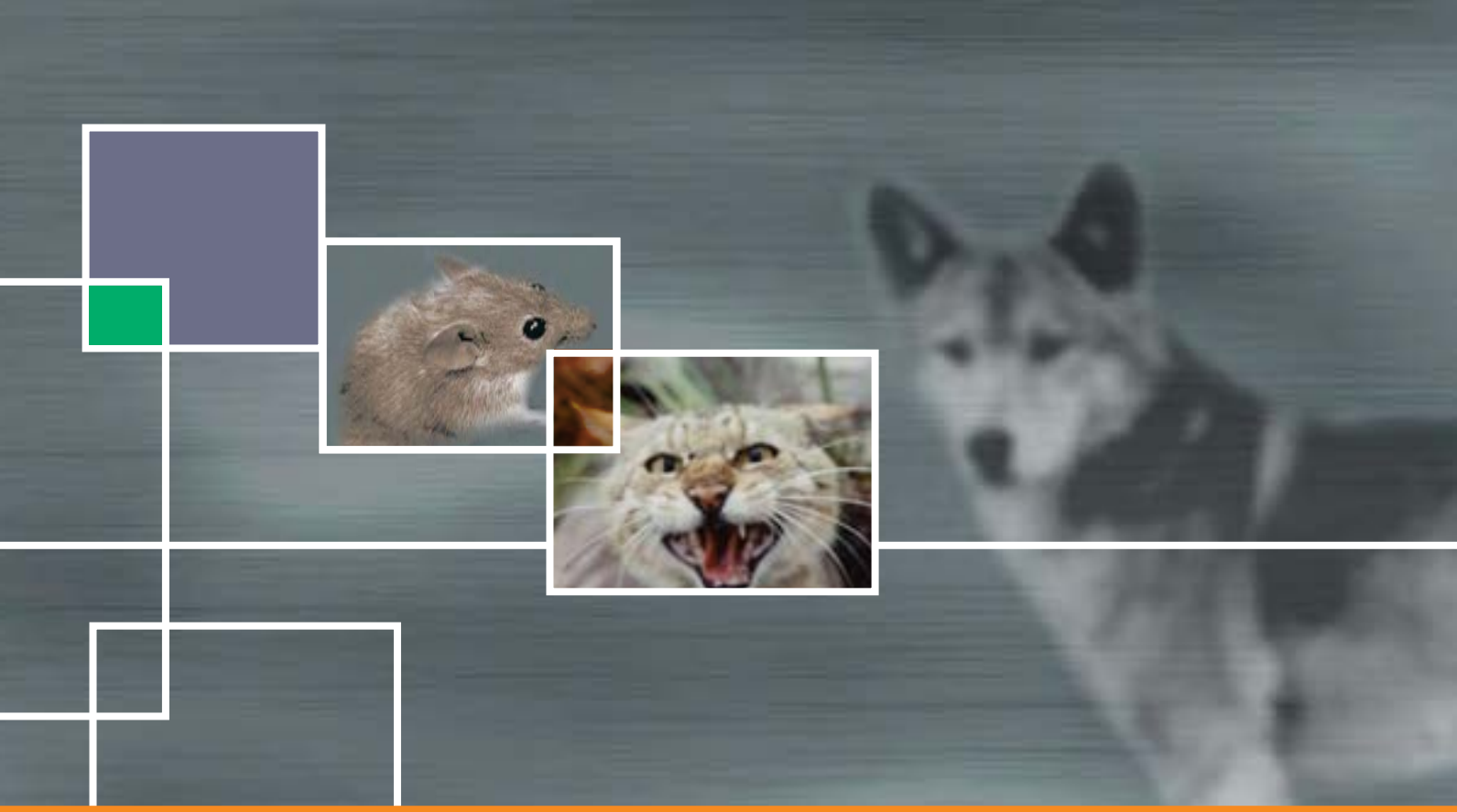

Social drivers of invasive animal control. Proceedings of the Invasive Animals CRC workshop on the social drivers of invasive animal control

26 – 27 July 2006, Tiffins on the Park, Adelaide

Invasive Animals CRC

Edited by Guy Ballard

Social drivers of invasive animal control.

