PESTSMART

Community action for wild dog management

Case studies of community action for wild dog management in three Australian jurisdictions

Tanya M Howard, Lyndal J Thompson, Prof. Theodore Alter and Paloma Frumento
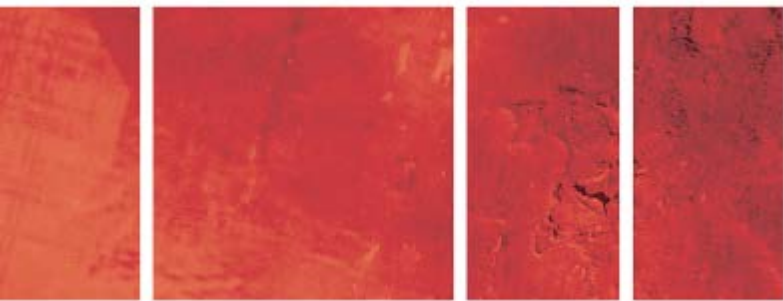
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Business
Cooperative Research
Centres Programme

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2016

An Invasive Animals CRC Project

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Executive Summary

Wild dog management in Australia has historically been understood and studied from the scientific and technical perspective. This involved a focus on the science of best management, and the implementation of scientific and technical control techniques.
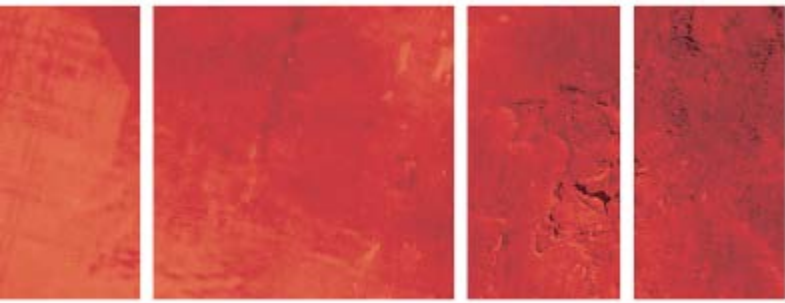
A growing understanding of wild dog behaviour and movement through the landscape has shown that these control techniques are most effective when landholders work together across property boundaries. Best practice wild dog management now recommends coordinated community action as a key strategy for reducing dog numbers.

Achieving coordinated community action can be a challenge. There are many reasons why landholders may not be willing or able to join in a collective effort. Historical patterns of community conflict or entrenched behaviours can be difficult to overcome. Control can be expensive, or inconvenient, and may require individuals to put the interests of the wider community ahead of their own.

The history of government action or industry efforts in a region can confuse the issue, as landholders may be unsure who holds the legal responsibility to control wild dogs. In situations where old patterns of dependence on government control are changing, landholders may be reluctant to take ownership of the problem, and this can cause resentment on both sides.

Wild dog management is an emotional topic. Landholders who experience wild dog impacts feel attacked, vulnerable and anxious about the security of their livelihood. When dog impacts are heavy, there is an atmosphere of crisis and landholders are strongly motivated to take action. This motivation can be hard to maintain over time, particularly as dog impacts reduce.

Understanding these challenges can help landholders, industry and government stakeholders in their efforts to achieve long-lasting coordinated action. Moving

beyond individual attitudes and perceptions of the pest, it is useful to understand how collective action has been implemented in real life examples.

This report documents a research project that examined three different forms of collective community action in three different geographical settings. Three in depth case studies were developed using narrative techniques of data collection and analysis. The case studies outlined the journey from wild dog impacts to community action in each setting. Useful information about community engagement and coordination was revealed.

This research was designed in a process of collaboration, knowledge sharing and support between IACRC Program 4 and the National Wild Dog Facilitator. The report provides findings that might support implementation of best practice wild dog management as described in the National Wild Dog Action Plan. It will also be of interest to practitioners or scholars concerned with community action, community governance, and complex issues of natural resource management.

Glossary of terms

Australian Wool Innovation (AWI)

Environmental Protection and Biodiversity Conservation Act 1997 (EPBC)

Invasive Animals Cooperative Research Centre (IACRC)

Invasive Plants and Animals Committee (IPAC)

Meat and Livestock Australia (MLA)

National Wild Dog Action Plan (The Plan)

National Wild Dog Facilitator (NWDF)

Natural resource management (NRM)

Northern Mallee Declared Species Group (NMDSG)

1. Introduction

"Invasive life… has the power to create communities." (Everts 2015 p.196)

The study of invasive species management is largely conducted as a branch of wildlife ecology or agricultural science. Scientific methods are employed to study the species, the habitat, the ecological factors leading to the invasive characteristics, and the impacts on biodiversity, agricultural productivity and landscape amenity. Over the past decades there has been a growing awareness of the need to understand the human dimensions of invasive species management (Manfredo 1989, 2009, Decker, 2012), particularly to avoid repeating common management mistakes (Miller 2009, Dickman, Marchini et al. 2013). The challenge of achieving landscape scale coordinated action for invasive species control has stimulated human dimensions research into settings to support voluntary action by private citizens (Dickman 2010, Lidstrom, West et al. 2015, Sjölander-Lindqvist, Johansson et al. 2015, Marshall, Coleman et al. 2016).

This report addresses the core promise of the IACRC Program 4 to *'Facilitate effective community action for invasive species management'*. Invasive species can be a trigger for community formation, particularly when there is a collective recognition of the threat, acceptance of the problem, and the need for a collective response (White, Ford et al. 2008). Conversely, the identification of a problem requiring community action can also be a trigger for community conflict when conflicting values and potential management solutions highlight community differences (Madden and Quinn 2014). It is the latter situation in particular that requires supportive and effective community engagement approaches. Understanding these management dynamics requires that the human dimensions of invasive species management are fundamentally embedded in the biophysical and technocratic definition of an ecological problem (Beck, Zimmerman et al. 2008). Human values and beliefs influence ideas of 'invasiveness' and 'impact', with flow-on consequences for individual motivation and community action (Cook, Liu et al. 2010, Everts 2015). Legal responses or policy directives that do not consider human behaviour and values

as instrumental to increasing the viability and effectiveness of management strategies, are unlikely to succeed (García-Llorente, Martín-López et al. 2008, Martin, Low Choy et al. 2016).

This report outlines a qualitative research design that investigated how specific communities responded to the threat of wild dogs. In this context the definition of community is broad and includes all stakeholder involved in management – such as landholders, technical officers and policy makers. Key players in this context are the invasive species practitioners for whom skills in community engagement are necessary, but largely neglected in the framing of approaches to management. The evidence suggests that the recognition and acceptance of a threat is not sufficient to create a collective community response. There is a complex social dynamic of community formation and ongoing engagement underpinning the progress, from threat awareness to collective action (Everts 2015). The research design reflected the 'engaged scholarship' stance adopted by IACRC Program 4, which resists the urge to tell community members the answer to their problem (Bridger and Alter 2006) and supports co-production of knowledge with industry partners and research stakeholders through narrative enquiry and social learning. The ambition is that the *"end of the encounter… [does not result in] the acceptance… of the [researcher's] preordained values and beliefs. Rather, it is to pose problems and questions for critical dialogue."* (Fischer 2005 p.191)

This democratic view of knowledge creation helps identify and illuminate power dynamics, social hierarchies, learning and asymmetries in power that may be significant in understanding questions of community participation, community led action and community engagement. Social learning about community engagement can build skills that are largely neglected in the scientific training of many invasive species practitioners, an important strategy to increase capacity for dealing with the human dimensions of the work (Ballard 2006, Ford-Thompson, Snell et al. 2012).

This effort to understand the human dynamics underpinning invasive animal management is part of Program 4's underpinning ideological commitment to learning

through interaction. Learning is stimulated through repeated engagement with behaviours, ideas, practices, values and analysis that are firmly grounded in the lived experience of the community. Where possible, the institutional is connected with the cultural framework and the formal with the informal, in recognition that "*neither individuals nor institutions are a starting place for analysis. Both are the outcome of a process*" (Schmid 2008 p.62).

This report is for individuals who work with community members to achieve collective action for wild dog management in Australia. This includes policy makers, program designers, wild dog controllers, land holders and all other stakeholders who have an influential role to play in the 'guiding coalition' that supports community led action for wild dog management.

1.1. Wild dogs in Australia:

1.1.1. The institutional context

Invasive species are regulated through a mosaic of different strategies, legislation and action plans that reflect the fragmented governance of the Australian federated system and the landscape scale of the problem. Constitutional responsibility for biosecurity and pest management rests with the State governments, with the Federal government providing strategic policy and financial support and, where appropriate, encouraging coordination across jurisdictional boundaries. The Australian tradition of cooperative federalism has resulted in a nested system that, in this context, is guided by the Intergovernmental Agreement on Biosecurity and the Australian Pest Animal Strategy. Figure 1 presents an example of a nested system of invasive species governance in New South Wales (NSW).
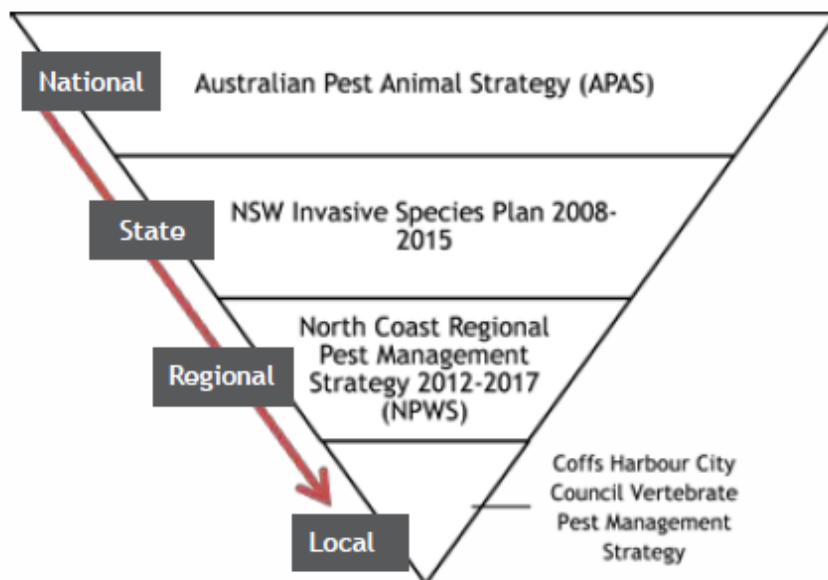
An example of how a local pest management strategy in NSW fits under the broader regional, state and national policy framework.

