major temperate region of Australia free of the fox despite occasional incursions very early in European colonisation, one being trapped in 1972 and one escaping a ship at Burnie in 1998 (Saunders *et al.* 2006, DPIPWE website). However, since 2001 it has become increasingly clear that foxes are present on the island, with four fox carcasses having been discovered since 2001 (Ross 2006; Saunders *et al.* 2006), one scat containing fox hair and a further 42 scats testing positive for fox DNA (DPIPWE website). Genotype could be obtained from 8 of these 42 scats and all were identified from separate animals and included males and females (Berry *et al.* 2007; Berry 2009a, b; DPIPWE website). Numerous fox sightings have also been reported since the late 1990s (Saunders *et al.* 2006). If foxes were to become abundant in Tasmania, they would have a devastating effect on both the livestock and ecology of the island (Saunders *et al.* 2006).

In 2002, after an initial emergency response, the Tasmanian State Government established the Fox Free Taskforce, now the Fox Eradication Branch of the Department of Primary Industries, Parks, Water and Environment (DPIPWE), which is the lead agency responsible for investigating the presence of foxes in Tasmania (e.g. reported sightings) and implementing eradication programs across the State. In the preface to their report, Saunders *et al.* (2006) comment: "In response to... recent possible [fox] incursions, the Tasmanian Government established the Fox Free Taskforce. This body has the responsibility of investigating reports of fox evidence and sightings and of taking appropriate

actions, including managing, controlling and monitoring fox introductions and activity, and implementing eradication programs as needed across the State. Since 2002, the Taskforce has received more than 1000 reported sightings of foxes (reports that have varied from poor to excellent in terms of quality) and implemented a baiting campaign covering more than 600,000 ha. The Fox Free Taskforce and the Tasmanian Government, however, have always been in a difficult position with regard to fox eradication, as foxes found and destroyed in Tasmania mean that the community could judge the Taskforce as having failed to keep the State free of foxes. In contrast, a successful control program and the lack of any clear evidence of foxes (dead or alive) could be judged as a costly effort carried out for no clear benefit." Several months after this report was released, in a social climate where significant numbers of Tasmanians still did not believe that foxes existed in the State, a fox was reported as having been run over on a country road (Cleveland 2006; DPIPWE website).

The eradication effort has had an unprecedented amount of public scrutiny, in part reflecting public unease. Since early reviews (Bloomfield 2001; Kinnear 2002; Saunders *et al.* 2006), the Taskforce's independent Technical Advisory Panel requested advice on eradication from Landcare New Zealand, arguably the world experts (Parkes and Anderson 2009) and a Public Accounts Committee (of the Tasmanian State government) inquiry into efficacy of the eradication continues. Suffice to say all completed reviews reiterate that foxes are present and eradication must be attempted.

The Invasive Animals Cooperative Research Centre (IA-CRC) was founded in 2005 with a mandate to counteract the impact of invasive animals in Australia through the development and application

of new technologies, and by integrating approaches to management across agencies and jurisdictions. Some 43 Australian and non-Australian organisations are members of the IA-CRC, including the Fox Eradication Branch of DPIPWE. The opportunity to eradicate a devastating potential predator before it became established was an important consideration for the IA-CRC. It was also recognised that any decision to attempt eradication would depend to a significant degree on public opinion and support. As part of its program, the IA-CRC commissioned a survey in July 2006 with the purpose of ascertaining the views of the Tasmanian community about foxes, their presence in Tasmania and what, if anything, should be done about them. The intent was to gain a better understanding of the social context into which measures for the control and/or extermination of foxes – including novel technologies – might subsequently be introduced, and to develop the basis for a dialogue with the community about this. This paper presents a summary of the findings, and identifies issues worthy of further exploration.

Objectives of study

The survey was designed to elicit the perceptions of the Tasmanian community about the following issues:

1. Whether there are, or have been, foxes in Tasmania, and if so, how they got there, and where they are.
2. The implications of an established fox presence, either detrimental or beneficial.
3. The importance of foxes becoming established in Tasmania as an environmental issue, relative to other environmental issues.
4. Possible methods of control, their acceptability, who should be responsible, and the urgency of acting.
5. Sources of information about environmental issues.
6. Awareness of the existence and activities of the Fox Free Task Force.
7. Whether Tasmania should be kept fox-free.

Conceptual context

The conceptual context in which this work was carried out is in the field of dialogue between science and society and participatory democracy. Following the UK House of Lords Report (Anon 2007) various authors have commented on the decline in trust between society and science in recent years, on the need to engage the community more closely in scientific decisions involving its future and on requiring its approval or co-operation. In introducing a book on the ‘public value’ of Science (Wilsdon *et al.* 2005), Wilsdon noted that:

“... The scientific community once believed it could assuage public concerns over the misuse of science by better communication of the benefits of scientific knowledge. There has been a gradual, sometimes grudging, recognition that mere communication – whilst important - cannot alleviate justifiable anxieties. Now the watchword is ‘engagement’ and with it, ‘dialogue’. The scientific community is beginning to realise, but often

reluctantly accept, that we scientists need to take greater notice of public concerns, and relate and react to them.”

The public debate in fields such as genetically modified food, nuclear power, stem cell science, xenotransplantation, cloning, food irradiation, water recycling, climate change, nanotechnology *etc.* where technologies have been challenged, stalled or rejected by the public highlights the importance of an informed and engaged community to the adoption of new science and technology, especially in those areas requiring public decision or participation. The failure of dialogue sometimes leads to technology rejection – illustrated by long-standing moratoria on the growing of GM food in Australia in several States, the nation’s long refusal to implement nuclear power and the rejection by the City of Toowoomba of water recycling in a plebiscite.

In the environmental field, community sanction is often required for new conservation measures to be put in place and, on occasion, for direct community participation, activity or behavioural change to occur. To achieve this modern science communication theory favours establishing a dialogue, the first step in which is to ascertain the current extent of community knowledge, belief and opinion on the topic and its likely response to various optional courses of action.

This study was designed as a baseline survey to establish the community’s views on the fox issue in Tasmania and the likely level of community support or opposition to various options for eradicating this pest animal, as a prelude to a dialogue process leading to adoption of the most effective and acceptable eradication method/s.

Development and conduct of survey

Introduction

There is no canonical way of conducting surveys of the community, whether viewed in terms of (a) survey structure, (b) selection of sampling frame and approach, (c) content or (d) approach to analysis and presentation of results. This is an immediate consequence of the simple fact that there are many reasons why one might wish to carry out such surveys. Thus a Web search reveals a very wide range of approaches to each of these perspectives. Consequently, the approach outlined below is not dictated by some form of specific ‘best practice’ in community surveys, but rather follows from basic principles of good surveying, such as clarifying the purpose of the study, defining the target population, selecting a sample size consistent with budgetary constraints, careful wording of requests for responses, appropriate use of statistical methods and statistical graphics, and clear identification of limitations in the conduct of the survey.

It is interesting to contrast this sort of general survey that seeks to glean somewhat diffuse intelligence with the highly structured approach described in Fisher *et al.* (2008), where it is essential to quantify the community’s overall view about a general proposal in order to provide a link with likely community support for a significant business decision. The latter situation is more likely to lead, eventually, to one or two ‘approved’ ways of assessing community perceptions.

Outline of approach

The survey questions were developed in two stages. An initial focus group was conducted with people who had expert knowledge about the evidence for the existence of foxes in Tasmania. This material was used to inform the conduct of two focus groups in Tasmania in late April 2006. The first was held in Launceston and the second in Cressy, a farming community in the Central Midlands area, with about 10 people in each group representing a cross-section of the local community. The material from these two groups was used to develop the survey questions. The survey instrument was also designed to capture demographic information on *Gender, Age, Educational level, Occupation, Location, and Length of time resident in Tasmania*. Collection of survey data was delayed until the release of the IA-CRC report by Saunders *et al.* (2006) and associated media activities. Surveying was conducted in July 2006.

