PESTSMART

Stakeholder Views on Pest Management in Australia

Paul Martin and Kylie Lingard

Australian Government
Department of Industry and Science
Business Cooperative Research Centres Programme
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une University of New England
The Australian Centre for Agriculture and Law

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Report produced by:

Paul Martin Australian Centre for Agriculture and Law
University of New England, Armidale NSW 2351
Phone (02) 67733811

Website: www.une.edu.au/aglaw

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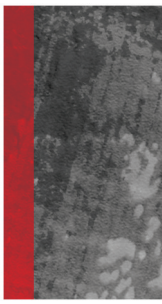

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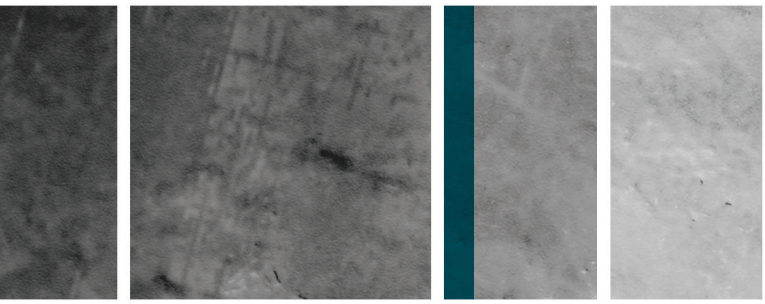


Abstract

Some animals and plants cause significant environmental, economic, social and emotional damage. This article reports on five surveys carried out across Australia from 2013-2016. The surveys sought stakeholder insights on the institutional arrangements affecting private citizen engagement in pest management. As expected, many responses noted issues with resourcing, coordination, administration, policy and demographics. Others revealed the human dimensions impacting citizen participation. These include trust, temperament, education and motivation. This empirical study contributes to the development of evidence-based reforms and presents policy makers with new insights on the challenges affecting citizen participation in pest management.

Keywords: Invasive species, invasive animals, community engagement, participation, citizen action.

1.1 Introduction

Australia is a megadiverse country, home to thousands of species found nowhere else on earth (The Wilderness Society, 2015). Australia also holds the world record for the most plant and mammal extinctions, with many unique species under threat from pests (The Wilderness Society, 2015). The *Biosecurity Act 2015* (NSW) s 15(1) defines a pest as follows:

A "pest" means a plant or animal (other than a human) that has an adverse effect on, or is suspected of having an adverse effect on, the environment, the economy or the community.

The biological nature of pests make the problem very difficult to manage. For instance, feral horses, dogs, pigs and birds spread rapidly across political and legal boundaries making it is hard to allocate responsibility for control, and control may be non-feasible. A landholder who has exercised reasonable diligence may find himself or herself with a problem Statistics, 2002).

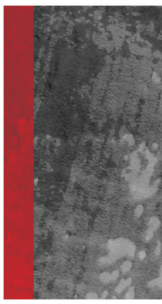
Institutional arrangements are key to citizen compliance with this duty. Unless the "rules, norms and agreements that structure human interactions" make it sufficiently attractive and feasible for citizens to take action, then citizen-focused policy settings are unreliable (Chair of Group Development Studies, 2011). This article analyses survey data on the institutional arrangements affecting private citizen engagement in pest management in Australia. The work forms part of the Invasive Animals Cooperative Research Centre (IACRC) Program 4, Facilitating Effective Community Action (IACRC, 2016).

2.1 Methods

We carried our five online surveys from 2013-2016.[1] There were 125 participants in total, the majority having more than 10 years' pest management experience (46.67%). Participants varied in each round due to organizations changing their representatives, and people's availability. Many participants identified with several roles, including:

- Working directly with communities (86.67%)
- Working with government agencies (70%)
- Responsibility for facilitating community programs (66.67%)
- Responsibility for providing technical or specialist knowledge (40%)
- Member of non-government organisations specialist knowledge (40%)
- Working in research and policy (16.67%)
- Working in the private sector (3.33%)

There was no expectation that conclusions would emerge directly from the data because of the nature of the issues and sample size. Our goal was to facilitate information flows between Program 4 researchers and people involved in pest management, and to ensure our reform proposals reflected stakeholder needs. This is consistent with our philosophy of working 'with and for' stakeholders rather than conducting research 'on'



them. Specifically, the surveys aimed to inspire dialogue on four questions:

1. Do institutional arrangements support citizen engagement in pest management?
2. What are the institutional barriers to citizen engagement?
3. What challenges are likely to arise in the future?
4. What strategies are needed to minimise these barriers and challenges?

Each survey included measurable and open-ended questions. We used thematic analysis to understand participant responses to open-ended questions, and quantitative data to inform and validate our findings. Thematic analysis "is highly inductive: themes emerge from the data that is gathered and are not imposed or predetermined by the researcher" (Braun and Clarke, 2006). Scholars agree on six key phases:

1. Collect and read data;
2. Code data;
3. Detect themes;
4. Review themes;
5. Define and name themes; and
6. Produce the report (Braun and Clarke, 2006; see also Smith and Firth, 2011).

The phases offer an iterative, systematic approach to detecting patterns in qualitative data (Braun and Clarke, 2006). We undertook the first three phases separately, with each author independently reading the data, identifying codes, coding the data and detecting themes. We each used different techniques to code the data and detect overarching themes. Our intent was to safeguard the integrity of the final analysis through a process of independent interpretation (see Welsh, 2002).

One author manually collated text extracts under code headings in a Microsoft Excel spreadsheet. After the first two surveys, the author participated in five meetings and eight workshops (198 participants in total). Workshop observations and discussions informed the design of the final three surveys. This approach echoes the reasoning of Dey (1993) that, "The issue is not whether to use existing knowledge, but how … There is a difference between an open mind and an empty head".

The other author used NVivo to name and tag selections of text under each code. NVivo tools can also help improve accuracy of qualitative studies (Braun and Clarke, 2006). NVivo aids applied in this study include word counts, cluster analysis and word frequency visualizations. The author removed survey questions from the data before running each query. The results helped validate initial themes, expose new themes, reveal connections between themes and unravel the story being told by participants as a whole. Prior to undertaking the thematic analysis, the author was involved in two workshops. These helped develop the author's sensitivity to some key issues before analysis commenced.