Figure 1: An example of how a local pest management strategy in NSW fits under the broader regional, state and national policy framework (sourced from Invasive Animals Cooperative Research Centre 2015)

Tensions between Federal government oversight, State sovereignty and direct funding for delivery of natural resource management (NRM) activities have been actively evolving in the decade long 'regional' experiment of NRM across Australia (Curtis, Ross et al. 2014, Martin, Kennedy et al. 2012). During this period of experimentation, NRM funding from the Federal and State governments has become increasingly erratic, in both the focus of priorities, and the scale at which these programs are planned and implemented (Curtis, Ross et al. 2014).

Table 1: Wild dogs have a range of impact in Australia. These different impacts motivate management and control strategies, and are summarised here.

Economic impacts	Environmental impacts	Social impacts
Attack small stock animals, particularly sheep and goats; reduced flock size; dispersed flocks leading to loss and stress; lambs are particularly vulnerable; reduce wool and meat yield; reduce breeding stock; increased control costs (baits, fencing, trapping).	Apex predator in Australian ecosystem; impacts on small mammals, marsupials, rodent populations.	Individual and family stress; change from sheep to cattle or crops reduces farm labour; townships adversely affected by reduced labour force; closure of shops and services; rural communities weakened; possible conflict with neighbours.

Wild dogs have a range of economic, environmental and social impacts which are illustrated in Table 1. Best practice wild dog management requires landholders understand the rules of their specific regulatory framework, and apply this in combination with their local knowledge of landscape and production.

Government, industry and landholder groups all have a role to play in ensuring that wild dog control is legal, effective and sustainable over time.

1.1.2. Government context

Like other natural resource management issues, invasive animal control becomes a Federal issue when pest impacts fall within the purview of key national legislation. For example under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) (1999) certain pests that have national impact are declared as key threatening processes or pests of national significance, and national threat abatement plans are put in place. These plans provide guidance for all stakeholders in addressing invasive species impacts, and also shape the priority objectives for research bodies, industry and NRM organisations that seek funding through a range of Federal and State government programs.

Wild dogs are not currently declared as a key threatening process under the EPBC Act; however, they are identified by the National Invasive Plants and Animals Committee (IPAC) as a 'Category 5 / Extreme' species.[1] Category 5 means that the animal is a recognised pest that is both widespread and established, while an 'extreme' classification indicates that such animals 'should not be allowed to enter, nor be kept in any state or territory without permission'.

Wild dogs are also identified as a pest animal under the Australian Pest Animal Strategy, a national strategy for the management of vertebrate pest animals in Australia (Natural Resource Management Ministerial Council 2007). Throughout these documents, wild dogs are described as established and wide spread pests, with responsibility for control falling to the owners or managers of the land where wild dogs occur (PestSmart 2012). There is limited Federal funding for coordination of control, and each state and territory implements different regulatory arrangements.

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[1] The Invasive Plants and Animals Committee (IPAC) is a cross-jurisdictional sectoral sub-committee of the National Biosecurity Committee (NBC). The Committee is responsible for implementing the Intergovernmental Agreement on Biosecurity (IGAB) and providing policy and technical advice to the NBC on national weed, vertebrate pest and freshwater invertebrate pest issues.

The interaction between generic and specific legislation, policy and procedures, means that wild dog control activities vary from location to location.

1.1.3. Industry context

Wild dogs pose a serious threat to the sheep industry (Ecker, Aslin et al. 2015). Landholders who experience heavy impacts can leave the industry (Binks, Kancans et al. 2015), with flow-on effects for industry bodies, such as Australian Wool Innovation (AWI) , Meat and Livestock Australia (MLA) and Wool Producers Australia, that rely on producer levies and membership (Wicks, Mazur et al. 2014). The industry has addressed the lack of national coordination through the development of The National Wild Dog Action Plan (the Plan). The Plan formalises principles of best practice wild dog management that have been developed and implemented in field experiments over the past two decades (Hunt 2005, WoolProducers Australia 2014).

The National Wild Dog Action Plan has a strategic focus on promoting a nil-tenure, community led action model (2014). The Plan clearly acknowledges the role of local knowledge and public expertise community groups, and presents an overarching framework to promote best practice approaches to the wild dog issue. The Plan suggests that a "*national approach will lead to more consistent action across jurisdictions*" while also meeting local needs through "*enhanced opportunities for collaborating and coordinating control efforts*" (2014 p.5). Goal 2 of the Plan specifically aims to build the capacity of all stakeholders, including the community, to manage wild dogs.[2] Successful community-led action is considered a touchstone

[2] This report contributes to Goal 2 of the Plan (Increase awareness, understanding and capacity building with regard to wild dog management) particularly Action 2C.1 (Improve adoption of wild dog best practice management through effective communication, education and training); as well as Action 3A.2 (promote and support a community-driven landscape-scale approach to management) under Goal 3 (Mitigate the negative impacts caused by wild dogs).

for best practice, particularly in generating support from industry and government stakeholders as the community demonstrates capacity to work collectively without relying on government initiation of action. This model of success is the strategic backbone of the Plan, and local knowledge is seen as instrumental in achieving community acceptance and action. Although there is limited empirical evidence about the impact of nil-tenure approaches on community action and species control, anecdotal accounts highlight the key role of local knowledge and the leveraging of this knowledge through the cooperative space of the local landholder action group (Hunt 2005).

Industry support for wild dog management has included financial support for a National Wild Dog Facilitator (NWDF), and a cohort of community coordinators across Australia. Through partnerships with State government departments and the Invasive Animals CRC (IACRC), these coordinators have been part of the Plan's implementation strategy, which has also been supported through Federal funding.

1.1.4. Landholder context

Although landholders primarily undertake wild dog management to reduce their stock losses, they are also motivated to take action in support of other landholders (Wicks, Mazur et al. 2014). This social motivation is important because best practice wild dog control requires coordinated action; ongoing and sustained financial investment; and planning and participation across boundaries (Fleming, Corbett et al. 2001, Fleming, Allen et al. 2014). Landholders who are involved in community efforts are increasingly willing to accept personal responsibility for wild dog management on their lands (Binks, Kancans et al. 2015). Although wild dogs may be the obvious problem, the challenge of developing and implementing effective control requires that landholder efforts to work collectively be investigated so technical approaches can be enriched with knowledge of community dynamics.

A review of the social impacts of wild dogs in Australia identified that different values and attitudes to wild dog management were a major barrier to achieving effective and coordinated action (Thompson, Aslin et al. 2013). Conflict might be related to different land tenures, different control measures, and whether individuals feel it necessary to control wild dogs at all (Addison and Pavey 2016). Wild dog control is often highly personal, and this points to the mediating potential of wild dog management groups in engaging stakeholders with different perspectives in a collective planning and implementation process (Marshall, Coleman et al. 2016).

Wild dog management groups are often formed in response to an increasing wild dog threat. Facilitation and coordination plays a crucial role in forming and sustaining these collective efforts. Landholder groups can provide the interface between individual landholder experience of pests and top-down government responses through legislation and policy implementation (Marshall, Coleman et al. 2016). Participation in a wild dog management group may alleviate landholder feelings of isolation and loss of control (Wicks, Mazur et al. 2014). These groups access important local knowledge by increasing communication between individuals and creating a place to share information (Fischer 2005, Fine 2012). However, positive internal group function and good collaborative relationships with industry and government are not assured. Wild dog management groups require adequate funding resources and coordination support to be sustained over time in order to realise their full potential in reducing wild dog impacts (Ford-Thompson, Snell et al. 2012, Binks, Kancans et al. 2015).

1.1.5. Group contexts

To understand how individuals can work together to achieve positive collective action for wild dog control, it is necessary to understand how issues are experienced and defined in small group interactions (Bridger and Alter 2008). Groups are a useful unit of analysis for community-led collective action because they build and rely on

self-enforcing norms of trust, surveillance, participation and action (Fine 2012). In groups, individuals work collectively and through shared experience they can create a unifying narrative that makes sense of group function and the broader context (Fine 2012). However, groups are not intrinsically 'good' (Harrington, Curtis et al. 2008), and can report dysfunctional, toxic and unproductive collective behaviours (Madden and McQuinn 2014). By accessing a range of individual stories, and considering them in relationship to each other, it is possible that group analysis can tell us something interesting and meaningful about collective action in invasive species control.

1.1.6. Different perspectives on wild dogs

Despite a scientific focus on understanding the behaviour of wild dog populations, knowledge is still incomplete and sometimes contested (Allen, Engeman et al. 2011, Allen 2016). Landholders hold contrasting perspectives on pack behaviour, the role of apex predators and whether there is a distinction to be made between 'wild dogs' and 'dingoes' (Fleming, Allen et al. 2014, Addison and Pavey 2016). Individuals in rural communities may juggle different identities related to their role as primary producer, neighbour, and community member. These identities can be particularly difficult for non-landholder stakeholders, such as technical officers, who are part of the broader management community and who may be juggling loyalties to their clients and their employer (Barr 2011). These different identities may inspire people to contribute to collective management strategies as active and responsible community members and good neighbours (Sjölander-Lindqvist, Johansson et al. 2015). These identity frames may also encourage a change in farming enterprise, from sheep to cattle, in direct response to the falling wool price, and increased vulnerability from wild dog attacks (Wicks, Mazur et al. 2014). The 'problem' of wild dog control then becomes linked to broader economic pressures and the political system that mediates these pressures (Bacchi 2009).