Surveying the Tasmanian community

The four principal ways of carrying out community surveys are face-to-face interviews, telephone polls, mail surveys and surveys based on so-called 'internet panels' (ignoring popular instant polling methods such as phone-in responses to a radio or television program). Details about internet panels and some comparative remarks about these four methods are given in the Appendix. Considerations based on precision of response, unit cost of response, and quality of sampling process meant that the only feasible means of conducting the survey was to use Web-based surveys and Internet Panels.

Responses from the focus groups pointed to the need for special emphasis on sampling the views of farmers and graziers. Two strategies were employed to do this.

1. Firstly, the Tasmanian Farmers and Graziers Association (TFGA) were contacted, and they kindly assented to distributing an invitation to participate in the poll to the approximately 500 TFGA members who use email. Despite the request and a follow-up reminder, only nine responses were elicited.
2. Secondly, the internet panel was screened for farmers. As noted in the Appendix, rural Australians are under-represented in the Internet Panel and there were, in fact, only about 40 panellists listed as farmers. All 40 were invited to participate, of whom 31 responded. So, with the TFGA responses, there were 40 responses in total from farmers.

For the rest of the community, a sample of 500 was commissioned (a number dictated by cost considerations) and 506 responses obtained. A breakdown of the responses in terms of the demographic variables is provided in Table 1. Whilst the distributions according to the demographic variables cannot be claimed to bear a strong relationship to population distributions, there are sufficient numbers of respondents in each of a number of key categories (*e.g. Age, Gender, Education Level, Location*) for some statistical analysis to be performed.

Thus, there are potentially significant biases in the results, so that findings must be treated with some caution. In particular, it would have been highly desirable to have included more people from the rural (especially farming community) in the survey but, as noted above, these people appear reluctant to participate in surveys, even those seemingly aimed at improving their circumstances. Nevertheless, this survey does identify some interesting and, to some extent, possibly counter-intuitive conclusions that are worthy of further research.

Table 1. Distribution of respondents according to demographic variables (except Postcode).

Age		Gender		Education level	
Under 25	124	Female	355	No formal education	4
25 to 50	341	Male	191	Primary school	1
Over 50	81			High school	188
				College (TAFE) private	59
				College (TAFE) tertiary	128
				University	166
Occupation			Location		
Unclassified or no current occupation			152	City	287
Farm labourer			62	Regional centre	128
Unskilled (except farm workers)			3	Rural area	131
Semi skilled			18		
Farmer			9		
Skilled manual worker			32	Length of time in Tasmania	
Clerk / Typist			50	Always lived here	312
Sales person			41	Have lived elsewhere in Aust.	193
Semi professional			69	Have lived overseas	41
Owner of a small business			49		
Manager, large business			9		
Professional			91		
Owner of a small business			49		

Analysis of quantitative responses

The results will be reported against each of the seven key issues described earlier. In some situations, the evidence of a 'statistically significant difference' is overwhelming simply from a graphical display, so no formal assessment has been described.

1. Are there, or have been, foxes in Tasmania, and if so, how did they get there, and where are they?

Following the discovery of the road-kill fox in early August 2006, this point might appear moot. However our research has confirmed that suspicions existed in some quarters of the community about the veracity of the road-kill claim which they regard as part of an attempt to manipulate public opinion.

Overall (prior to the discovery of the road-kill), some 75% of respondents believed that foxes have been present in Tasmania at some point, compared with 8% who didn't. The demographic variables had negligible impact (Chi-squared tests, $P > 0.1$ in each case) except that people who had moved to Tasmania contained a slightly higher proportion of 'Don't knows' ($\chi^2 = 14.3$ on 4 degrees of freedom, $P < 0.01$).

Fig. 1 shows that opinion is overwhelmingly of the view that foxes were introduced either accidentally or illegally to Tasmania, and Fig. 2 shows that people believe that foxes are wide-spread in Tasmania.

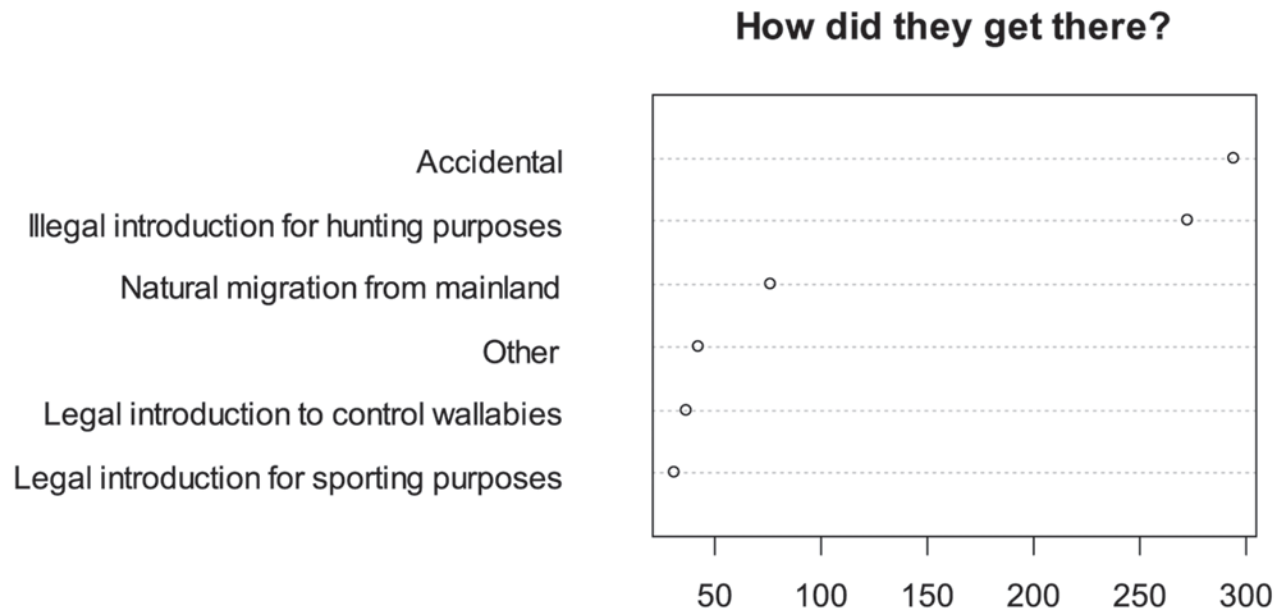


Figure 1. Dot chart showing the principal reasons given by respondents for foxes being in Tasmania, if, in fact, they had been in Tasmania at some point.