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Summaries of presentations and discussions held at the Social Drivers of Invasive Animal Control Workshop are included in these proceedings. The reader is advised that, in some cases, the individual participants and organisations have not endorsed the summaries provided and interpretation of slides or transcripts may not be correct in those instances. Responsibility for the unendorsed content of this report, including any errors, is accepted by the Invasive Animals Cooperative Research Centre.

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Invasive Animals CRC

CRC AUSTRALIA

Contents

Workshop discussion and participant feedback

Introduction

Ecological and economic issues have traditionally dominated research and management of invasive species. However, in recent times there has been a growing acknowledgement of the social aspects, or 'human dimensions', of scenarios involving invasive animals. This realisation has been fuelled largely by the publication of 'Counting the Cost' (McLeod 2004), a triple-bottom-line assessment of invasive species' impacts on Australia. Commissioned by the Pest Animal CRC, that report highlighted both the relevance of social issues to Australian invasive species management and the fact that these are currently poorly understood.

In its new incarnation, the Invasive Animals CRC has made a commitment to understanding the social dimensions of invasive species management. Fortunately, the ideas of using social research and community involvement to improve the management of natural resources, particularly wildlife, are not new. More than 50 years ago King (1948) identified the need for a 'research program on man' to assist North America's game managers. Since then, a great deal of effort has been devoted to developing strategies that are inclusive of stakeholders' views on managing wildlife (Decker *et al*. 2001), including those species deemed to be 'nuisance', 'pests' or 'over-abundant' (e.g. Messmer *et al*. 1997; Peine 2001).

Some researchers and managers from Australia and New Zealand have made attempts to engage communities about invasive animals or to involve them to various extents in the management process (see Mitchell & Noble 1994; Salleras 1994; Prevett *et al*. 1996; Johnston & Marks 1997; Fraser 2001; Oliver & Walton 2004; Wilkinson & Fitzgerald 2005) but efforts such as these remain exceptions rather than the rule. Indeed, many managers seem to be either unsure of the specific benefits of engaging communities about management or, if otherwise convinced that such interaction is a good idea, are unaware of exactly how to go about it. In this regard, it seems clear that a lack of appropriate training for individuals involved in management (Baxter *et al*. 1999) and minimal exposure to social research practitioners are likely to be among the key limitations for adoption and application of social research to benefit invasive animal control.

Having recognised that many of the professionals involved with invasive species research and management are ill-equipped to identify and deal with the social issues that have relevance to their roles, the Invasive Animals CRC convened the workshop on 'Social Drivers of Invasive Animal Control'. Through this event, managers and scientists with traditional, biophysical training were given the chance interact with social researchers from a variety of natural resource management fields. Hopefully, the papers and transcripts within this document will make it clear to readers that that such an opportunity exposed the attendees to a broad range of social research concepts and methodologies, allowing discussion of their utility within a variety of invasive animal management scenarios.

Naturally, the workshop, and subsequently this publication, would not have been possible without the goodwill of the authors and other attendees. Through their contributions important steps were taken towards bridging the gap between traditional approaches and future use of community engagement and social research to significantly improve invasive animal control.

Guy Ballard

'Social Scientist'

Invasive Animals CRC

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Workshop Program

Wednesday 26th July, 2006

10:00 Welcome by Steven Lapidge, followed by morning tea

10:30 Descriptions of IA CRC Demonstration Sites, presented by site leaders

11:30 Mike Braysher

11:45 Nina Jenkins & Stephen Sarre

12:10 Gerard Fitzgerald and Roger Wilkinson

12:35 Lunch

13:30 Chrys Horn

13:50 Mark Fisher

14:20 Tessie Tumaneng-Diete

14:40 Kathryn Williams

15:10 David Russell

15:30 Afternoon Tea

16:00 Kelly Miller

16:20 Frank Vanclay

16:50 Tim Smith

17:10 Helen Cathles

17:40 Re-defining questions for Thursday discussions

19:00 Workshop Dinner

Thursday 27th July, 2006

09:00 Workshop Discussion: Session One

10:30 Morning tea

11:00 Workshop Discussion: Session Two

12:30 Lunch

13:30 Workshop Discussion: Session Three

15:00 Afternoon tea

15:30 Summary and Close

Demonstration Site Descriptions

Demonstration Site 10.U.1: Is there a mesopredator release effect from introduced predator control in WA?