The story of wild dog management is tightly linked to the fortunes of the sheep industry in Australia (McLean 2012). Sheep were a foundational agriculture industry and key themes of rural development, economic markets and community viability are intertwined in this story (Allen, Engeman et al. 2011, Fleming, Allen et al. 2014). These themes occur in the case study stories presented in this report and are also visible in the way that key documents such as control strategies and plans talk about wild dogs. Some of these themes, such as baiting, fencing and coordinated control, are restricted to the specific topic of wild dog management. Other themes such as rural alienation from the city 'elites', powerlessness in the face of globalisation, and a sense of doing it tough, can be seen as cutting across state and territory borders.

As individuals recall stories of success and failure in wild dog management, they also reflect on their community and wider society, where the particular challenges of life in rural communities, or making a living from agriculture, are no longer widely understood in Australia (Horne 1985). An historical affection for the Australian outback, the Aussie battler and a literal interpretation of the country being built on the 'sheep's back', are all important in how farmers frame the 'problem' of wild dog management (Gill 2005).

In the media and in conversation with affected landholders, wild dogs are often portrayed as active protagonists (Woodford 2003). They are described as smart, devious and willfully destructive. They seeming to delight in the heartbreak they cause, taunting efforts to control them as they walk past baits to get to the sheep (Ecker, Please et al. 2016). Many producers see them as a genuine foe and express a grudging respect for the animals (Woodford 2003). The mobile nature of the wild dog challenges conventional approaches to property management. Dogs do not recognise distinctions between private and public lands, for example, and this creates tension between individual property rights and the public benefits of collective action (Fitzsimons and Wescott 2008).

There is an active and lively debate in Australia about the role that dingoes play in the environment and whether they are the same as 'wild dogs' (Allen 2016). Arguments about the possible conservation benefits of retaining a top-order predator in the landscape cause tension in the livestock industry (Fleming, Corbett et al. 2001, Allen 2016). The dingo is included in the definition of wild dogs in the National Action Plan, with the caveat that the Plan "*acknowledges the environmental and cultural significance of the dingo and its conservation status and legal protection in a number of jurisdictions*" (2014). This acknowledgement may not be sufficient to address community concerns about the biodiversity implications of widespread control of wild dogs (Addison and Pavey 2016). The National Wild Dog Action Plan recommends ongoing wild dog control as a strategy to reduce hybridization threats and assist dingo conservation in Australia.

1.2.   Collective action for wild dog management: key concepts

1.2.1.   Thinking about community

Wild dog action groups can take many forms. They may be government-led or industry-sponsored. They may focus on one species or work across a range of landscape management issues. Regardless of the variation in the way they start or how they work, the crucial common fact is that they bring community members together to take action.

When thinking about broad terms such as 'community-led action' it is important to be clear about exactly how the 'community' is being defined (Kahane, Loptson et al. 2013). This helps with all aspects of project planning and implementation, and can inform measures of success or failure (Howard 2017). Community may exist at the local level or be nationally organised (Whitman 2008). Variations include affiliations of local landholders, volunteer activity groups, regional networks, and organisations whose membership may not be regional but based on shared interests such as
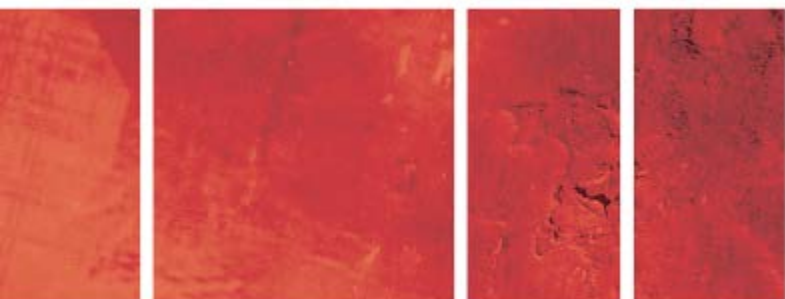
industry associations, political parties, and non-government organisations (Harrington, Curtis et al. 2008).

Communities are also increasingly found in the virtual world, with online delivery creating dispersed communities of interest (Souter 2012, Wu 2015). Non-government organisations may formalise communities of interest, coalescing individuals around specific issues and coordinating community activism (Dellinger 2012). Definitions of community must pay attention to a wide range of factors including *'location, social interactions, and the relationships between the resource and the individuals'* (Hillman, Crase et al. 2005). Not all community members have the same skills, financial resources or access to information. This can lead some community members feeling excluded or overlooked (Peterson 2011, Howard 2015). Understanding these differences may address common causes of non-participation (de Souza Briggs 2007).

Irrespective of what type of community is being considered, it is clear that they are informed by factors that may not be visible to those outside and bring knowledge of specific contexts to difficult issues (Irvin and Stansbury 2004, Larson and Brake 2011). Community perspectives may generate innovative ways of framing a problem as well as suggesting solutions that are grounded firmly in existing networks and capacity for action (Johnson, Lilja et al. 2004).

1.2.2. Thinking about participation

Participation and non-participation are terms that regularly appear in regards to collective action for invasive species control. Each term emphasises the role of the individual in 'making or breaking' collective efforts at landscape scale invasive animal management (Shortall 2004). Non-participants are criticised for creating gaps in protective barriers established by other community members, and reducing the effectiveness and impact of the collective action. This can lead to resentment between stakeholders, and alienation of community members (Peterson 2011).

A broader understanding of participation and non-participation can improve community engagement for invasive species control. Participation be categorised in simple terms as either:

- individual (individual actions and choices);
- public (engagement with the structures and institutions of governance as well as broader community values and experiences); or
- social (collective activities).

Common features are that participation in a collective action context is voluntary; is about taking on-ground action; and has a collective or connected sense of purpose (Brodie, Cowling et al. 2009).

This approach "*challenge[s] assumptions that non-participation is about apathy, laziness or selfishness. Participation opportunities need to complement people's lives and respond to people's needs, aspirations and expectations*" (Brodie, Cowling et al. 2009 p.9). The challenge of collective action includes understanding the range of social, political and economic reasons why individuals may not participate in a collective response to a problem.

Realistic expectations about participation are vital if community action is to be well planned and realised (Howard 2017, Shortall 2004). This reinforces the need for clear objectives in the pursuit of a community-led wild dog control program. Any form and activity of participation will be influenced by the distribution of power and resources in the surrounding society (Brodie, Cowling et al. 2009, Shortall 2004). Although practitioners may not be able to remove these structural dimensions, they can be well informed about the institutional context and share this knowledge with participants through well designed community engagement processes (Howard 2015).

1.2.3.　Thinking about power

While collective action might be widely accepted as the best practice approach for invasive species management, it would be naive to assume that this is a neutral proposition. Power is an important dynamic in convening community action groups and the more clearly this is described and identified, the better equipped invasive species practitioners and policy makers will be to understand both the potential and limitations of collective community action (Brennan and Israel 2008). Understanding community action requires recognition that *"those with access to resources, or those with the capacity to mobilise resources, [will] accumulate power"* (Brennan and Israel 2008, p.86). Resources include money, access to information, control of knowledge and the human resources required to implement on ground action (Martin, Low Choy et al. 2016).

Controlling the definition of a problem, setting an agenda for addressing a problem, resourcing a process and framing the terms of evaluation are all ways that power can be exerted in a procedural fashion (Black 1997), supporting and reinforcing existing power dynamics (Boxelaar, Paine et al. 2006, Smith and Wales 2000). Taking early and guiding control of the agenda is a form of power play (Black 1997, Shepheard and Martin 2011). This includes situations where government or industry bodies implement a policy directive or institutional reform through a particular process and resourcing. Guidelines for participation, representation, funding and consultation may be manipulated in practice (Howlett, Ramesh et al. 2009, Lewis 2008). This phenomenon is commonly recorded as a significant feature of community engagement programs that operate under the auspices of administrative bureaucracies such as government departments and private industry groups (Moynihan 2003, Wallington and Lawrence 2008, Whitman 2008).

There is an inherent tension in attempts to mobilise collective community action: while capacity-building strategies can create community power, it is unlikely to persist without the continued support of existing community networks (Brennan and Israel 2008, Bridger and Alter 2008).

Other power dynamics impact on Australian rural communities (Browne and Bishop 2011). The political agenda of external and internal stakeholders can influence the way that problems are defined and what responses are considered feasible or receive support. For example, the political attention of non-rural citizens who have limited awareness of land management is naturally drawn to urban issues. Rural communities can struggle to drive the political agenda. In this context, political power rests with those who advocate for the rural sector. Understanding who benefits from the promotion of political messages is a necessary part of thinking about power (Gaventa 2006, Fischer and Gottweis 2013).

1.2.4. Thinking about knowledge

Invasive species exist in a complex biophysical and social landscape (Fitzgerald, Fitzgerald et al. 2007). Many policy interventions are based on assumptions of both scientific and social values (Bacchi 2009). However there is an increasing awareness of this underlying subjectivity (Fischer 2005) and this has led to calls for increased community engagement as policy makers and practitioners realise that incorporating community values into decisions about invasive species management can increase the likelihood of community acceptance (Coralan 2006).

There are structural reasons why community or local or situated knowledge is not recognised or adequately utilised, and these reasons have much to do with issues of power and participation (Gaventa 2006). Power is often linked with knowledge, including access to information, skills, influential networks and the how the knowledge is shared (Epstein, Bennet et al. 2014, Graham 2014). This includes the authority to define what is considered 'real' or 'valid' knowledge, which can lead to certain knowledge systems such as traditional knowledge and non-expert views being devalued (Bridger and Alter 2010, Barber, Jackson et al. 2014). Controlling the definition of what is 'real' or 'valid' knowledge, particularly from a scientific

perspective, creates an imbalance that can inhibit participation by non-expert community members (Gaventa 2002). It also reinforces the power of experts to set the agenda. Selecting which piece of knowledge will be shared through media, meeting documents, or interpersonal interactions, facilitates a power imbalance that can be consciously or unconsciously maintained (Cook 2015).