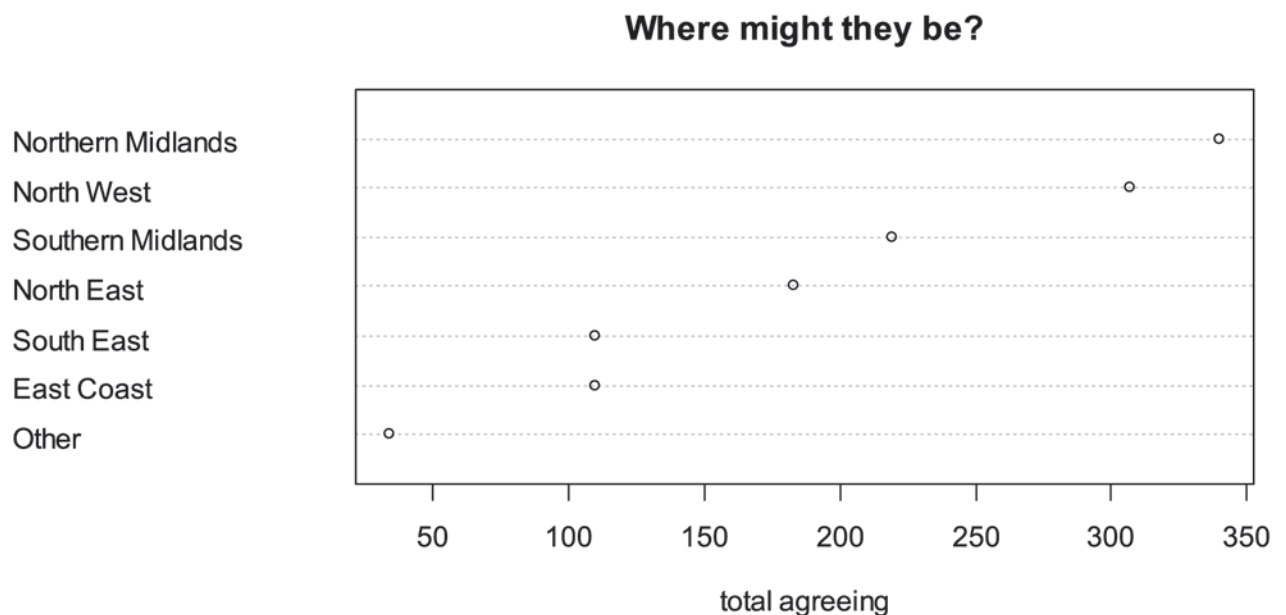


Figure 2. Dot chart showing whereabouts in Tasmania respondents believed foxes to be present .

2. The implications of an established presence, either detrimental or beneficial

From Fig. 3, it is evident that people see a wide range of problems associated with the presence of foxes, with the *Threat to wildlife* being the most recognised problem, followed by *Impact on farming* (Fig. 3). A smaller number of respondents on the other hand, are also prepared to recognise potential benefits (Fig. 4) when invited to do so (the question was not compulsory), with *Control of introduced animals* and *Hunting* being nominated most commonly.

3. The importance of foxes becoming established in Tasmania as an environmental issue, relative to other environmental issues

People were asked to rate the level of concern on a 10-point scale, where 1 = *Totally unconcerned* and 10 = *Very concerned*. The overall distribution of ratings is shown in Fig. 5, indicating that a large number of respondents regard this as an issue of great concern. Here, there are some interesting differences on a couple of demographic variables. Fig. 6 indicates that the level of concern increases with age ($X^2 = 41.6$ on 18 degrees

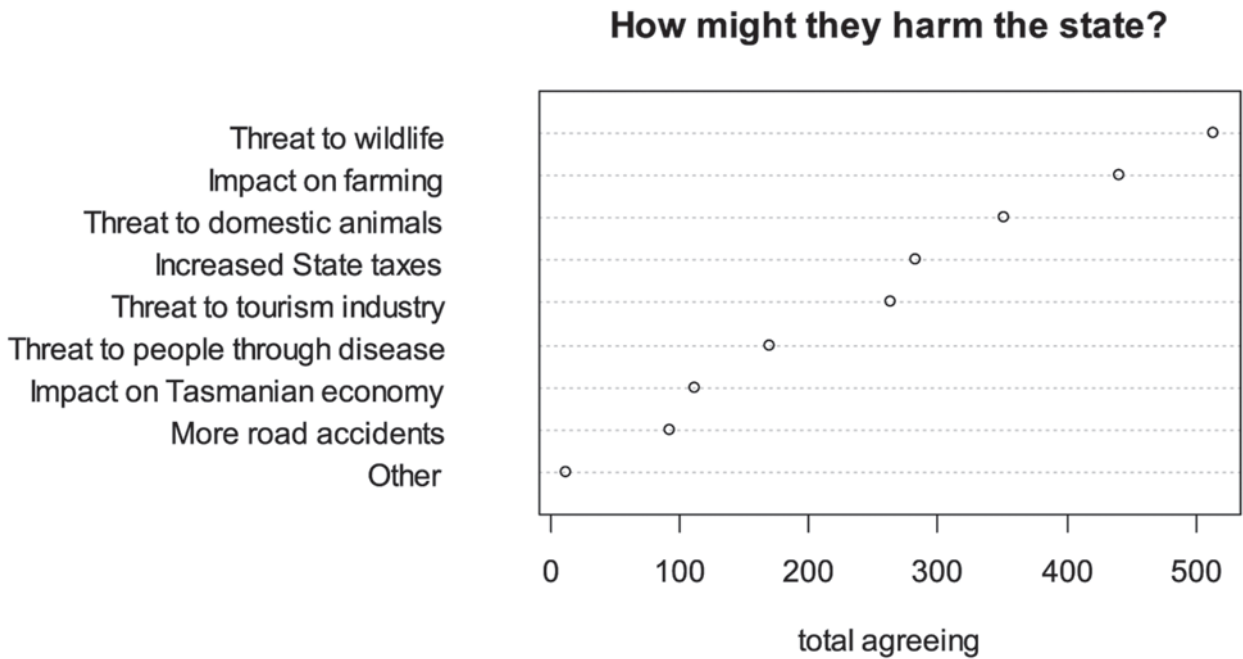


Figure 3. Dot chart showing respondents' views about the threat posed by foxes.

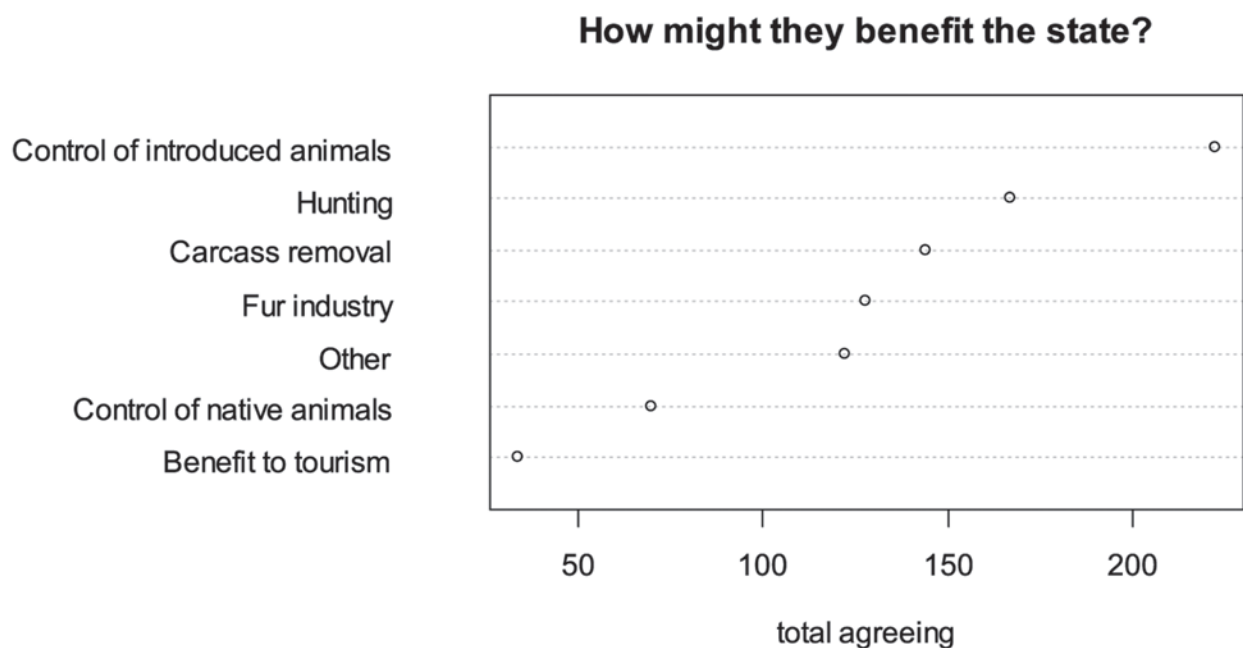


Figure 4. Dot chart showing respondents' views about possible benefits of having foxes in Tasmania.