After a period of independent analysis, we came together to name and define the final themes. This involved the re-reading of survey data and correlation of independently identified themes. Statistical analysis of quantitative data and NVivo tools assisted this process. While this article presents themes identified in survey responses, the exposure of both authors to additional consultations allowed the analysis to go beyond the mere presentation of themes to a deeper exploration of issues (see Aslin, et al., 2013 for an illustration of a similar iterative approach).

We are keenly aware of the limitations and assumptions underlying this article. First, we assume that pests are a problem that landowners and managers want to avoid. Second, we accept that qualitative analysis is influenced by the researcher. We hope our mixed-method approach minimises this impact, but acknowledge the influence of our biases, values, beliefs and judgments on the analysis. Third, while every effort was made to collect a range of stakeholder views, not all perspectives were captured. We recognize the limitations of the sample size, and as such avoid making generalizations and conclusions. Fourth, the

Survey 1: June 2013; (16 participants); Survey 2: July 2013 (15 participants); Survey 3: July 2015 (35 participants); Survey 4: August 2015 (29 participants); Survey 5: April 2016 (30 participants).

surveys and our analysis are limited to institutional arrangements. Other important areas where better arrangements may be necessary, such as scientific research, are not the focus of this article.

3.1 Results

Participants in Survey 3 (2015) ranked the effectiveness of current institutional arrangements and strength of institutional support for private citizen action. Overall ratings on the effectiveness of current institutional arrangements suggest a level of alarm (Figure 1). This is captured in the view of one respondent that “we are currently fighting a losing battle on all fronts”. Around 25% noted specific unease with the fairness of resource allocations. The overall score on the strength of support for citizen action in pest management was 3.88/10 (Figure 2). Not surprisingly, performance was considered most problematic where the work was less within the direct control of the individual landholder.

The most recent survey in April 2016 asked participants to rate their agreement with certain statements (Table 1), and assess the significance, likelihood and timing of certain events (Table 2). The statements and events were based on our reflections of earlier survey responses, and observations and discussions. Overall, participants agreed it is possible for government programs to generate sustained community action but the potential is limited by imminent reductions in government funds and human resources. There was also strong agreement on the proposition that citizens are disenchanted with government community engagement strategies, and that it is increasingly difficult to engage communities in collective action. Although there was strong support for the need to enforce legal obligations, more than half the participants agreed that communities do not have the knowledge or human resources to meet these obligations. There was also general agreement that government relies too heavily on community capacity rather than taking action itself. In relation to future trends, participants noted a likely increase in the use of information technology in place of direct communities, increasing expectations for scientists to engage directly with communities, and more political confrontations.

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Figure 1: Effectiveness of current institutional arrangements (average)

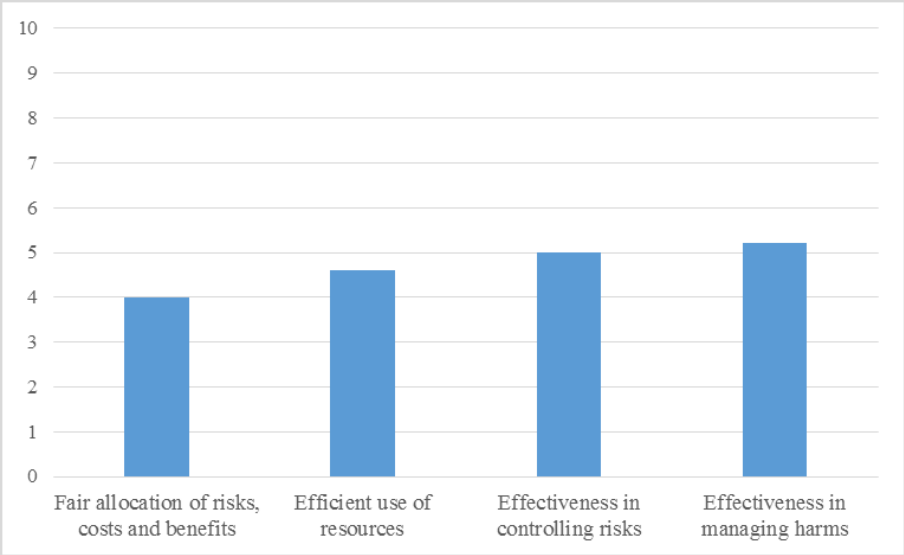
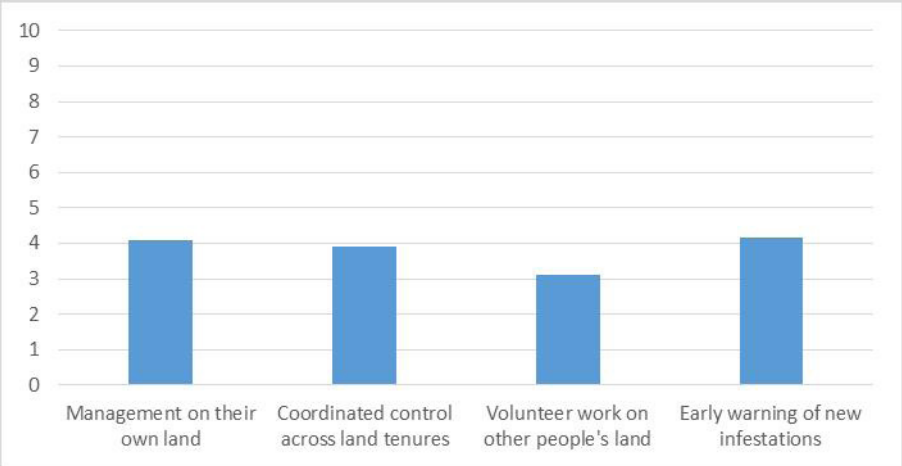