Evidence suggests that when faced with difficult decisions in complex contexts, better decisions and more effective action will result from the combination of specialised knowledge with public values and local knowledge (Australian Public Service Commission 2007). This can be described as a 'working synthesis' (Barber, Jackson et al. 2014), an approach that recognises that knowledge production is a human enterprise, and every citizen will have some expertise to contribute. Such expertise may be specific to the context of a particular issue or experience, and not broadly generalisable.

This suggests that a incorporating multiple types of knowledge can help build the capacity of individuals to join in collective action (Mathews 2005). Individual community members must feel confident to name and frame issues in ways that are meaningful to them and their context (Lakoff 2010). This may require a challenge to the dominant way of knowing, and the extension of a deliberate invitation to those who do not feel recognised or acknowledged for the knowledge they hold (Cornwall 2002, Coralan 2006).

In this context, group development can be seen as a fundamentally democratic endeavour (Gaventa and Barrett 2012) that fails when community engagement practitioners underestimate the contribution of community expertise and inadequately integrate this knowledge into planning and management. The expertise required to effectively build and facilitate community-led action must be informed by an awareness of how knowledge and power interact to shape the process of community action. This awareness is particularly important for practitioners who may not be trained in community engagement. Engagement skills are an important part of

community development when a goal is to empower communities to manage their own groups over the long term.

2. Methodology

2.1.   Introduction to the framing of the research

Underpinned by a broad program commitment to developing applied outcomes, dialogue with the National Wild Dog Facilitator (NWDF) program influenced the team's understanding of the research needs of wild dog control programs. The research dialogue began with the vexed question of **how to create and sustain collective community action for wild dog management in Australia**?

Developing applied 'engaged' research is not a value-free proposition. The research problem and the research question risk being framed to support a particular agenda. Researchers must weigh this risk with the benefit of producing new knowledge that can be picked up and rapidly applied by an identified audience. In order to offset the risk of bias and subjectivity, this project has implemented a reflective research practice that includes:

- articulating bias and assumptions;
- making the research design explicit; and,
- issuing an invitation for readers to critically engage with the work to challenge or extend the interpretation provided here.

2.2.   Research questions

The primary objective of the research was to increase our understanding of how individual citizens organise community action to collectively and successfully manage wild dogs. Key concepts emerged from the initial literature review and during consultation with research partners. Each concept was connected to assumptions about both the naming of the research problem, and the framing of the possible answer, as detailed in Table 2.

Table 2: Assumptions underpinning the research design

Research objective	Research Question	Output	Underpinning Assumption
To develop case studies of successful wild dog management groups	What do successful wild dog management groups look like? How do individual members define success?	Identify and define key success criteria	Successful wild dog management groups achieve sustained, coordinated community action on wild dog control.
To understand the significance, or otherwise, of key community engagement processes such as external facilitation and coordination, in stimulating collective community action on wild dogs	What community engagement processes do successful wild dog management groups use? How do individual members identify key engagement strategies?	Identify and define group development processes	Successful wild dog management groups require external coordination and support to achieve and maintain group development.

To investigate the human dimensions of invasive species management it is important to access perspectives informed by real world cases. Case studies provide a lens for qualitative research that seeks to understand the complex and messy real world experiences that may inform a research question (Neuman 2011). The case study approach was considered a suitable choice for this research project as it concerned:

- A 'how' or 'why' question…about
- A contemporary set of events
- Over which the investigator has little or no control (Yin 2009).

A multiple case study design allowed exploration of the different legal and policy settings; demographic and biophysical contexts; and community profiles (Patton 2002, Johnson and Christensen 2008). The case studies focused on three geographic areas where communities had attempted, or successfully implemented, a collective community approach to wild dog management. Case studies were selected in consultation with the National Wild Dog Facilitator. The selection criterion were identified as:

- An existing and continuing wild dog management group;
- That was seen as 'successful' in achieving collective community action on wild dog management;
- And had received external coordination/facilitation support through the National Wild Dog Management program.

The case studies present in-depth consideration of how these particular wild dog action groups were conceived, developed and sustained over time. The success or otherwise of these groups was explored in the context of not only wild dog management, but other social dimensions such as community capacity, community power and resilience to changing institutional and funding landscapes. Rather than strive to generalise across the case studies, the analysis presents the nuances of each case through collecting multiple perspectives of stakeholders.

2.3. Data sources

These case studies combined documentary sources with interview data to describe the wild dog management cases at a particular moment in time. All attempts have

been made to ensure the accuracy of the case studies but due to the highly political and fast moving context of wild dog management, inaccuracies are likely to emerge over time.

Documentary sources included policy documents, project documents, media sources, and public facing websites.

2.3.1. Interviews

Initial research participants were purposively selected to access core representatives of each case study, for example group leaders. Snowball sampling was then employed once the researchers were on location to access other group participants as suggested or mentioned by interviewees. Table 3 lists the role and number of individuals interviewed for each group. The primary aim of interviewee selection was to access different perspectives on the experience of collective action in their case (Neuman 2011). Case studies were located around Australia to capture the diverse context within which wild dog management occurs. Locations included Mount Mee in southern Queensland, Ensay/Swifts Creek in the alpine area of Victoria, and Esperance in southern Western Australia (Figure 2).
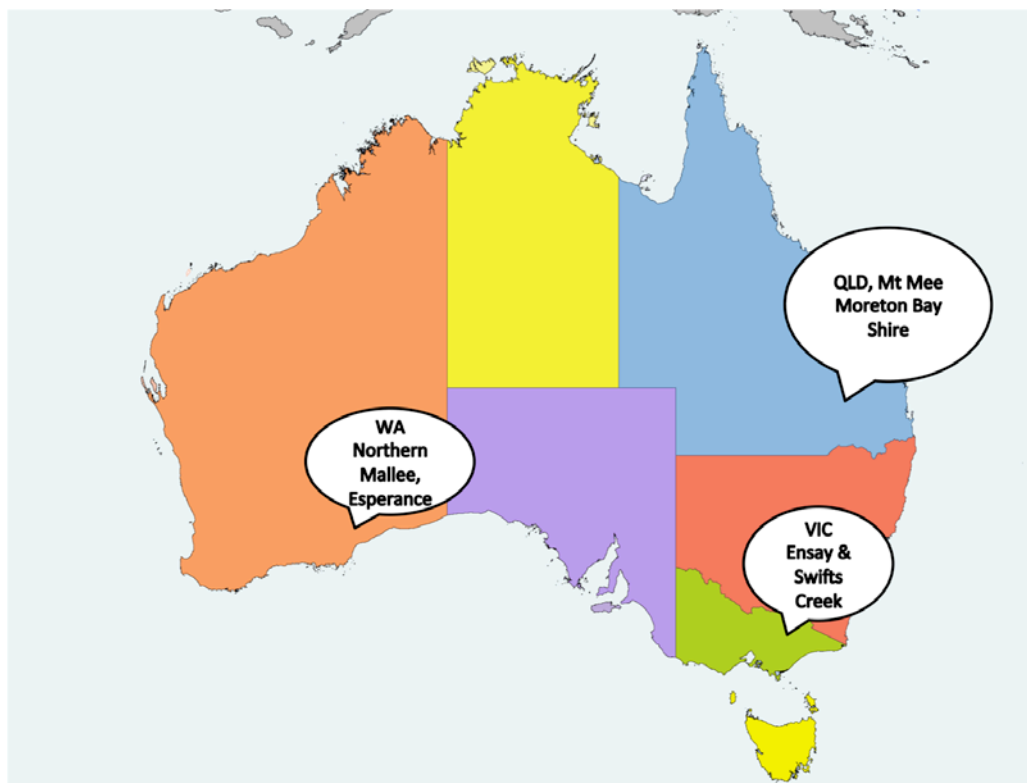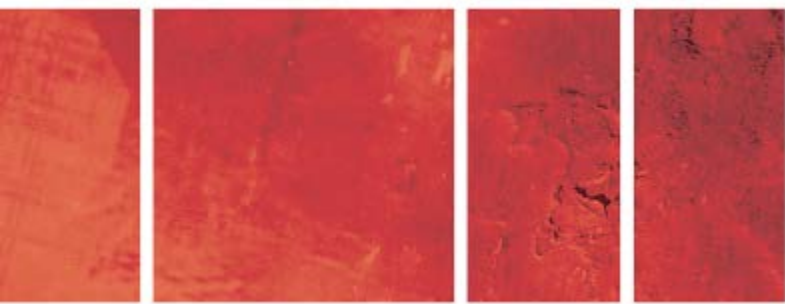
Figure 2: Map of Australia showing case study locations.

The research interest in personal experiences of collective action in wild dog management encouraged an approach to opening up a dialogue with the respondent through a narrative-based interview technique. A semi-structured interview guide was prepared to provide prompts for researchers and flexibility in the phrasing and timing of pre-designed questions, enabling rapport to develop between the interviewer and the subject (Herda 1999). Informed by an interest in narrative techniques, the semi-structured interview instrument was designed to take advantage of story-telling devices (Clandinin and Connelly 2000, Goodson, Biesta et al. 2010) and became a living document as researchers encountered additional points of interest not originally captured by the guide. The interview questions and prompts are provided at Appendix 1.

Table 3: Details of interview subjects and their role in each case.

Role	Mt Mee	Victoria	Northern Mallee
Group leader	1	2	1
Landholder/group participant	5	8	3
Wild dog facilitator	1	4	1
Government coordinator	2	1	3
Parks and Wildlife	1	1	2
Dogger		1	1
Politician	1		
NRM group			2
Total	11	17	13

This approach takes full advantage of the benefits of qualitative research, to offer a context-rich and subjective response to the research topic (Flyvbjerg 2001). In this research method, there is acceptance that the human subject is not always a 'rational, information-processing subject' (Holloway and Jefferson 2000 p.36) and thus their answers to even a standardised questionnaire will be dependant on their level of self-knowledge, relation to the subject matter and familiarity with the research format itself.