Question 5: How concerned are you foxes might become established?

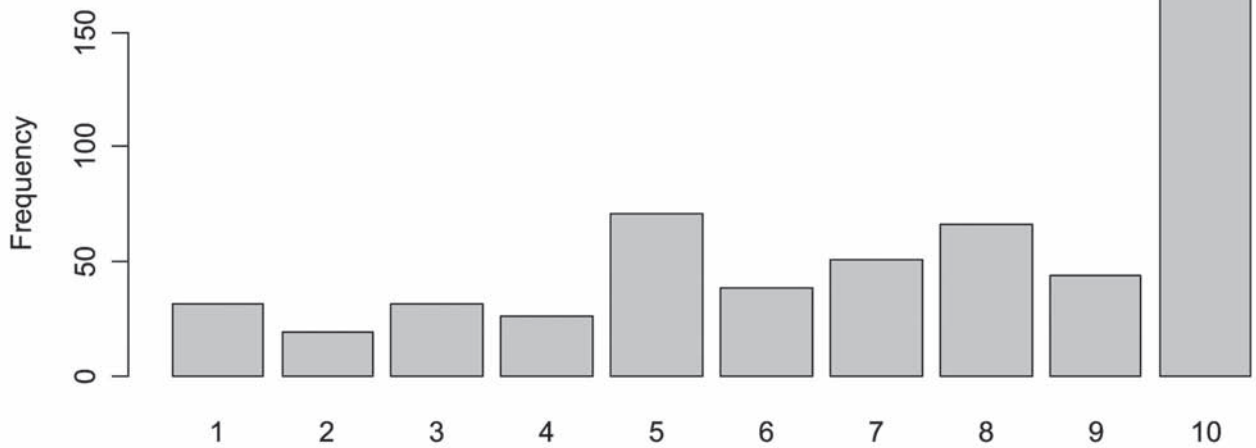


Figure 5. Histogram of responses about people's level of concern with respect to foxes becoming established in Tasmania. Rating of concern was on a 10-point scale, where 1 = Unconcerned and 10 = Very concerned.

How concerned are you that foxes might become established?

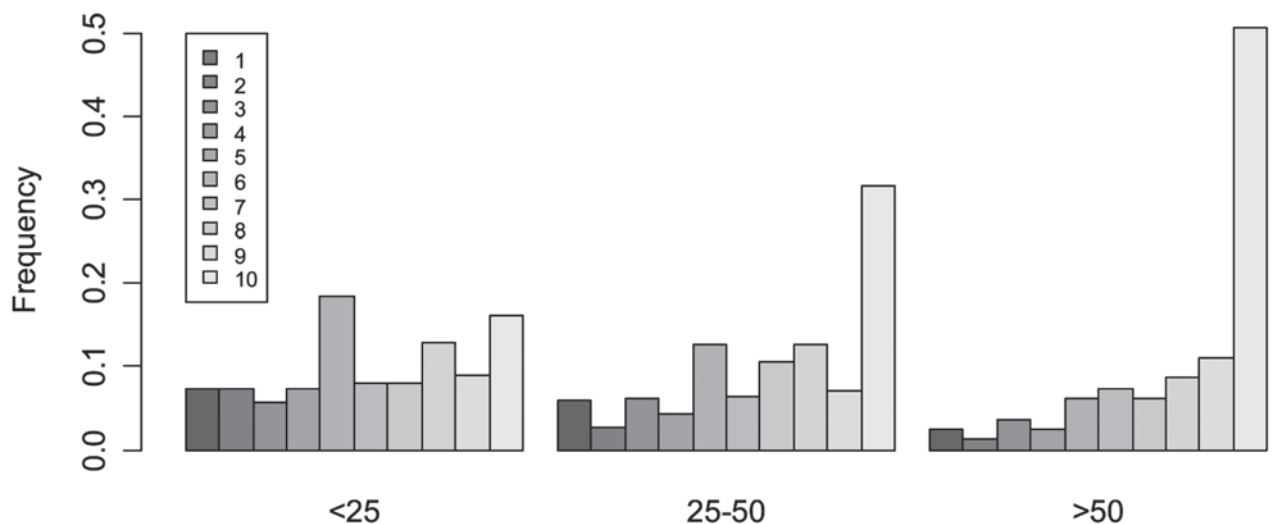


Figure 6. Histogram of responses about people's level of concern with respect to foxes becoming established in Tasmania, looked at by age. The level of concern increases with age.

of freedom, $P = 0.001$), and Fig. 7 that it increases somewhat with level of education ($X^2 = 64.8$ on 45 degrees of freedom, $P = 0.03$). These two observations need to be qualified by the uncertainty attaching to the set of respondents in terms of being representative of the population (although, since older people are likely to be under-represented in the sample, this is all the more striking), but they do suggest questions worthy of further exploration if some form of community consultation program is contemplated.

Fig. 8 provides a picture of the relative importance to the respondents of a variety of environmental issues, ordered according to decreasing mean rating. Among these issues, Foxes rate as the fourth most important – below *Overfishing* but above *Air pollution*. (There are differences between the 12 issues: Hotelling $T^2 = 45.6$, on 11 and 535 degrees of freedom, $P < 0.001$).

4. Possible methods of control, their acceptability, who should be responsible, and the urgency of acting

It is clear from Fig. 9 that people see it both as a responsibility of State Government, and of *all Tasmanian residents*, whether individually or through particular groups or roles. Fig. 10 suggests that most of the commonly applied forms of control — various forms of *Baiting*, and *Educational programs* — are acceptable. What is clearly unacceptable is 'biological control'. Whether this is due to 'fear of the unknown' or simply to ignorance as to what the term means is a matter for further study.

Concerning the matter of the urgency of taking action, Fig. 11 carries the same message encountered earlier: not only is there a clearly perceived need for action if foxes are indeed present but, as observed in response to the request (Issue 3) about foxes as an environmental

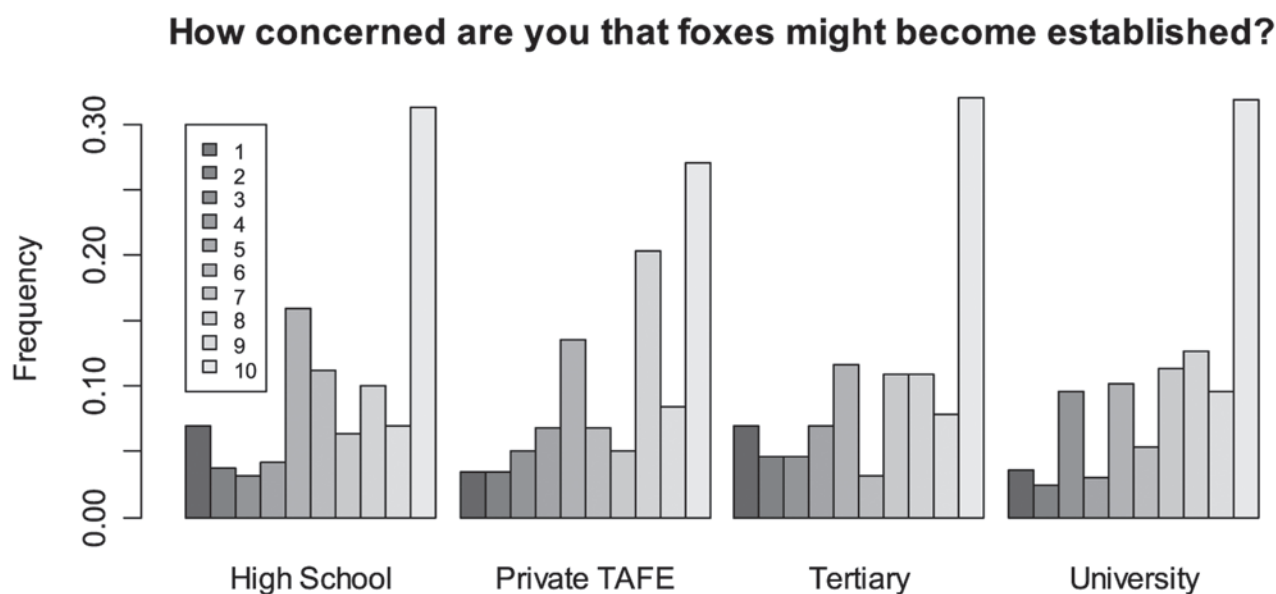


Figure 7. Histogram of responses about people's level of concern with respect to foxes becoming established in Tasmania, looked at by highest educational level attained. The level of concern increases with educational level.

issue, older people are significantly more concerned with the matter ($\chi^2 = 56.1$ on 18 degrees of freedom, $P < 0.001$) than younger people (again with the sampling caveats). (There was no strong evidence of differential effects for the other demographic variables, $P > 0.1$ in each case.)