Figure 2: Strength of support for citizen action



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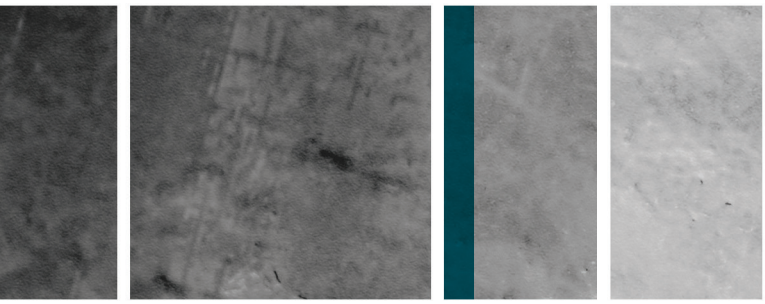
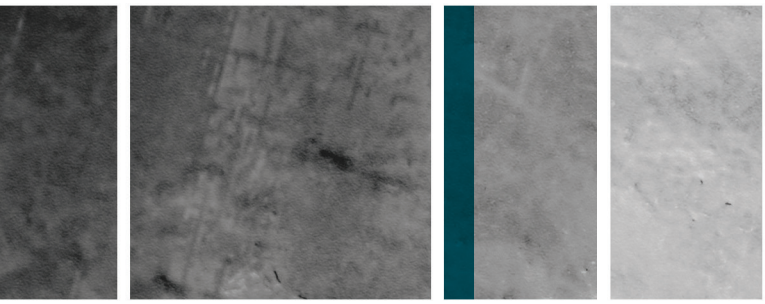


Table 1: Quantitative data in response to opinion statements

Statement	Strongly agree	Agree	Neither	Disagree	Strongly Disagree
Existing strategies focus too much on community (rather than government) leadership	3.33%	40.00%	26.67%	23.33%	6.67%
It is possible for government programs to generate sustained community action	13.33%	70.00%	10.00%	3.33%	3.33%
Existing strategies generally are effective in harnessing community knowledge	0.00%	30.00%	33.33%	30.00%	6.67%
Government programs often disempower local communities	3.33%	40.00%	23.33%	33.33%	0.00%
Government relies too heavily upon community capacity rather than taking action itself	6.67%	50.00%	20.00%	20.00%	3.33%
Stronger implementation of legal obligations would strengthen community action on environmental issues	26.67%	46.67%	10.00%	16.67%	0.00%
Scientists and experts are generally ineffective in enabling and supporting community engagement	6.67%	40.00%	16.67%	33.33%	3.33%
Community education and capacity building programs are generally effective	6.67%	56.67%	23.33%	13.33%	0.00%
Community groups are generally disenchanted with government community engagement strategies	6.67%	73.33%	13.33%	6.67%	0.00%
Communities do not have the knowledge human resources needed to address specific key issues	13.79%	41.38%	17.24%	17.24%	10.34%
It is becoming increasingly difficult to engage communities in collective actions	13.33%	56.67%	20.00%	10.00%	0.00%

Table 2: Quantitative data in response to perspective statements

Statement	Significance	Likelihood	Timing						
	Very significant	Mod. significant	Not significant	Likely	Possible	Unlikely	Within 5 years	5-10 years	10 years +
Access to government funds will decline markedly	73.33%	26.67%	0.00%	70.00%	26.67%	3.33%	86.67%	13.33%	0.00%
Communities will become more locally engaged	66.67%	30.00%	3.33%	43.33%	43.33%	13.33%	80.00%	20.00%	0.00%
Scientists will be expected to engage more with communities	16.67%	60.00%	23.33%	30.00%	36.67%	33.33%	53.33%	43.33%	3.33%
There will be more political confrontations	30.00%	53.33%	16.67%	56.67%	36.67%	6.67%	80.00%	16.67%	3.33%
Human resources and money will be in shorter supply	86.67%	13.33%	0.00%	80.00%	20.00%	0.00%	70.00%	23.33%	6.67%
Information technology will replace direct communications	53.33%	40.00%	6.67%	43.33%	30.00%	26.67%	53.33%	36.67%	10.00%



Qualitative analysis of open-ended responses helped extrapolate these findings, with NVivo cluster analysis grouping the following keywords:

Table 3: Keyword cluster analysis

Coordination	Institutional	Resources	Agencies
landscape-scale	investment	allocation	facilitators
demographics	policy	politics	assistance
	priority	commitment	local
	allocation	volunteers	
Law	**Communications**	**Landholders**	**Community**
accountability	awareness	motivation	leaders
compliance	funding	time	ownership
reporting	training	support	programs

These results mirror the connections identified in our independent manual analysis, and validate the settled themes.

3.1.1 Themes

A theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set (Braun and Clarke, 2006).

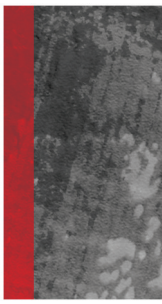
After independent coding and before meeting to discuss our findings, we each identified the themes that were thought dominated the data. Our preliminary themes were consistent, giving some confidence to the framing of final themes. The final themes were named and defined in collaboration, through a process of discussion and refinement. We agreed on seven prevalent themes:

- Difficulties in coordinating effective landscape-scale action;
- Limited government support, unfair cost-sharing and insufficient private investment;
- Inadequate investment in relationships and respect;
- Inconsistent approaches to law, policy, implementation and enforcement;
- Inadequate focus on communicating issues to public;
- Ill-defined responsibilities and ineffective accountability measures; and
- Practical realities impacting citizen, community and government capacity.

The following section explores each theme in detail.

4.1 Discussion

This section explores the seven most prevalent themes we identified in survey data. It draws on observations and discussions to more fully understand the nature of the issues raised and ideas for improvement. Many themes, issues and ideas overlap. For example, private citizen engagement in landscape-scale management is made more difficult by a lack of clarity on responsibilities and roles. We summarize the issues and ideas at the end of this section.



4.1.1 Difficulties in coordinating effective landscape-scale action

Landscape-scale action (sometimes referred to as the nil-tenure approach) requires that land managers controlling various tenures work together to address pest problems. Landscape-scale action acknowledges that pests do not respect political and legal boundaries. Our analysis revealed several institutional barriers to landscape-scale action, the most prevalent being a lack of coordination between and within different levels of government, and between landowners, communities and government agencies. As one participant opined, the "fragmented governance landscape" can confuse land managers and impede citizen action.

Other notable issues included the difficulty in coordinating land managers with different enterprises, tenures, attitudes and aspirations. Several respondents noted that control in urban and peri-urban areas is made more difficult by the low awareness of pest issues:

> *"We need more selling of understanding of the pest threat in urban areas where the public believe that they are all cuddly little animals that do no harm."*

Adding to the challenge is the difficulty of coordinating programs across vast (often sparsely populated) areas and the limits of the ability of regulators to force private property owners to carry out control measures.