2.4.   Data analysis

Data analysis was undertaken in stages, through successive application of thematic analysis and narrative analysis techniques.

Thematic analysis is a useful way to uncover and explore significant themes through a process of repeatedly interacting with the data to find recurring ideas, terms and references (Bernard and Ryan 2010, Joffe 2012). Themes were drawn directly from the narrative accounts in a process of inductive analysis.

The research interest in understanding personal stories of participation in collective action encouraged the use of **narrative analysis** techniques. Narrative enquiry was selected as an appropriate way to explore human experience in the complex and changing context of natural resource governance (Webster and Mertova 2007).

Each interview was transcribed and summarised in a template that identified key narrative devices in order to capture the way that interview subjects told their individual story of wild dog management (Corvellec 2006). The resulting plot summaries were then coded using the qualitative software Nvivo in order to combine the descriptive account of each case with analysis of significant ideas, events and connections to the research objectives of the study (Piore 2006, Ritchie and Spencer 1994). These approaches to narrative analysis sought to record and make transparent the inherent subjectivity of the narrative form, including the act of analysing and interpreting the text to extract meaning (Flyvbjerg 2001). The template and codebook enabled consistency and facilitated discussion between the researchers in the pilot phase of data analysis. Both are provided at Appendix 2.
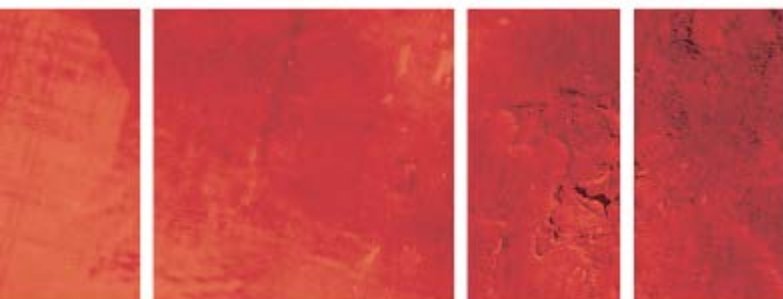
3. Results

3.1. Case study summaries

The narrative analysis resulted in three in-depth case studies stories. Detailed narratives have been developed for each case study. Due to their length and associated in-depth analyses, these narrative accounts of community action for wild dog management will be made available in a separate publication. A brief summary of each case is provided here. Themes of information, knowledge, recognition and how the problem was framed all emerged as significant factors in developing a confident community-led program. All three cases took place in the context of changing government investment in community engagement for wild dog control.

3.1.1. Mt Mee wild dog control program – Queensland

The Mt Mee wild dog case study concerned a local government program that supported local landholders to participate in coordinated control. The Mt Mee example showed how local government leadership supported landholders to increase community participation in wild dog control.

Making it easy for landholders to participate was identified as the most important ingredient for success in this case. The local government program demonstrated a commitment to respectful communication with landholders and developed procedures to build relationships across the region. Council staff used local wild dog data to engage landholders in conversation, integrating scientific expertise with locally produced knowledge. This approach created a safe and embracing culture that was shown to nurture community participation.

By reducing the administrative and regulatory burden on individual landholders and community leaders, local government enabled responsible and motivated members of the community to focus on building relationships, sharing information and creating a norm of civic duty and participation amongst their neighbours.

The local council's willingness to act for the public good created political and social capital that led to a generally supportive and encouraging atmosphere for wild dog control. The needs of the farming community, local government and state agencies became aligned with the aspiration to make a civic contribution to the wider public good.

3.1.2. Northern Mallee Declared Species Group – Western Australia

The Northern Mallee DSG (NMDSG) case documented the challenges faced by a single-species wild dog action group in a changing policy context. A looming State government reform to the funding and management regime was seen to threaten the group's long running and well-tested model of community-led action.

Initially formed to protect sheep farming interests, the group had been successful in adapting their message to stay focused on wild dog control, while accessing support from other agricultural industries. A strong and highly visible Chairperson led with passion and conviction. Members were willing to take action in support of the leader, utilising media contacts and industry networks to implement a strategy of community-led action that was strongly tied to political advocacy.

The Chairperson was committed to a long running campaign to extend the wild dog fence. This tenacity inspired loyalty from the group members, and grudging admiration from government and industry. However strong leadership can be difficult to replace and this raised questions about the long-term sustainability of the group.

The increased responsibilities and workloads that come with formalised group structures are clearly illustrated in this case, raising important questions about how to strike the best balance between community-led action and external coordination support from industry or government.
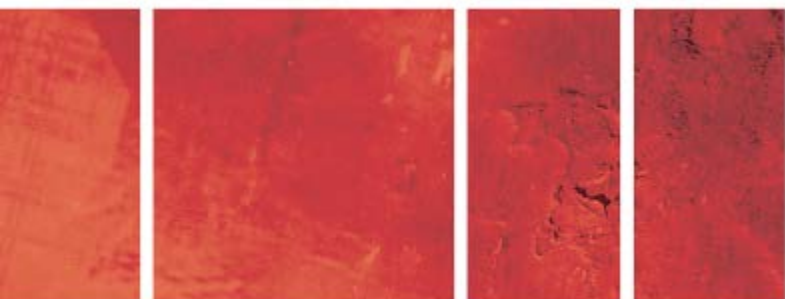
3.1.3.　Victorian wild dog action groups: Ensay and Swifts Creek

The neighbouring communities of Ensay and Swifts Creek faced similar threats from wild dogs but responded in very different ways. This case study revealed how local context influenced the way an issue is understood by different communities. Through group conflict, dissent and discord, a significant connection between knowledge of the issue and power to steer the agenda was identified.

Despite differences of opinion, each group articulated a common goal to sustain a viable sheep industry. They shared similar concerns for the survival of their townships and a desire to actively manage their own destiny. However their approach to gaining new knowledge and working with government and industry stakeholders was very different. Each group developed a strategy that drew on the perceived strengths of their landholder community. This revealed how uneven levels of education, wealth and political connections can be influential in shaping a community response.

3.1.4.　Thematic analysis: Success criteria

A key objective of this research was to identify the factors that might predict 'success' in community-led wild dog management. The case studies were originally selected because they illustrated a version of success that supported the nil tenure planning approach and the value of external facilitation services in providing coordination and support to landholders. However a thematic analysis of the narratives revealed that there were many possible interpretations and indicators of 'success' (see Table 4). These were usually described in relation to the objectives of each individual in the case study. Analyses focused on exploring the dynamics of collective action rather than verifying the ecological benefits. If individuals expressed an opinion about the 'success' of the community action in controlling wild

dog numbers, this was accepted as part of their subjective account and was not independently verified.

These results show that there is no single measure of success for community action in wild dog management. Ideas of success and failure may be linked to reduced wild dog impacts on stock, or social cohesion and community building. In Ensay and Mt Mee, cooperation between varieties of stakeholders to reduce regulatory barriers was regarded as a success factor. In NMDSG, the elevation of the dog fence extension as a serious policy proposal demonstrated the success of the group in community leadership. Community acceptance, widespread support, funding, political recognition and enjoyable social interaction were all raised as indicators of success. In Ensay, increasing awareness of animal husbandry and a change in focus from dog control to herd health saw sheep numbers increase, revealing another important indicator of success. In Swifts Creek reduced dog numbers and the ability to retain sheep were key indicators of success.

An important dimension of success in wild dog management is the sustainability of the effort over time. The continuing presence of the threat with no possibility of eradication creates an ongoing requirement for community action to keep the pest under control. The long history of community leadership in the Mt Mee example, and the ability to learn and adapt, suggested that resilience and adaptability were key measures of ongoing success. In Ensay and NMDSG, high levels of interpersonal trust and peer recognition were crucial for building group resilience to barriers, and encouraging sustained participation. For Swifts Creek, the sustained effort was seen as a battle for justice and recognition, leading to a 'battle weary' community over time. In this respect, each group recorded different measures of achievement, from a reduction in stock impacts or increased numbers of participants in bait collection days.

Table 4: Attributes contributing to the success of collective action/ group development in invasive species management (as identified by interviewees)

Criteria	Attributes	
Homegeneity	Invasive species	Shared agricultural history
	Social cohesion	Shared experiences
	Land-use	
Relationships	Between group members	Extension providers
	Landholders	Cooperation
	Government	Trust
	Surrounding community	
Strong norms	Good neighbour	
	Public good	
Capacity of members	Politically active/astute	Ability to navigate bureaucracy
	Broader biosecurity awareness	Knowledge
	Clear leadership	Experience of rural context
	Diplomacy skills	
Conflict awareness	Recognise conflict	
	Strategies to manage this	
	Agreed approach	
Recognition	Feeling of success	
	Being heard	
Management impact	Reduced pests	Ability to remain in sheep production
	Increased/stable stock numbers	Reduced stress
Governance	Agreed structures - collaboration	Willingness to formalise
	Funding	Leadership
	Responsibilities	

4. Discussion

This discussion combines key insights from the case study data with broader research about community development and collective action in the context of contemporary wild dog management practice in Australia.[3]

4.1. Community development

Working with community to achieve collective action is best understood as a community development exercise (Bridger and Alter 2006). Community development is associated with the use of participatory techniques for planning and evaluation, and may support the devolution of power from government to community members through a range of different mechanisms such as partnerships, collaborations or co-management arrangements. Each of these require different degrees of participation from the community, industry and government, in a dynamic model of learning and experimentation, if they are to realise their potential (Berkes 2009). Learning about community development requires reflection on success and failure, as well as leadership commitment to do things differently (Popper and Lipshitz 2000, Janssen, van der Voort et al. 2015). The thematic analysis identified the capacity of group members, quality of relationships and conflict management, awareness of problems and good governance as key success factors. These are all attributes that can be enhanced through effective community development approaches to community engagement.