5. Sources of information about environmental issues

Fig. 12 reveals that the dominant sources of information for Tasmanians are traditional media (*television, newspapers and magazines and radio*), and the *Internet*.

6. Awareness of the existence and activities of the Fox Free Task Force

As noted in the Introduction, the Task Force was established in 2002. It is of interest to know the public's view of its activities. A high percentage (nearly 80%) of those surveyed were aware of its existence, with awareness significantly more widespread amongst males (86%) than females (76%; $\chi^2 = 6.7$ on 1 degrees of freedom, $P < 0.01$). Fig. 13 indicates strong support for the Task Force continuing its work with an expanded role.

7. Overall, Tasmania should be fox-free?

The 'wrap-up' question in the survey related to the core issue: did the Tasmanian community want the State kept fox-free. As can be seen in Fig. 14, the answer is a resounding 'Yes': consistent with earlier analysis, there is a pronounced increase in support, with Age ($\chi^2 = 13.4$ on 4 degrees of freedom, $P < 0.01$).

Discussion and conclusions

Comments on survey design and statistical analysis

The main limitation of this study is that the farming community in Tasmania is under-represented in the totality of survey responses, with only 40 responses from

approximately 540 farmers contacted. However, it is not clear what approach to soliciting their participation might have elicited more data, as informal advice from other sources indicates that the farming community tend not to participate in surveys. Otherwise, where there are statistically significant differences between groups on specific issues, the differences tend to be quite marked.

Synthesizing the quantitative results with the qualitative data

At several points in the survey, respondents were invited to provide comment about why they had assigned the scores they did. These comments are aids to interpreting the basic conclusions from the statistical analysis.

This study indicates that the issue of foxes in Tasmania and the need to control them attracts a high level of public interest, support and some controversy. Even those who are sceptical about the presence of foxes are firmly of a view that, if their presence were confirmed to their satisfaction, the pest would need to be controlled.

The strong consensus of both the non-farming public and farmers is that whatever the means foxes got into Tasmania, it was either accidental or illegal — a prank, stupidity or deliberate vandalism being popular theories. The element of a deliberate, vandalistic or criminal introduction of an environmental pest is significant to any future communication strategy for fox eradication, as it carries overtones of public disapproval towards similarly deliberate acts of pollution, malicious damage or defacement. The following comments are typical:

- Malicious or foolish intentional importation of foxes for either keeping as a pet or deliberate release to create controversy.
- Maybe some idiot thought it would be ok to bring one to Tassie and it got away.

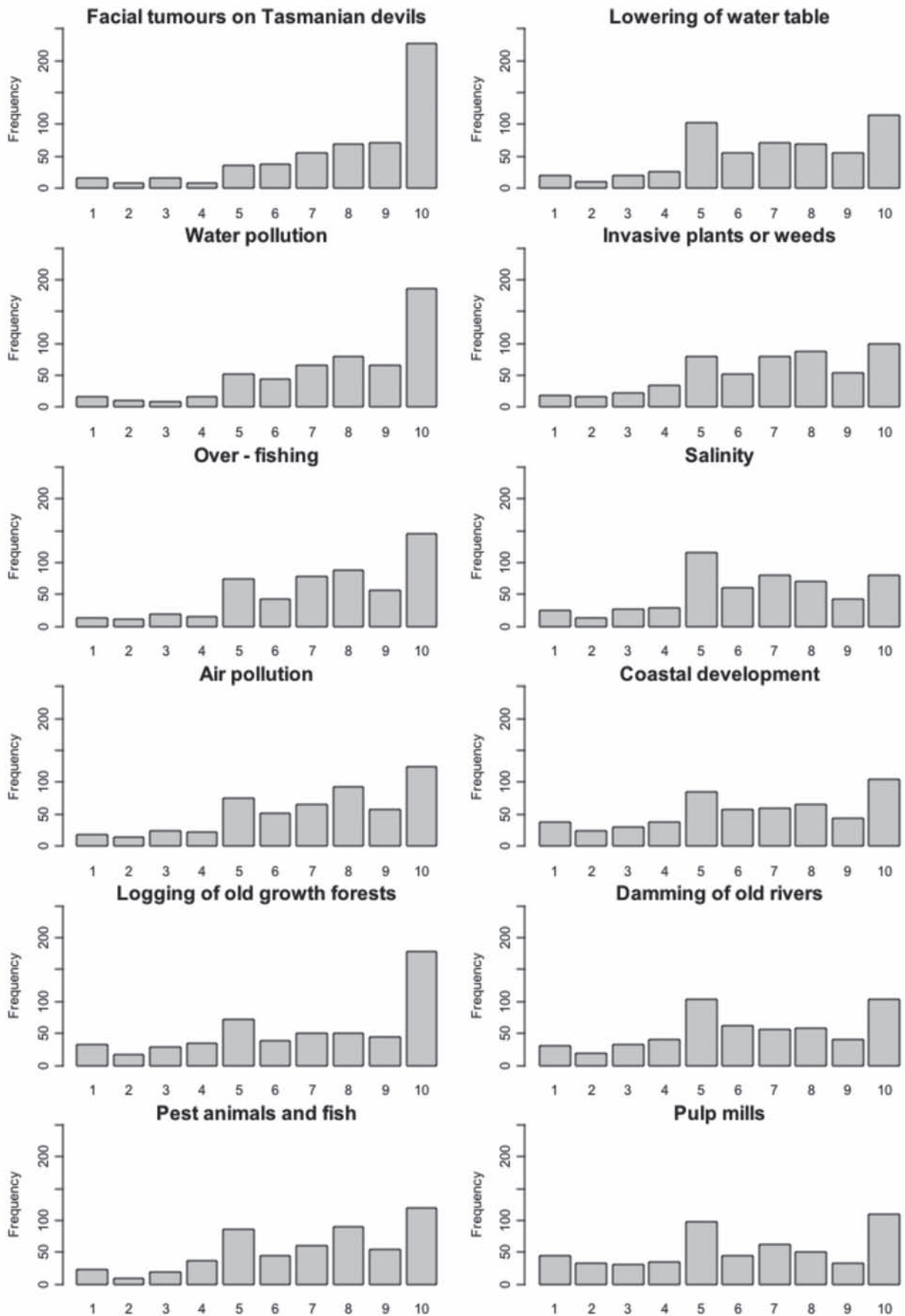


Figure 8. Histogram of responses about people's level of concern with other environmental issues, arranged in decreasing level of concern (reading down the first column, then the second). Figure 5, relating to concern about foxes, ranks fourth in importance, above Air Pollution but below Over-fishing.