Most of the coordination challenges noted in survey responses are consistent with our observations and discussion. A notable difference is the lack of attention in survey responses to the challenges of pest management on the extensive Aboriginal and Torres Strait estate (where socio-economic disadvantage is likely to limit the ability of custodians to control invasive species). Only one respondent identified this as a concern.

Ideas to improve citizen engagement in landscape-scale action

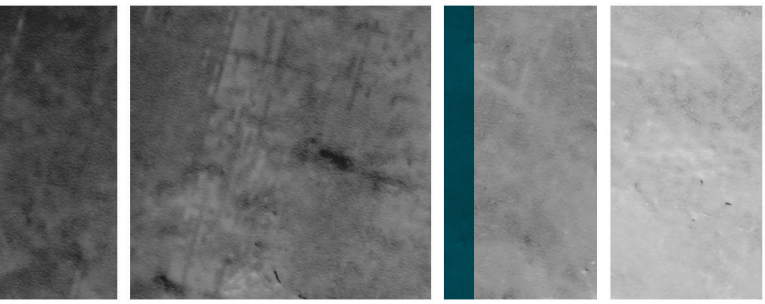
The most popular idea to improve private citizen engagement in landscape-scale programs was the coordination of laws, policies and programs across governance levels, based on an agreed definition of "what constitutes the landscape-level". There were divergent views on the best level at which to administer landscape-scale strategies, and the most appropriate agency to oversee the implementation of coordinated programs. For example, one respondent commented:

> *"There are 56 Natural Resource Management groups across the country, supported by the Federal Government. These groups are designed to operate at the landscape level. Why are these not being utilized for monitoring and reporting, funding andgovernance, knowledge transfer and co-investment?"*

The alternative view was also supported:

> *"In Western Australia, the Recognised Biosecurity Group mechanism provides for long-term financial stability for a landscape-scale coordinated approach to invasive species management, by providing funding for the specific purpose of invasive species control."*

Arguments for using specialized groups include that organizations with broad natural resource mandates may focus on other issues rather than invasive species. The counter argument concerns the value of integrated management of landholder issues. A related suggestion was for dedicated peri-urban strategies that "acknowledge the different requirements between peri-urban and rural areas". These differences include legal complexities, fragmentation of land uses and attitudes, and problems of landholder capacity and awareness.



One radical reform proposals involved dismantling "administrative boundaries" to "reduce the number of government and agency boundaries". Another recommended changing private tenure arrangements to allow access to neighboring properties for the purpose of pest control.

A persistent idea for most themes was increased citizen participation in the planning process. This reflects the logic that people who participate in the process are more likely to support the plan. Recommendations for participatory landscape-scale planning included "the negotiation of best-practice strategies" to address pests as part of broader biodiversity and production programs, rather than specific pest approaches (e.g. dog, rabbit, and camel programs). Negotiation of regional production or biodiversity plans might involve land managers, landholder groups, government agencies, local volunteer groups, local governments and Indigenous landowners. Negotiated landscape-scale strategies could include performance targets and indicators. Individuals and groups within the region might be able to use this information to inform funding applications and generate public support. As acknowledged by two participants, attention should be paid to power imbalances between parties in any such process, to ensure all groups can express their views.

4.1.2 Limited government support, unfair cost-sharing and insufficient private investment

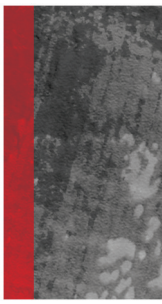
A key concern of all participants was the financial pressure facing the pest management system from the continuous decline in government funding, coupled with limits to the economic capacity of landholders. Key phrases included "budget-cutting", "shrinking funds" and "huge reductions in government resources". Although there were contrary views on each matter raised, the overall picture painted by respondents was of an unreliable and ad-hoc funding system that "does not assist long-term coordination of cross-tenure land management".

The diversity of views on how funds should be allocated reflects the competition for scarce resources between frontline staff, natural resource management bodies and community organisations, and between research and on-ground action. For example, there was some support for the view that "funding control for established species sucks resources away from new and emerging species". Other respondents called for more support for the control of established pests. There were similar differences in view on who should supply the funds; some respondents supported more public investment while others suggested greater private responsibility for control.

A particular worry on the fairness of funding arrangements was the perceived disproportionate allocation of public funds to benefit private farming, rather than public environmental concerns. As one respondent opined, "Invasive species control is very much focused on agricultural protection – the impact on wildlife is often overlooked". A related set of responses noted the emotive tactics used to secure funds for particular interests, and public funding decisions based on changing public opinions. Several participants noted that funding allocations based on subjective appeals rather than scientific evidence limit the resources available to citizens to properly manage pests.

Concerns about unfair cost-sharing between governments and citizens were often mentioned, highlighted by responses describing volunteer "burn out" and instances were people who do the right thing "heavily subsidize those who don't". On cost-shifting from government to community, one respondent noted:

> *"My main concern is that state agencies with legal responsibility are seeking to transfer significant (if not the majority) of on-ground responsibility to the community whilst retaining control over expenditure, with the potential to redirect those finances to*



non-biosecurity related government use. This clearly undermines public confidence that the approach is genuine. This gives rise to community and local government concern that this is nothing more than a cost shifting exercise with state governments maintaining control, but with minimal operational responsibilities.”

Minority concerns included the relative absence of pest issues in the requirements for private environmental market arrangements (e.g. bio banking, carbon markets and voluntary biodiversity schemes), and the efficiency with which public funds are allocated and used. For example, “A pig trap which should cost $1000 had $10,000 spent on it”.

Ideas to improve investment in private citizen action

The divergence of views on funding issues carried over to ideas for reform. For example, calls for an increase in overall funding sat alongside arguments that “sustained funding is the key word, rather than more”. Nevertheless, there was general agreement that new models were needed to fill the gap left by “huge reductions” in government funds. The following possibilities were flagged:

1. Private sector investment opportunities and incentives;
2. Crowd-funding;
3. Greater use of market instruments and links to existing programs (e.g. bio banking and carbon markets);
4. Stronger citizen incentive schemes;
5. Technology innovation/investment; and
6. Use of commercial arrangements (e.g. harvesting of pest animals, payment for skins or meat and private hunting) in pest management.