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[3] This report provides a brief discussion of the results from the thematic analysis. A narrative analysis will accompany the publication of the complete case study narratives.
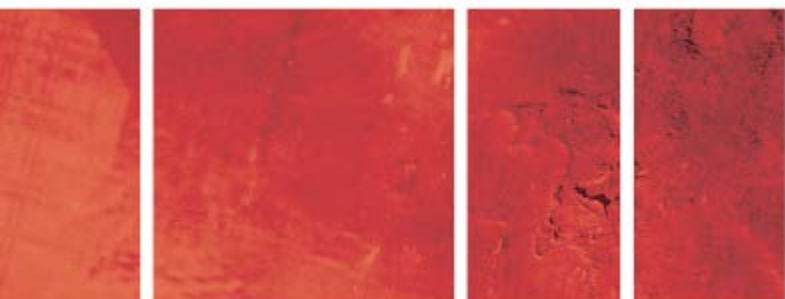
4.2.   Leadership

Each of these cases report a changing and evolving context for leadership, community action and wild dog control. Change can be disruptive, however it also offers possibilities for community leadership to flourish, if the settings and support are right. Good community leadership, supportive expert advice, network development and a sense of possibility or momentum are all important enabling settings for community-led action (Harwood 2015). By incorporating the 'public knowledge' that each community member brings to the wild dog issue, leaders can build a pathway for change that is understood and accepted by those who need to take action (Fischer 2005). This creates an alignment of values, activities and intentions and reduces risks to collective action, such as distrust and inequality (Dickman 2010).

The impact and value of leadership is exemplified in each of the cases differently. In Mount Mee, leadership came from an external source – a local government management officer. In the NMWDG a strong executive supported a charismatic and politically astute leader. In Victoria, the Ensay group benefitted from politically experienced leadership, while Swifts Creek experienced divided leadership with limited political experience.

4.3.   Change

The response of each case study group to the challenges of change shows that change can be perceived as a positive or negative experience. Regardless of the individual's perspective, change always brings uncertainty, and dealing with uncertainty requires adaptation (Janssen, van der Voort et al. 2015). Existing social cultures, procedures and long entrenched patterns of behaviour are barriers to adaptation (Ron, Lipshitz et al. 2006). Resistance to change is a defensive response that points toward fear of suffering negative consequences from trying something new (Argyis 1991). Learning can be uncomfortable and challenging, particularly in an environment of uncertainty

and reform (Lipshitz, Popper et al. 2002). Determining the range of human dimensions that might be influencing acceptance of change can add a deeper dimension to efforts for collective community action.

The role of community development and engagement are key to positive experiences of change. In the NMDSG, the group responded proactively to a changing policy environment through attempts to engage positively with regional NRM stakeholders and government extension officers. Mount Mee group participants were reticent about changed wild dog management approaches but supported the initiative of the local government team. Change had caused conflict in the Victorian case study, with the Ensay group embracing changes to management supported by the state government and the NWDF, while Swifts Creek resisted changes in their approach to wild dog management. The resistance to change had an impact on funding and support for the group.

4.4.   Social capital

Individuals who are linked together in a network of power and influence are more likely to undertake successful collective action (Fine 2012). Understanding these linkages is an important step in developing the collective capacity of the group (Granovetter 1973, Westermann, Ashby et al. 2005) by identifying new opportunities and ways to overcome barriers. Group members who are well-connected and able to communicate across interest groups are likely to be effective at disseminating new ideas and building coalitions (Kilpatrick 2007). These groups demonstrate the 'social capital' required to work cohesively and implement activities together (Ostrom 2007). This leads to improved emotional resilience and wellbeing for individuals who participate in collective action in their rural community (Lyons, Fletcher et al. 2016).

Building social capital for collective action requires trust, reciprocity, and interpersonal relationships between those individuals who need to work together to achieve their objectives (Marshall, Coleman et al. 2016). Establishing a common
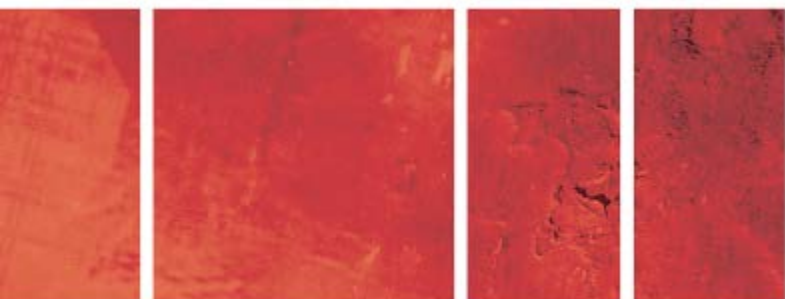
purpose is an essential ingredient for successful collective action (Mandarano 2009). Working collaboratively to develop shared agendas, objectives and actions is a way of building shared purpose and enhance trust between community members (Graham 2013). These activities also support a form of knowledge sharing that can break the power imbalance caused by inequitable access to information. The importance of social capital is reflected through the indicators of success identified by interviewees, such as relationships and cohesiveness.

4.5.   Power

Experiences from community development across a range of policy areas show that for 'empowerment' to succeed, specific strategies to transfer power must be implemented (Eversole 2011). This assumes that empowerment is the desired outcome. In the case studies, nil-tenure planning processes created a forum for knowledge sharing that allowed expert and public knowledge to interact around the definition of the wild dog problem. This participatory approach recognised that controlling access to knowledge is a manifestation of power (Graham 2013) and that individual and group empowerment are influenced through knowledge sharing. All cases talked about the problem of information being withheld by government in regards to decision-making or high-level allocation of resources.

The tension between the Ensay and Swifts Creek groups illustrated how a feeling of disadvantage was linked to differences in education level and capacity to access and evaluate expert knowledge. The case studies all describe some form of power struggle between the landholders desire for independence, and their need for expert advice to guide their collective efforts. The power to select which piece of knowledge will be shared through media, meeting documents, or interpersonal interactions, facilitates a power imbalance that can be consciously or unconsciously maintained (Woolcock 2010). While it is difficult for power brokers such as government or industry bodies to genuinely devolve power to community leaders

(Graham 2014), the vision of sustainable supported community-led action requires that genuine efforts are made to strengthen community capacity to access, integrate and act on expert knowledge. Such efforts can be supported through effective community development and engagement strategies as well as building the capacity of individuals, including landholders, government and industry.

4.6.   Capacity building

There are specific and concrete ways to support capacity building for community-led action. These strategies have been developed in fields such as health and emergency management with a long history of community capacity building to support institutional objectives (Robins 2008). A key learning from this body of research is that capacity building strategies are often developed by well-intentioned project planners, with limited recognition of the needs of their target audience, who remain as 'outsiders' to the process (Coulston, Reid et al. 2012). As each group is likely to have different capacity issues, it is not surprising that generic strategies often lead to policy failure or sub-optimum outcomes (Robins 2009). The case studies illustrate that community action requires care and consideration of different values in order to build trust and encourage sustained participation. Interviewees mentioned capacities such as leadership, diplomacy skills, good engagement approaches and political astuteness as important to group success.

4.7.   Recognition

Community development takes time and effort. For community members, this investment in relationship development and group facilitation can be a disincentive if the costs are not adequately valued or recognised (Marshall 2013). Peer recognition was important in all cases, in the form of acknowledgement by neighbours or other community members. Recognition by local media helped build the profile of the collective effort and prod government to recognise the seriousness of wild dog
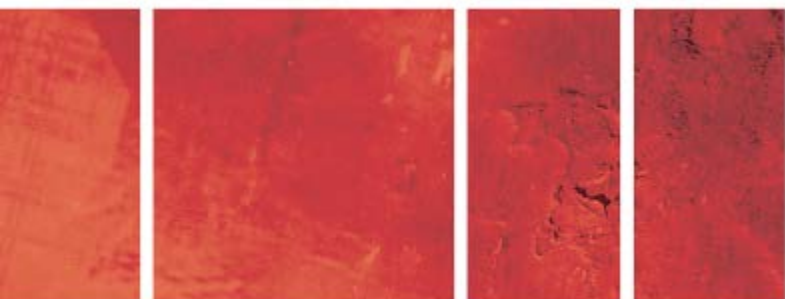
impacts. Recognition of management efforts and success were also identified as important to group confidence, especially in Swifts Creek. Additionally, recognition of the value of local knowledge and contexts was identified as key to building trust. All these forms of recognition increased the group leader's reputation and by association, raised the profile of the collective effort. This is known as 'reputational politics' (Fine 2012) a valuable asset for community groups and a necessary ingredient for third party brokers such as the National Wild Dog Facilitator.

4.8. Coordination and support

External facilitators must present a trustworthy blend of expertise, personal relationships and commitment to community solutions (Sjölander-Lindqvist, Johansson et al. 2015). Successful facilitation recognises that "trust is the core link between social capital and collective action" (Madden and McQuinn 2014 p.823) and builds a practice of community engagement based on establishing and maintaining trusted relationships with all parties involved in wild dog management. The data identified that mutual understanding was a core contributor to developing trust and acceptance of the expertise held by individuals and institutions.

External brokers provided a valuable, although not highly visible, service in each of the selected cases. Guided by the model of community engagement described in the National Wild Dog Action Plan, they provided support to wild dog action groups to address specific issues of conflict, coordination and resourcing. For example, community members in each case expressed scepticism about the capacity of public land managers to contribute to the collective effort of wild dog control. This led to feelings of antagonism where government was seen to be applying top down pressure on community groups to take increasing responsibility for wild dogs without supporting resources. While these feelings did not prevent farmers from taking action, they did have negative impacts for landholder/government relationships (Graham 2014, Marshall, Coleman et al. 2016). External facilitation was able to

address the lack of trust between the public service and the landholder community, and to alleviate negative responses to policy reform (Allan 2008, Brugnach, Dewulf et al. 2011), through conflict management and knowledge sharing techniques of community engagement (Madden and McQuinn 2014, Sjölander-Lindqvist, Johansson et al. 2015). This facilitation was especially effective where there was respect for others experience and knowledge, such as the multi-stakeholder process implemented at Mt Mee.