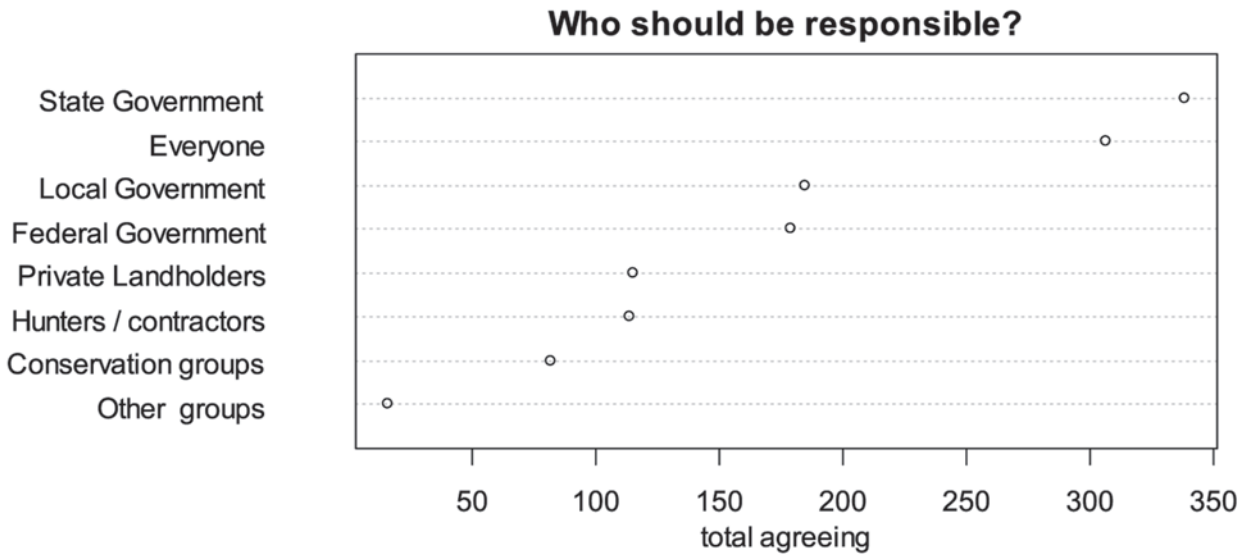


Figure 9. Respondents' views about how should take responsibility for addressing the problem of foxes in Tasmania.

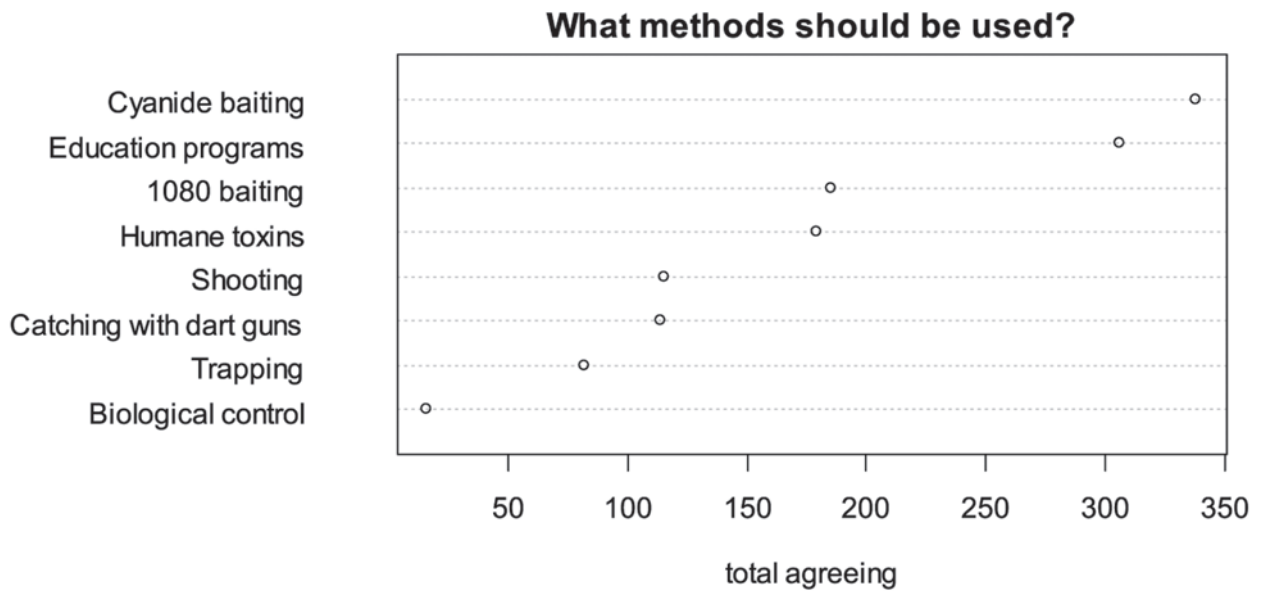


Figure 10. Respondents' views about appropriate methods for controlling foxes in Tasmania.

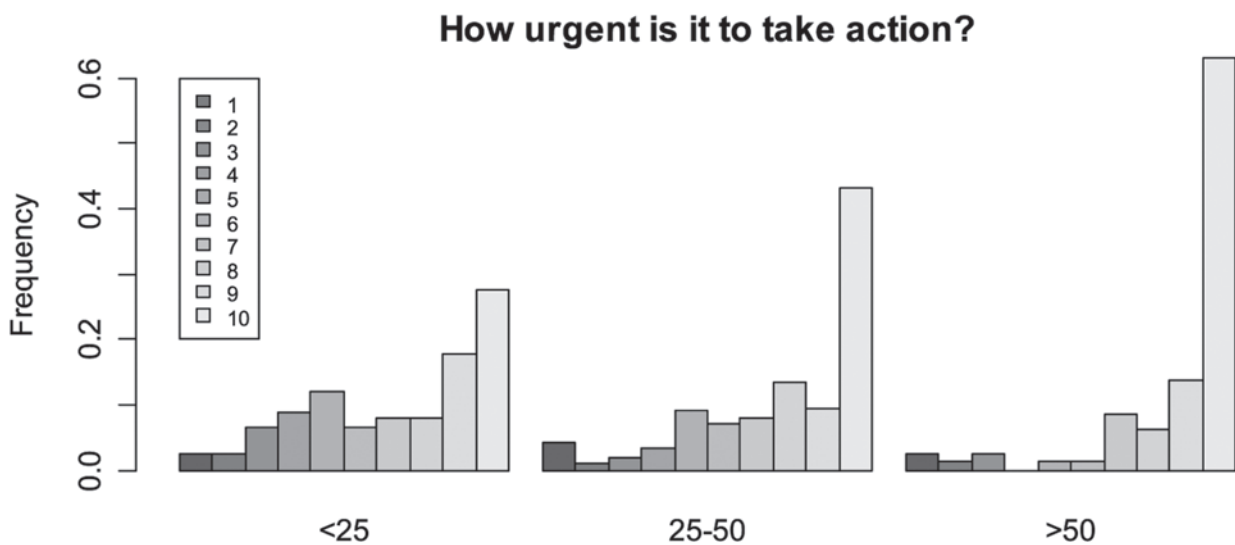


Figure 11. Respondents' views about the urgency of the need for action to control foxes in Tasmania. As in Figure 6, on the level of concern, perceived urgency increases with age of respondent.