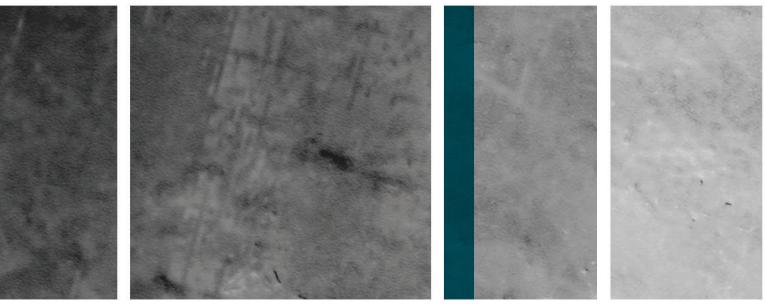
4.1.3 Inconsistent approaches to law, policy, implementation and enforcement

Most participants reported that legal inconsistencies within and between jurisdictions complicate landscape-scale coordination and the shared responsibility model. For example, “In Western Australia, feral pig meat cannot be taken for human consumption; in Queensland it can be exported”. Similarly, “Deer in Victoria are protected as game species under one Act and listed as a threatening process under another”. The variation of rules within and between jurisdictions contributes to the “inefficient use of scare resources”, “confusion” with best practice standards and legal obligations, and “fragmented, complex governance systems”. Each of these impedes citizen action.

Policy variation was also a widespread concern, with some respondents lamenting the diversity of control methods across jurisdictions based on different views about what is effective (particularly for managing the human side of the issues). While diverse legal and policy requirements may allow for flexibility and learning through experiment, respondents noted that some regions implemented control measures that were not “best-practice”. For instance:

“A number of jurisdictions have evidence-based approaches to pest management, some have a facilitation role, some use incentives and some use a compliance framework. There is no consistent application of best-practice.”

There were divergent views on the merits of compelling landholders to manage pests, and agency approaches to the enforcement of these duties. For example, one respondent noted that it was difficult for agencies to enforce the adoption of a control measure against a non-compliant citizen in the absence of a legal requirement to comply. Another offered an alternative view:



> *If we put such a high reliance on laws and coercive instruments, the battle has been lost. If private interests understand the impacts and value the effort to control, contain or prevent the spread, the need for enforcement isn't as important. If everyone turns to government and says 'enforce the laws' then it's a never-ending battle and says something about the community's level of understanding of the problem and their willingness to take responsibility.*

Several participants noted that legal duties may be difficult to implement and enforce when there is political pressure against a particular measure. Another noted the capacity of groups whose interests run counter to invasive species control to be politically effective in blocking the capacity of landholders to fulfil their duties and implement control measures. Respondents expressed particular concern over the "decreasing political influence of the rule sector", "with urban populace driving policy decisions based more on misinformed public opinion rather than best practice management and informed research outcomes". An interesting revelation was the negative effect of frequent policy changes on agency "staff morale".

Another issue with legislative measures is their inability to keep pace with change. For instance, "Current Tasmanian law limits the ability of land managers to manage fallow deer on their properties; this does not reflect the change in deer movements outside of national parks".

Ideas to remove regulatory barriers to citizen action
The data revealed tensions in ideas to improve the consistency of laws and policies and their implementation. One set of responses asserted the need for flexible rules that accommodate local aspirations; another highlighted the difficulty in balancing community aspirations with best practice standards. Still, there was general support for the "harmonization of rules, policies and strategies". For example, one participant proposed the "mandating of inter-agency cooperation in jurisdictions where various agencies are responsible across different tenures". Most participants supported a national instrument "setting rules that all individuals and organisations must work with". This might take the form of "a specific bilateral agreement between governments", administered by a "nation-wide body".

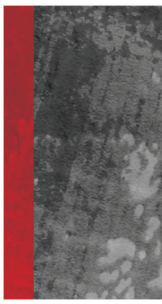
Key factors to consider in the harmonization process include the following:

- The need to "keep rules simple, to minimise the potential of discouraging land managers to take action";
- The need to agree on "expectations and objectives…at the outset";
- The need to allow for "local conditions";
- The need to allow for diverse strategies that "suit the agreed goal";
- The need to include "industry groups and representative bodies in the development of legislation"; and
- The need to include affected citizens in the whole development process.

Key benefits suggested for a harmonized approach include citizen ownership of strategies and programs, rules that mandate "best-practices" and "national systems to prevent new and emerging pests".

4.1.4 Ill-defined responsibilities and ineffective accountability measures

Federal and state government agencies are withdrawing from pest control, and renegotiating the relationship between federal, state, regional and (potentially) local arrangements. This retreat underpins the government-preferred shared responsibility model. The model emphasizes that responsibility for pest control lies with the citizen rather than the government. This policy shift has been accompanied by swings in public investment



programs.

Nearly all survey participants expressed concern over the lack of clarity on roles and responsibilities in the shared responsibility model. As one respondent explained:

> *"There is a need for a culture shift. Some landholders and industry leaders have expectations of the roles of government based on experience. Understanding and accepting the roles of modern government is required."*

Some respondents questioned the fairness of the model, particularly the failure to match a shift in responsibility with an increase in citizen resources and consequent unsustainable overreliance on volunteers. A related perception was that the lack of clarity on roles will undermine implementation of the shared responsibility policy.

The majority of participants advised that they do not think it is fair to require landholders to account for their use of public funds without requiring government agencies to report on their use of funds and the effectiveness of this investment:

> *"It is not enough to simply talk in terms of landholder or citizen responsibility. Government and industry also need to be accountable. The accountability of public land managers needs to be clearly specified."*

This reflects the theme of accountability observed in a number of responses. Specific concerns included the absence of a comprehensive and transparent system of performance review and reporting, and a focus on administrative paperwork rather than outcome reporting as the basis for accountability. Paperwork was expressed to be an additional barrier to citizen action because community groups and citizens with little time to spare can find the requirements confusing and frustrating.