4.9. Success

A key concern of this research was to identify the factors that might predict 'success' in community-led wild dog management. The case studies were originally selected because they illustrated a version of success that supported the nil tenure planning approach and the value of external facilitation services in providing coordination and support to landholders. However a thematic analysis of the narratives revealed that there were many possible versions of 'success' as illustrated in Section 3.2 of this report. This suggests that the way that success in community action is described will be linked to individual perspectives of what the benefits are, and where they accrue (Schmid 2008).

This does not answer the persistent question of whether increased community capacity to work collectively will automatically lead to better biophysical outcomes in the form of more wild dogs killed. Establishing a robust causal outcome between the two fields of activity is notoriously difficult (Beierle 1999, Ford-Thompson, Snell et al. 2012) and has not been the objective of this research which was focused on understanding how community development activities impact on the capacity of a community group to act collectively.

In order to recognise the impact of community engagement efforts in connection to wild dog impacts, it is necessary to think of success as having 'multiple dimensions' (Berner, Amos et al. 2011), including sustainability over time, and in specific
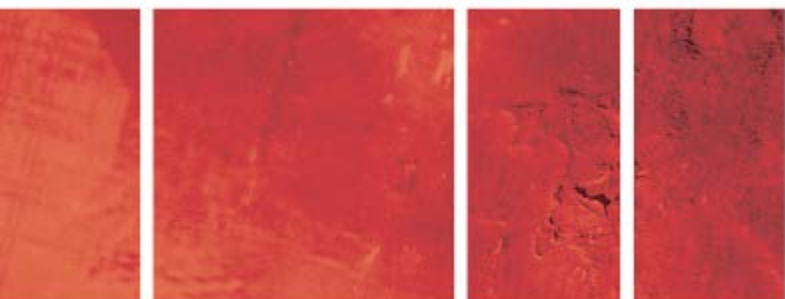
geographical contexts (Dovers 2010, Cohen and McCarthy 2015). Policy interventions and accountability mechanisms tend to reduce community action to measures that can be counted, and this can inhibit innovative ways of recognising and evaluating impact (Taylor 2007, McKinney and Field 2008).

For example, public funding programs for wild dog management often ask for evidence that can be easily quantified, such as the number of baits distributed; the number of farmers attending a field day; and so on (Boxelaar, Paine et al. 2006, Wallington and Lawrence 2008). These measures focus on technical inputs and neglect the broader impact of community development efforts, such as increased community cohesion; increased skills and capacity to lead community action; conflict resolution; relationship and trust development (Koontz and Thomas 2006, Madden and McQuinn 2014, Sjölander-Lindqvist, Johansson et al. 2015). This tension between technical and social inputs is artificial and unhelpful in addressing complex landscape scale problems such as wild dogs. Given that wild dogs roam across the landscape regardless of tenure, collective action among people distributed across that space is required to increase the efficacy of the technical inputs. The social and the technical are interdependent and both require attention (Batie 2008). This dynamic complexity is at the heart of wicked problems like dog control, and community development inputs provide the enabling setting for communities to co-create strategies that can increase the possibility of success. For example, Ensay combined animal husbandry and wild dog management as linked issues; while the NMWDG initiated the construction of a fence as a joint collaboration with the government, led by the group.

The bureaucratic tendency to focus on technical measures rather than community development outcomes diverts attention from the powerful influence of the status quo and the potential need for change (Fischer 2005, Barr 2011). It also reinforces a fear of reporting failure, despite the excellent learning opportunity these failed experiments represent (Prager, Nienaber et al. 2015). Measures of success that are built in collaboration with the affected community are likely to record more diverse

outcomes, including enhanced dog control, than those currently associated with wild dog control programs. Through collaborative problem definition and identifying measures of success, wild dog programs can increase the capacity of individuals and communities to take collective action for wild dog control (Weber 2003), Taylor 2007, Ostrom 2010).
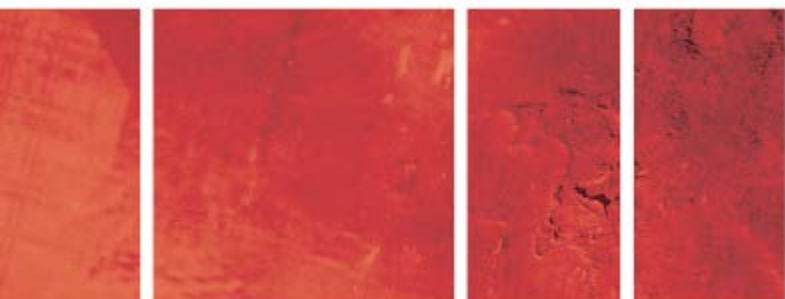
5. Conclusion and recommendations

This report argues that best practice wild dog control must blend the natural science expertise in control technology and wildlife ecology, with social science expertise in human dynamics and community development. Achieving collective wild dog management at the landscape scale is a complex objective that cannot succeed if the technical is prioritised over the social, or vice versa.

The three different cases introduced in this report show that there is always more than one way to 'name and frame' an issue. Each community has distinct settings that interact with the legal and policy context of their jurisdiction. Constraints to financial and human resources influence the reasons for participation and non-participation. Understanding these significant factors can increase the potential for better planned, more realistic and sustainable wild dog management.

Working with community requires that individuals and organisations develop an awareness of how knowledge and power interact to shape the process of community decision-making. Practitioners of community engagement must build their *interactional expertise* - the skills to integrate different bodies of knowledge (Coralan 2006) – to usefully address situations where community members are faced with difficult decisions in complex contexts. Interactional expertise enables policy makers, scientists, practitioners and community members to combine specialised knowledge with public knowledge and values, leading to more robust strategies for action.

This ability to combine expert and public knowledge reflects a commitment to genuine power sharing. Practical examples include participatory planning processes, such as the nil tenure approach; and can also include deliberative practices of policy debate; or collaborative governance efforts. Power sharing requires a conscious effort from all parties to share knowledge, create fair and equitable processes, and remain open to alternative strategies beyond the usual way of doing business.

This report concludes with a series of recommendations that can support efforts to improve collective community action for wild dog control. These recommendations combine the results of the data analysis with insights from the literature, and are relevant to policy makers, program designers, community facilitators and community members alike.

5.1.   Recommendations

As the report has emphasized throughout, the likelihood of success will be increased if recommendations are pursued in close collaboration with affected stakeholders.
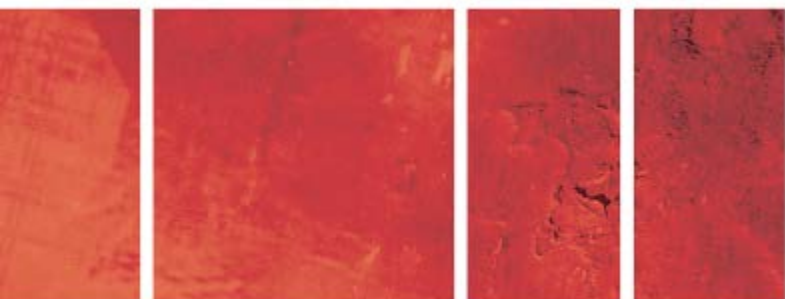
In collaboration with the affected community:

- Develop options for long-term resourcing of community development and engagement processes;

- Build community governance skills such as leadership, group management and conflict resolution;

- Maintain and extend support for community governance through networks of external coordinators and facilitators;

- Reconsider assumptions about non-participation and develop strategies that are realistic about the capacity for individuals to take action;

- Develop skills in facilitation, communication and active listening;

- Adopt and implement participatory planning processes;

- Recognise different types of knowledge as valid and develop fair and equitable processes to integrate these;

- Develop community defined criteria of success and adapt accountability requirements accordingly;

- Redesign funding agreements to enable adaptive management through formative and summative evaluation.

A more detailed reporting on the case studies will be the subject of further publications.