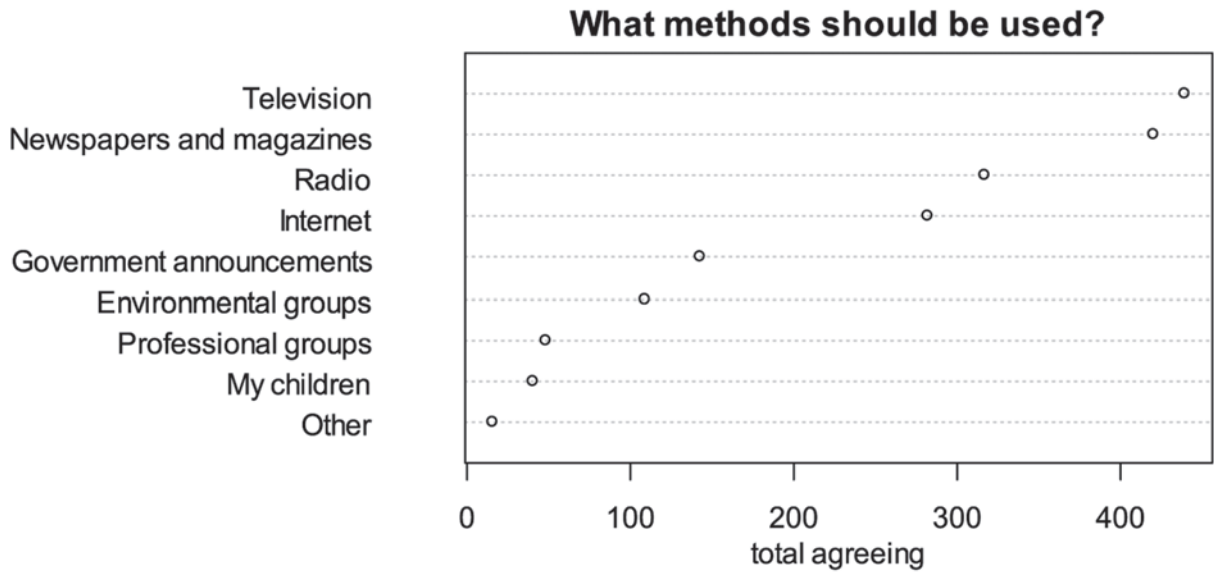


Figure 12. Dot chart showing how respondents generally receive information about environmental issues.

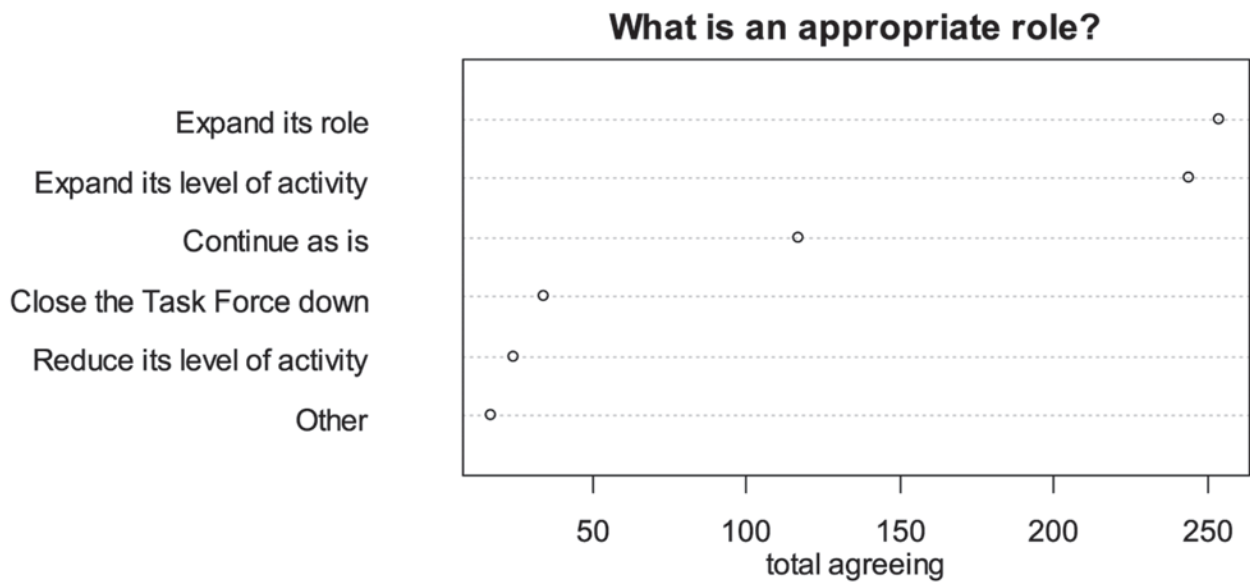


Figure 13. Dot chart showing respondents' views about the future role of the Fox Free Task Force.

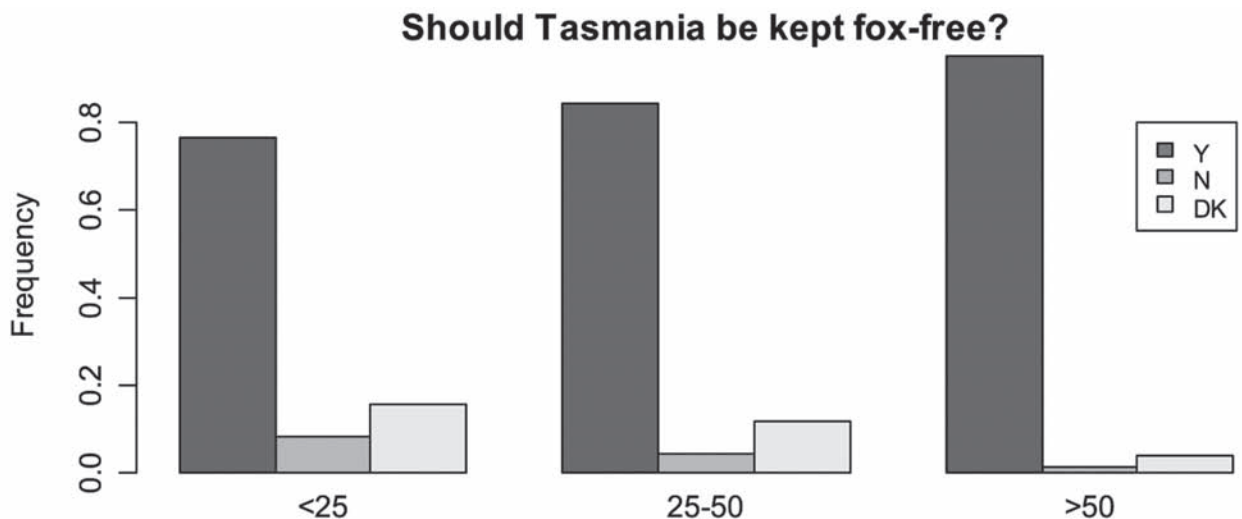


Figure 14. Respondents' overall views about keeping Tasmania fox-free, with support again increasing with age.

The indignation revealed in public comments highlights that fox biosecurity may be an even more important issue with the public than hitherto thought. In this survey, foxes emerged as the fourth most important environmental problem. Comments suggest that the public is likely to take a great interest in any eradication campaign, and to question and debate its approach and methods vigorously. The survey also indicates there is an opportunity to secure and build support for fox eradication through a well-planned policy of dialogue and public engagement on the principles of participatory democracy now emerging in advanced countries worldwide

Most people saw no benefit whatever in foxes being present in the State, a view which tends to support an active eradication program.

- They do not and will not benefit Tasmania. They are fine animals, but not here. Any imagined benefits are either short-sighted, or can be achieved by better means.

While a few respondents doubted foxes would cause much harm if left alone and some felt they might help to control other pest organisms, most were concerned they represent a significant threat to native wildlife, farming and domestic animals, a view strongly shared with farmers.

- As Tasmania is an isolated ecosystem, once an introduced animal becomes established there isn't anywhere else for it to migrate to, so eventually it will reproduce to a point where it will push other native species out of their habitats or other species may become endangered.
- I love our wildlife and would hate to see it diminish due to the fact of having these pests running wild in Tasmania
- Tasmania's flora and fauna are very precious, and to see any of it ruined by introduced animals is heartbreaking

Sceptical members of the public, including those in the farming community, may demand high standards of proof for the existence of foxes. In focus research, some made it clear this would only be in the form of witnessing by an individual they trust.