Ideas to improve clarity and accountability

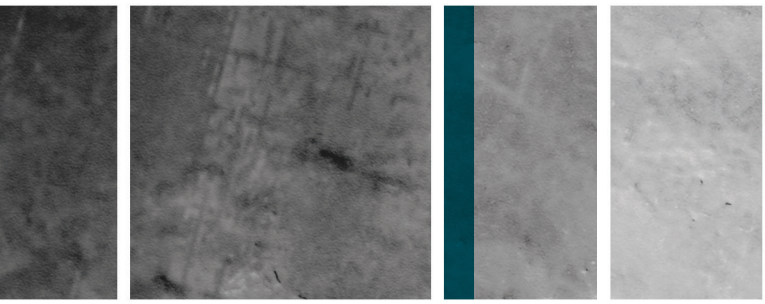
There was general agreement on the need to clarify the roles of different actors within the shared-responsibility model. As one respondent noted, "Most institutional arrangements can be effective when current roles and responsibilities are clear, understood and accepted by governments and other stakeholders". Another noted the value of clarification to "improving the relationships between government and community".

As to how clarification might occur, there was widespread support for "a proper, preferably negotiated, specification of roles and responsibilities and accountabilities that takes into account the problem of capacity to carry out expected roles". Several respondents expressed that such an approach might help landholders secure the funding necessary to fulfil their increased responsibilities.

There were divergent views on the level at which such frameworks should be drafted. For example, one participant called for "regional invasive animal strategies that define objectives, performance measures, monitoring requirements, budgets and roles of all participants". This fits with the regional strategy approach proposed in relation to landscape-scale action. Another participant called for a national policy clearly stating the roles, responsibilities, expectations and accountabilities of different actors.

Our collation of the possible elements of a clear specification of responsibility and accountability that emerged through the research is:

- A negotiated agreement on the obligations, rights and reasonable expectations of landholders, land managers, government and industry;
- Explicit recognition of the contributions of volunteers, communities and landowners;
- Agreed performance commitments, legal accountabilities and enforcement principles of landholders and governments;



- Equivalent stewardship and performance supervision responsibilities for public and private land managers;
- Implementation supports, based on landscape values, economics and capacity, to ensure implementation is possible e.g. tax deductions for key pest management expenses to help landholders fulfil their obligations;
- Open reporting by public agencies on performance and investments; and
- Integrated monitoring and reporting on accountabilities and issues e.g. a "State of Invasive Species report".

4.1.5 Inadequate focus on communicating issues to public

Social perceptions drive political responses and the way in which agencies approach pest issues. Many respondents were concerned that opposition to control measures stemmed from poorly informed community, public and political views and limited public "understanding of why landholders do what they do". A key concern of one respondent was that "the diminishing role of government in the area of biodiversity is sending mixed messages in terms of the importance of incursion control".

Specific communication challenges included:

- Designing communication strategies to secure broad public support;
- Harnessing social media to communicate issues;
- Effectively intercepting negative social media campaigns;
- Addressing animal welfare issues; and
- Better utilization of invasive species management plans to communicate the context and benefit of action.

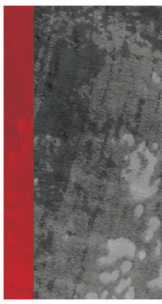
Ideas to improve the communication of issues to the public

There was general agreement on the need for better public communication strategies and tools. Specific ideas included:

- A national communication and community relations strategy;
- Clear expectations and objectives in management plans;
- Better use of communication facilitators;
- Education and training in maximizing social media;
- Teaching pest impacts in school;
- Use of success stories to build public confidence;
- Having messages come from on-ground beneficiaries rather than just government spin doctors; and
- Landholder-led information networks and mentoring programs.

Drawing these ideas together, the following are possible elements of a more effective communication strategy:

1. Sophisticated communications strategies that draw on professional communication skills and good research;
2. A comprehensive communications strategy including face-to-face (e.g. landholders), traditional media (e.g. with local communities) and social media;
3. Education, targeting general knowledge (e.g. communities or schools) and 'how to do it' capabilities; and
4. Widespread training and use of 'scientific best practice' social marketing and communication methods.



4.1.6 Inadequate investment in relationships and respect

Respondents did not constrain their ideas about communication to external relations; they considered communications between governments, communities and landholders. For instance, one respondent noted the need for better communication between governments and landholders if the shared responsibility model is to work. Another considered the failure of government agencies to "develop meaningful partnerships with the community", and the impact of this on local support for government proposals. Most respondents agreed that "generations of mistrust and lack of respect for government and its employees" was a particular hurdle in building relationships between agencies and landholders:

> *"Many communities have already been involved in many failed attempts, so they are very reluctant to try again. Hence, a major challenge will be regaining trust of various community groups and detailing why and how this time it will be different."*

A related concern was a perceived lack of respect or recognition for citizen contributions to pest management. As one respondent surmised, "Citizen experiences need to be positive so their efforts continue and they encourage others".

Ideas to improve citizen-government relations
Respondents offered many ideas for arrangements that demonstrate respect for citizen contributions, promote fairness between citizens and facilitate new relationships with landholders based on respect and trust. Key ideas included:

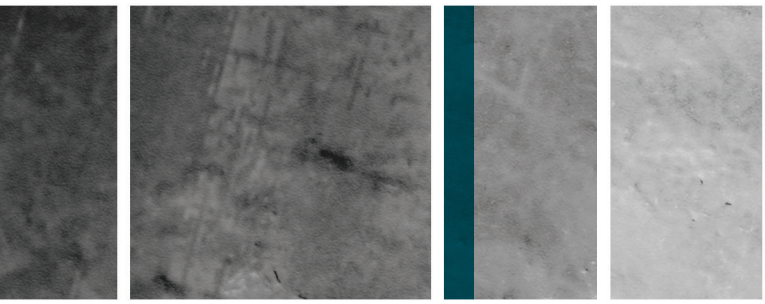
- A collaborative approach to the design, implementation and evaluation of programs and projects, with citizens as valued partners;

> *"What is needed is a priority on more tangible demonstrations of respect and equal negotiated partnerships that are compatible with community needs. These all require an understanding of the needs and values of those that will be participating/ contributing, and will not work if assumptions are used as a basis for understanding."*

- Greater public recognition of contributions by individuals;
- Greater 'citizen-scientist' involvement in data gathering, reporting, interpretation, publications and research communication;
- Greater acknowledgment and action on citizen communications e.g. when citizens report issues or data;
- Greater use of citizen satisfaction report issues or data; and
- Agreed principles for financial support for citizens who help manage the system e.g. expenses and travel.