Acknowledgements

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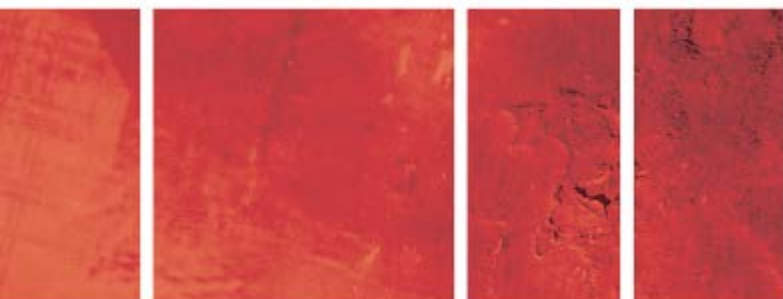
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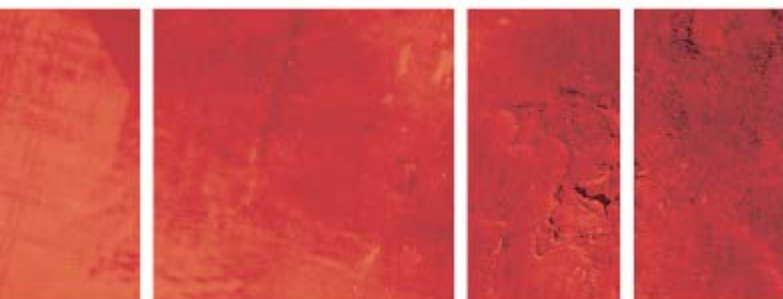
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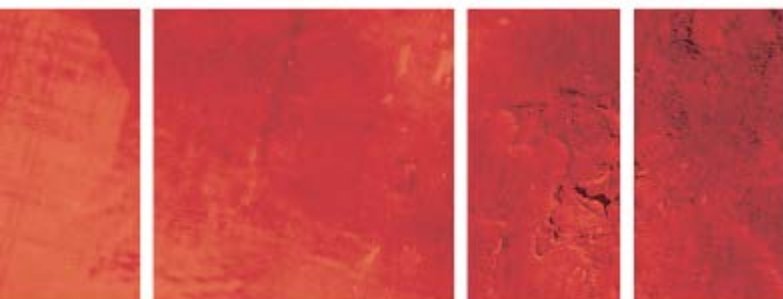
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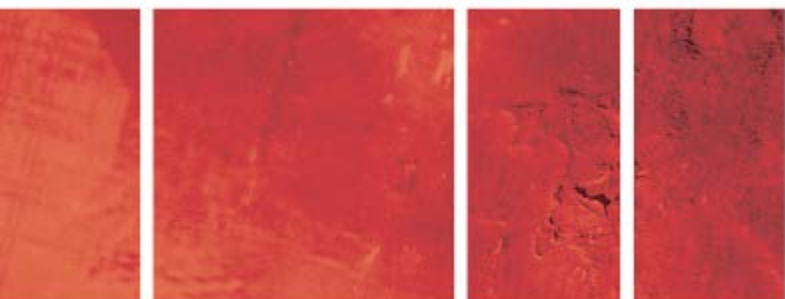
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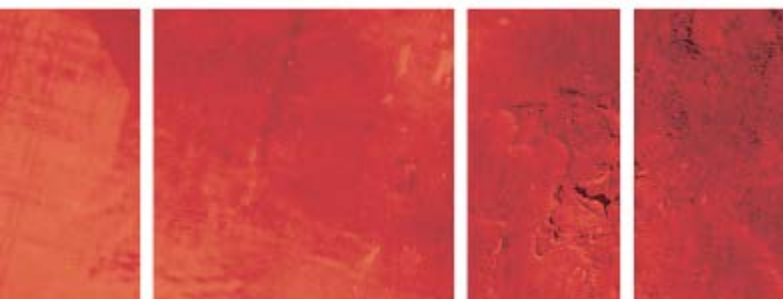Yin, R. (2009). Case study research: design and methods. California, Sage.

Appendix 1

Semi-structured interview questions and prompts

1. Can you tell me about your involvement with wild dog control and groups?
   a. (prompts: Who was involved? How did it get started? How did it end? What worked well and what didn't? In your opinion has the group been successful? What does/did success look like?
2. What was the situation like before the group started coordinated action?
3. Why did you become involved a group? (why did you become part of a group)
4. How do you benefit from being involved?
5. What benefits do you think others get?
6. What are some of the challenges or problems the group has? With wild dog control in general?
   a. (prompts: How does the group make decisions? How were these things challenges? Were the barriers/challenges specific to organisations, resources, people or processes?)
7. How would you improve how the group, or wild dog control, happens? What do you think your groups needs to do the best job it can?
8. What are the group's challenges for managing wild dogs?
9. What are some of the things you would like to see done differently in the future, and why?

Appendix 2

5.2.   Narrative analysis – transcript summary template

- Detail narrative features (main protagonists; story start, middle, endings; tensions/conflict; resolutions; pathway/chronology.)
- What is the simple plot of the story that they are telling the interviewer?
- Retain analytical awareness of the active role of the reader/analyst - include your impressions of the overall story: how did it make you feel? What jumps out at you from the story? Why do you think this is so?
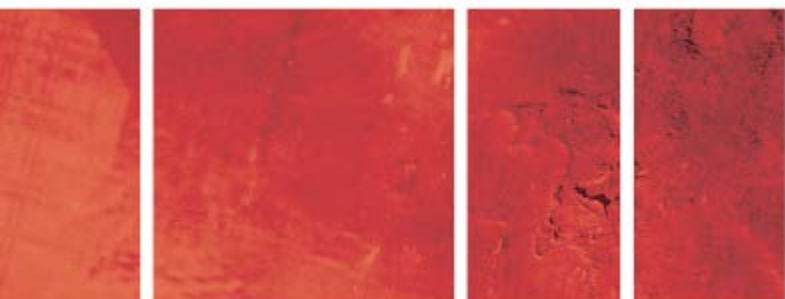
5.3.   Code book

Code narrative summaries for the following enquiries:

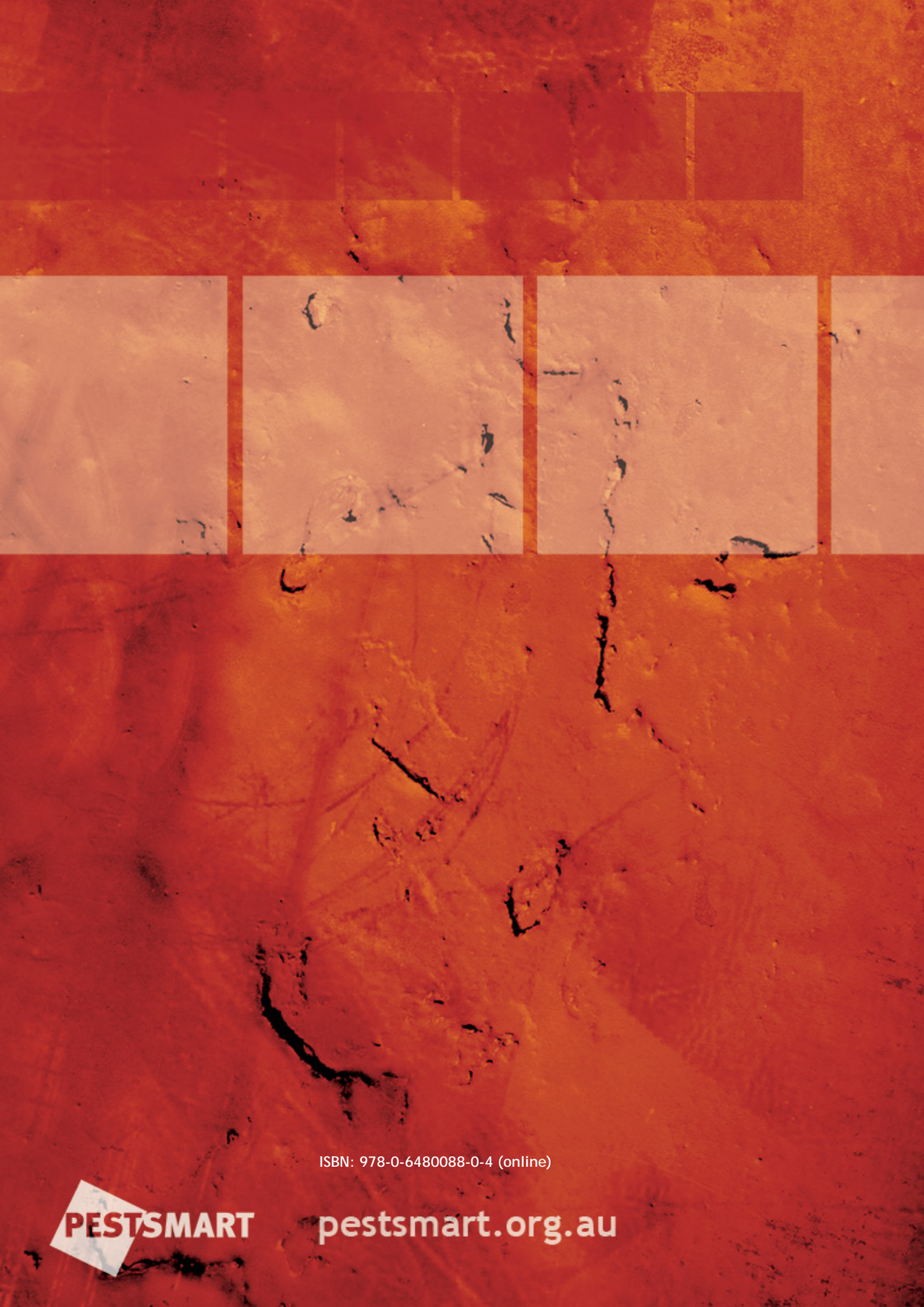| Investigative queries	Code book	Examples
The origin story of the group?	Origin	Sentences or paragraphs relating to the way the group came into being
What role did facilitation play in the operations of the group?	Facilitation - external/internal	Specific reference to coordinators, facilitators, officers etc. Identify if **external** to group (e.g. Govt or industry employed) or **internal** (landholder, community member)
How do they define or describe the 'problem'?	Problem naming - definition/description	The problem is…. Wild dogs; government policy; no compliance etc.
How do they frame the issue/problem?	Problem framing	The problem is a result of… government policy; community conflict; sheep/dogs/cattle etc.

Investigative queries	Code book	Examples
How do they position themselves in the story?	Positioning	I'm not much of a team player/ I don't like going to meetings/I'm not interested etc.
How do they define or frame success (or failure)?	Success/Failure	No dog attacks/a cooperative group/a long lasting group/sheep on the land/getting out of sheep etc.
Do they make any references to 'institutional' drivers and their impact on the wild dog issue?	Institutional drivers/barriers	Specific references to legislation, policy, funding, etc and how they are relevant to the case
What do they see as the key drivers of 'community' behaviour in relation to the wild dog issue?	Community (social dimensions) drivers/barriers	Influential individuals; key events; media events; norms etc?
How do they describe the way the group works?	Group dynamics	Harmonious; conflicted; independent; apathetic etc.
How do they describe their individual motivations?	Individual drivers/motivations	I've always been active; I feel personally responsible; my father always told me, etc.
Does conflict appear in their story of the issue? If so, do they describe any conflict resolution strategies?	Conflict/ conflict resolution	We had a showdown over when to lay baits; as a group we worked out a compromise
What are their visions of the future of this issue?	Future vision	No more sheep; no more wild dogs; climate change impacts etc.

Investigative queries	Code book	Examples
Narrative elements	Main protagonists; story start, middle, endings; tensions/conflict; resolutions; pathway/chronology	

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