- I don't think the evidence (for the presence of foxes) that has been presented so far is incontrovertible. It seems a bit like the evidence for the thylacine. Show me a video of one running around and I will be more convinced.

Some members of the public were concerned that attempts to eradicate foxes might also affect native wildlife. This concern needs to be addressed in any control strategy and communication plan.

- The stupidity of the situation is that more Tasmanian devils will die due to poisoning than foxes will.

Many people felt that fox eradication is a State government responsibility, while others felt it should be shared with landholders and the wider community. Some focus group respondents were of the view that the public, especially school children, could play a helpful role as 'fox spotters' provided good information is widely disseminated about the fox and its habits. This suggests there is an opportunity to further engage the general public in a campaign to eradicate foxes.

- *Should be managed by the state government but they need to engage many people including local landowners to eradicate foxes. The government will need to consider giving landowners some leeway - it is possible that this course of action may kill native wildlife, but landowner should not be penalised if they are shooting because they believe it to be a fox.*

While there was general support for baiting as an eradication method, there was also concern that any proposed methods should target the fox very precisely:

- *With baiting his should only be put in place if it can be guaranteed that it will only affect the target species and not late down the track pass on to another species.*

Some forms of baiting, notably 1080, are likely to prove controversial:

- I don't think any more poisons should be introduced to our forests. I think 1080 poison is a disgusting way to kill animals.

On the question of urgency it is clear the majority of respondents, especially older citizens, regard the fox issue as extremely urgent and are looking for further action from the authorities:

- The sooner action is taken to eradicate foxes the better. If they become established it will be harder to get rid of them.

While a few respondents questioned the efficacy of the Fox Free Task Force, the majority were of the view it should be given greater resources to deal with the problem. Some comments point to a desire for greater public communication of TF activities:

- I believe that genuine awareness of fox activity should be increased to the public. I believe that inaccurate and sensationalistic reporting by the media has damaged the credibility of the Task Force. I was aware of its existence, but not that it has existed for 4 years.

Most respondents indicated they received their environmental information from friends, from university sources or, in some cases, through their work. However respondents broadly felt that increased public awareness of the fox issue should largely occur via the media (TV, print, radio and the internet, in that order).

Public opinion among Tasmanians surveyed was overwhelmingly and vehemently opposed to the presence of foxes and indicates a high public expectation that there will be action by the authorities, scientists and others to remove them and prevent their further entry to the State. The minority of respondents who differed from this view were chiefly in the "don't know" category, requiring further information. The variation in responses by age to this and other questions indicates the desirability of a stronger communication focus on younger Tasmanians about foxes, the risks they pose and the need to use scientific methods to eradicate them.

To summarise the findings of this preliminary study:

1. There is strong interest among the Tasmanians in the fox issue and in learning more about it.
2. There is likely to be strong support for any measures taken to exclude or remove foxes from Tasmania.

3. There is promising scope to involve the community in dialogue about foxes and ways to eradicate them, and possibly to engage them in various eradication-related activities.
4. There will be significant public interest in the specificity of fox eradication measures.
5. There appears to be firm support for an increase in resources for the Fox Free Task Force. This is accompanied by a desire on the part of the community to be kept informed.
6. Future communication activity should place greater emphasis on reaching and engaging with younger age cohorts.
7. The basis exists for developing a novel tool for ongoing monitoring of public opinion on the fox issue and using it to plan future communication and dialogue activity. Indeed, the weekly national Community Awareness Survey launched by the IA-CRC in late 2007 now provides just such a vehicle.

Acknowledgements

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very helpful references in relation to Internet Panels. Dr Peter Salmon of Australian Survey Research kindly made available his research findings about the quality of Internet panels when compared with Australian Bureau of Statistics census data. We acknowledge constructive comments from the Editor, Nick Mooney and an anonymous reviewer on an earlier version of the paper.

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APPENDIX I Appendix: Use of Internet panels for community surveys

As with other sorts of survey – staff satisfaction, consumer preference, customer satisfaction – it is becoming increasingly difficult to obtain efficient and cost-effective perception data. The increasing demand for information of this type is being countered by increasing reluctance of people to provide their personal views *gratis*, or even in exchange for some form of compensation. The difficulties facing the surveyor have been increased by legislative changes aimed at protecting people against unwanted invasion of their privacy by ‘cold-call’ marketers.

The four principal ways of carrying out surveys are

- i) face-to-face interviews (area sampling)
- ii) telephone interview
- iii) mail-out surveys
- iv) Internet-based surveys.

The first three methods of these are sufficiently well-known as not to require further explanation. However, it is worth providing some information about the fourth method, using so-called ‘Internet panels’, that is becoming increasingly popular.

There are three main advantages of Internet panels: the speed of the response; the cost of response; and the fact that this method is completely anonymous for survey panellists, so therefore will generally produce more candid responses.

People are recruited to Internet panels using a variety of methods. Typically, the Internet Panel Provider has a number of different sites, each with a number of different rewards mechanisms to appeal to the varying demographics. People are recruited from these sources according to a range of demographic variables, with a view to building a panel representative of the general population. The process involves prospective members completing a set of profiling questions and a lifestyle survey when first registering. The process is also ‘double opt in’, so the user must confirm their status and details before becoming a member. There are also a number of online programs where the focus is on participation in the program being reward in itself, rather than the emphasis being on a fiscal reward, with the goal of obtaining a better quality panel.

For a given survey, email invitations are sent to panellists according to how suitably matched their demographic profile is with the requirements of the survey. This aspect of the process also has protection built in to guard against multiple responses by the same individual. In the current context, use of an internet panel was regarded as the only cost effective approach. Area sampling and face-to-face interviewing were far too costly, and mail surveys tend to have low response rates.

ESOMAR (an international organisation whose mission is to enable better research into markets, consumers and societies) have established guidelines on internet research. These are available at <http://www.esomar.org/index.php/research-using-the-internet.html>.

The methods used to obtain the panel for this survey are consistent with these guidelines, except that the research panel is recruited from a pre-established marketing database.

Some work has been done on checking the demographic characteristics of random samples from the Empowered Communications Internet Panel database, the one used for this survey. In an unpublished report on the ASR-Empowered Social Trends Survey, October 2005, Dr Peter Salmon (personal communication) made comparisons of the Empowered Communications Internet Panel population distributions with those of the Australian population that are publicly available from the Australian Bureau of Statistics’ website, www.abs.gov.au, for a number of demographic variables. The comparison used the ABS 2004 population figures. Based on the 3423 responses from the Internet Panel, we can make the following qualitative conclusions (quotes are taken from the cited source) for demographic variables relevant to the present study:

1. The age distributions are reasonably comparable. ‘The survey has over-sampled both male and females in the age range of 20 to 49 years, and under-sampled for 50 years and over. More males in the 50+ group responded than females, and in both cases, the number of people 70 and over was negligible, in proportion to the population (1.5% for the survey compared to 12.1% in the population). The under-sampling in the older age brackets is likely to reflect web usage patterns.’
2. Ratio of males to females: no discernible difference between the Internet sample and ABS population ratios.
3. The geographical distributions are not proportionately represented in the Panel. ‘The poll has not reached a representative proportion of the rural population. Access to the Internet may explain why this group was not fully represented. Many areas of rural Australia do not have adequate access to the Internet.’

APPENDIX I

As a final comment, we acknowledge that not everyone in the community can be reached by an Internet survey. The same is true of telephone surveys and, indeed, of any type of survey in which particular types of respondent either cannot or do not wish to be contacted. The best one can do is to take whatever steps one can to show that the sample is representative in terms of the particular demographic variables chosen. There is a tacit assumption that the causes of people's inaccessibility are 'orthogonal' to the purpose of the survey. In the current situation, we have no strong evidence to the contrary.