4.1.7 Practical realities impacting citizen, community and government capacity

All participants expressed concern for the practical capacity of citizens to meet their pest management obligations. A key issues was time, with one respondent observing that "people are time poor in small communities where they take on many volunteer roles as well as managing their own businesses". In addition, farmers are unlikely to prioritise tasks "that have no direct impact on their business". While there was some concern that



landholders are too dependent on "government handouts", most government respondents lamented their reduced capacity to fund "staff members who are trusted by communities to provide support when requested".

A second set of responses advised the challenge of "developing and sustaining citizen interest, ownership and motivation to address issues". Contributing factors included "a lack of knowledge and understanding of the problem and how individuals can effect change", and a reduction in effort "as the project gets results". At that stage, "landholders generally turn their efforts and resources to other pressing issues". Other impediments to citizen capacity included limited financial means to manage pests effectively, the "quality of landholder training in management techniques" and "the knowledge, skills and ability of land owners to manage pest animals in peri-urban areas".

Concerns regarding community capacity focused on the lack of skills and resources to control pests, and the need for communities "to deal with different people from different organisations on the same issue". Other challenges included group disenchantment when funds run out, confusion from a lack of government direction, and uncertainty over what to do after being "led and supported by government for so long".

Several participants noted the importance of community leaders:

> *"Quite often, programs are set up based on key individuals, either landholders or agency staff, and if they leave the program falls over. Succession planning is vital from the start of any program."*

Many respondents noted the inadequacy of agency approaches to building community capacity:

> *"Quite often, people think that providing information or being present in any given location is building the capacity of a community or group. This is only the first step and must be built on if true engagement if capacity building is to occur. They need ongoing support when times get tough."*

While information technology such as social media and mobile apps can provide immediate support and current knowledge, not all respondents viewed information technology as beneficial. Some expressed concerned that its use could "result in an information overload". One observed the disadvantage faced by "communities with poor internet, mobile and Wi-Fi coverage" who are not able to tap into new technologies. Government limitations were also noted, with one respondent perceiving the technical incapacity of "state agencies…to deal with citizen reports of potential new incursions".

Participants confirmed the common hypothesis that government capacity is constrained by demographical barriers including:

- Limitations of distance and "huge areas to be covered";
- Increasing number of absentee landholders;
- Ageing farmer population;
- De-population of rural communities; and
- Increasing urban boundaries.

Ideas to improve citizen, community and government capacity

There was general agreement on the need to ensure capacity building is tailored to individual areas and not a one size fits all program: "We need to avoid seeing communities as amorphous, homogenous entities". There were calls for frontline practitioners to enhance their ability to use new technologies and manage people through training in the "human sciences" (e.g. psychology, behaviour, engagement.). For example, some responses

called on agency staff to meet with landholders "in their comfort zone, i.e. a shearing shed or in the paddock". The common perception was that "having direct one on one contact is still the most effective form of engagement".

One participant noted a particular role for local government in building community and citizen capacity:

> *"Local government should strive to identify community leaders, host community forums, co-ordinate community organisations, and drive consideration of economic, and social challenges through the community planning process."*

In addition to calls for greater investment in capacity building were suggestions to strengthen links between landholders and government agencies. These pivot around the general sense that bureaucratic matters can be a significant 'tax' on community human resources and capability, and can have a disproportionate effect. The following ideas were distilled from the comments:

- Professional redesign of administration for improved user experience including:
  - Streamlining compliance and certification administration e.g. permits, access to pesticides or herbicides;
  - Improving arrangements to access support and reporting e.g. funding applications, training and certification, reporting; and
  - Creating responsive "citizen science" reporting systems, including feedback and follow-up when citizens provide information;
- Involve users in the co-creation, design and review of programs and project management systems;
- Include citizen experiences and program performance in agency performance objectives;
- Train frontline practitioners to use 'scientific best-practice' engagement methods e.g. use of engagement facilitators at sensitive meetings; and
- Monitor and evaluate the use-ability, usefulness and 'friendliness' of administration systems.

Table 3

Theme	Issues	Ideas
Difficulties in coordinating effective landscape-scale action	Difficult to coordinate diverse agencies and land managers Difficult to manage species and people over vast areas Need for different strategies in peri-urban/urban areas Increasing amount of land under Indigenous control	Align policies and programs across jurisdictions Define "landscape-scale" Develop per-urban/urban strategies Dismantle administrative boundaries Reform land access rules Embrace participatory planning Ensure plans include objectives, performance indicators, roles and responsibilities
Unfair cost-sharing, limited government support and insufficient private investment	Significant financial pressure from decrease in funds Funding unreliable and ad-hoc Funding bias toward economic interests Funding decisions influenced by politics Unfair reliance on volunteer groups and citizens Inadequate contributions and support from private sector and markets Inefficient spending	Focus on private philanthropy Use of crowd-funding Integrate pest management into market instruments Create new incentive schemes Demonstrate economic benefits of pest management investment Better use of commercial arrangements
Inconsistent approaches to law, policy, implementation and enforcement	Inconsistent rules No rules mandating adoption of best practice Different approaches to enforcement Difficult to enforce rules on private property Capacity of groups and individuals to influence decision-making Difficult for citizens to keep up with changing rules Difficult for rules to keep pace with new knowledge	Harmonize national, state, local rules, policies and strategies National instrument administered by national body Simplify rules Rules that mandate best-practice
Ill-defined responsibilities and ineffective accountability measures	Lack of understanding and clarity on roles and responsibilities Lack of clarity on accountability requirements Unfair and complex administrative processes	Negotiate agreement on obligations, rights and expectations Recognise citizen contributions Agree on performance commitments, accountabilities and enforcement principles Integrated monitoring and reporting on accountabilities and issues
Inadequate focus on communicating issues to public	Poor understanding of why landholders do what they do Few tools and strategies to communicate sensitive issues	Comprehensive communications strategy Sophisticated research-based information strategies

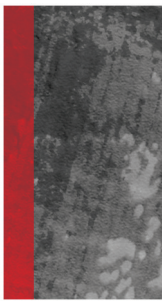
Table 3 continued

Theme	Issues	Ideas
Inadequate focus on communicating issues to public	Limited knowledge social media Poor use of plans to communicate issues	Education and training Practitioner use of 'scientific best practice' marketing and communications tools
Inadequate investment in relationships and respect	Need for more trust, respect and better communication between governments and citizens Failure of government to develop meaningful partnerships with community	FCollaborative approach to design and implementation of programs Recognize and reward citizen action Use 'citizen-scientists' Acknowledge and act on citizen communications Use citizen satisfaction feedback with engagement experiences Agree on principles for financial support for citizens who help manage the system
Practical realities impacting citizen, community and government capacity	Lack of resources for citizens to sustain best-practice action Competing demands on citizen priorities and resources Limited support for citizens and community groups to develop skills Lack of community leaders and succession planning for programs Inadequate agency approach to building community capacity Lack of ongoing community support Demographical challenges	Redesign of administrative requirements Involve users in co-creation and review of programs and systems Include citizen experiences in agency performance objectives Train frontline practitioners in use of 'scientific best-practice' engagement methods Review system elements for use-ability, usefulness and 'friendliness'

5.1 Conclusion

This empirical study helps illuminate the institutional barriers to private citizen engagement in pest management. We did not aim to test the validity or prove consensus on the themes, issues and ideas. This is consistent with the view that policy making for complex problems is a process of weighing diverse evidence about diverse issues in order to make a judgement about what policies would be more efficient, effective and fair. The approach taken was also consistent with the view that transparent dialogue at a number of levels is more robust and likely to build genuine consensus than an apparently objective expert report where the diversity of views and values are concealed. The evidence from the surveys of the need for institutional improvement is consistent with the evidence from our observations and discussions, as are the themes for improvement.

Prevalent institutional issues that impact upon citizen action include limited program coordination within and between jurisdictions, including regulatory complexity. This institutional problem compounds underlying issues of inadequate resources, and the limited effectiveness of legal obligations on landowners to carry out control measures. For citizens to effectively engage in pest management, their roles must be clear and they must have faith in the government agencies that administer the system and oversee their contributions. It is also necessary that they can secure the resources that they need to do what is expected of them. These are all fundamental institutional challenges. Without repeating what is summarized above, the ideas form a basis for creative problem solving. The challenges are substantial but many of them can be solved, or at the worst reduced.



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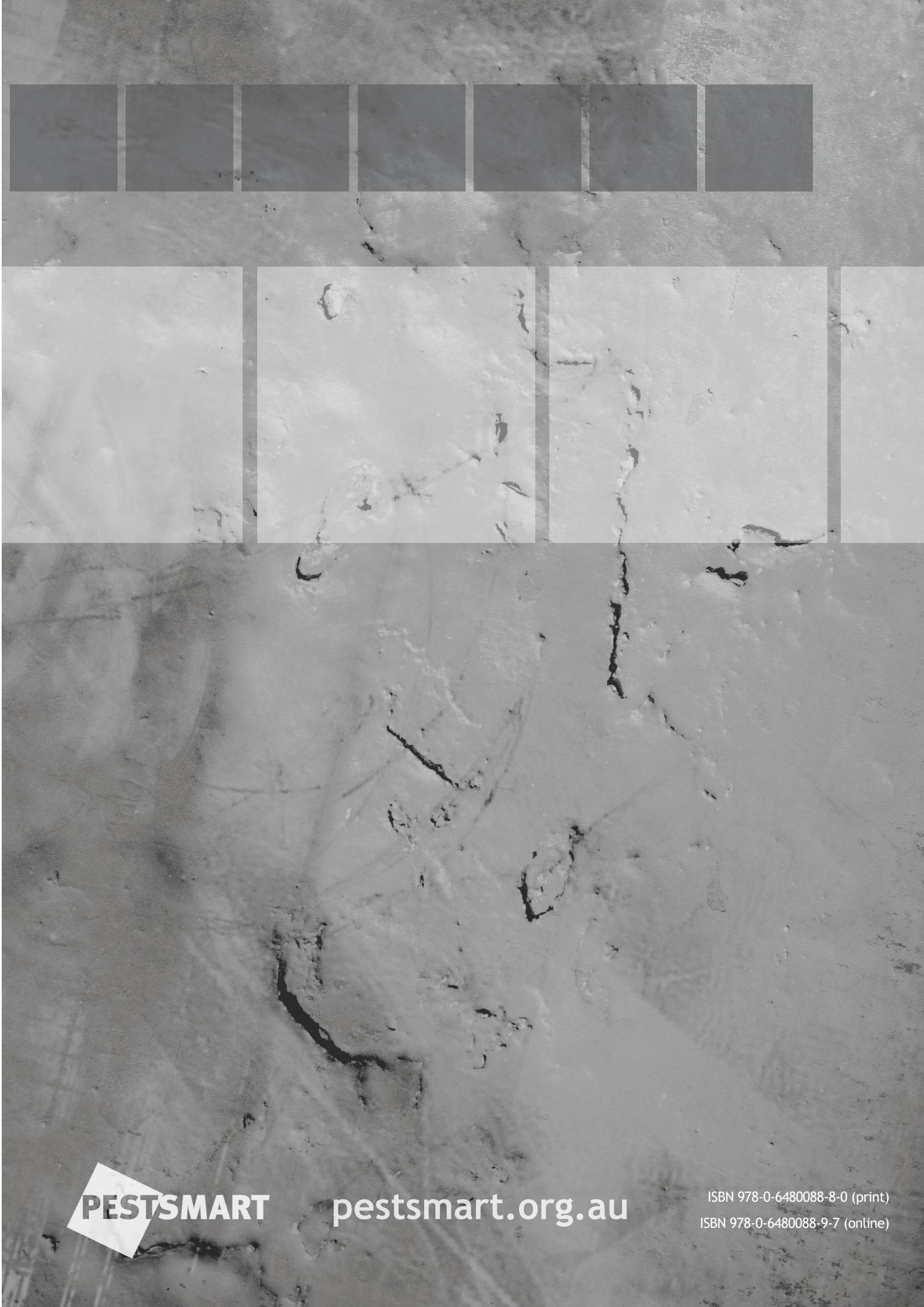

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