Paul DeTores

Department of Environment and Conservation, Western Australia

Introduction

The Western Australian (WA) demonstration site is comprised of 4 sub-projects:

1. A rangelands site including the Australian Wildlife Conservancy's Mt Gibson property and two former pastoral leases now managed by DEC (Lochada and Karara) – 330,000ha;
2. The northern jarrah forest – 356,000ha;
3. Small reserves in a fragmented landscape within the WA wheatbelt – Dryandra and Tutanning – 17,000ha; and
4. Two large WA wheatbelt reserves – Lake Magenta and Dunn Rock – 170,000ha.

Aims

The WA demonstration site will involve:

- Examining the efficacy of cat control through use of the cat bait 'Eradicat' – currently a 1080 cat bait (not yet suitable for broad-scale use where there are non-target issues)
- Determining the way foxes and cats use the landscape (satellite telemetry)
- Determining whether or not cat abundance increases in the presence of fox control, or if cats simply become more visible in the landscape
- If there is an increase in cat abundance, following fox control, determining whether this leads to an increase in the level of predation by cats?
- Identifying the individual animals responsible for predation events (contact/proximity radio-telemetry) – i.e. are there 'rogue' individuals?
- Determining whether or not other predator species increase in abundance in the presence of fox control
- Determining whether or not reduction in fox density changes the total introduced and native predator diversity
- Should changes in the total introduced and native predator diversity occur, then identifying the biodiversity conservation implications of these changes
- Should changes in the total introduced and native predator diversity occur, then determining whether or not such changes are consistent at the different scales at which foxes are controlled, and whether or not these changes are consistent across biomes

Social research questions

- Is there a community perception that the end goal of invasive species management is reduction of the invasive species? That is, have we given the correct message?
- Is there a community perception that fox control is a panacea for fauna management problems?
- What are the community's expectations with regard to a management agency that has a charter for conservation management and provision of recreation opportunities?

Demonstration Site 10.U.2: Repel the Invaders: Kangaroo Island

Pip Masters

Kangaroo Island Natural Resource Management

Introduction

Kangaroo Island (KI) is nearly 40% bushland with a population of around 4500. It is a tourist destination but it is also has agriculture and forestry. There are no foxes on KI. This project is based around the eradication of deer, goats and possibly pigs. It is community driven and is backed by the KI Natural Resources Management. Cats are also a major problem on the island and have attracted significant community attention

Stakeholders

There are regional, national and international considerations for management on KI because it is a tourist destination. In terms of invasive species, regional and national levels are seen as being most important, with national being potentially more problematic than regional.

Impacts

We know about the community's perception of some issues, e.g. cats (from local surveys) but some actual impacts are relatively poorly understood. For example, there is a perception that cats are harmful because they transmit toxoplasmosis. Residents believed that this parasite was causing sheep abortions on KI however this has been disproved.

It is also interesting that there may be a difference in Rural and Urban perceptions of feral pigs on KI. Most urban people seem to think that pigs are not a big problem but anecdotal evidence suggests they may be the most hated animal on KI for many rural landholders.

The extent of invasive species' impacts on KI are summarised in Table 1.

Table 1 - Feral species' impacts on Kangaroo Island

Impact	Cats	Deer	Goats	Pigs, for urban people	Pigs, for rural people
Perceived	High	Low	Low – Medium	Low	High
Actual	Medium	Low	Medium	Low – Medium	High
Potential	Medium	High	Medium	Low – Medium	High

Social research

Pigs and goats may be the only species we consider from a social perspective. For example, it would be good to know the attitudes of farmers towards control versus eradication and to understand what type of management is acceptable from their perspective.

Demonstration Site 10.U.3: Supporting eradication of the fox from Tasmania

Stephen Sarre

Applied Ecology Research Group, University of Canberra

Introduction

The research team for this demonstration site includes the Tasmanian Department of Primary Industry and Water (including the Fox Free Tasmania Taskforce), the University of Western Australia and the University of Canberra.

A range of evidence exists for the presence of foxes in Tasmania:

- A fox that was shot was found to have endemic species in its stomach
- High quality sightings have occurred, including some by Fox Free Taskforce members
- Scats have been collected that are highly likely to be those of foxes
- Deaths of 3 lambs are likely to have been caused by foxes
- There has been confirmation of fox footprints
- Fox road-kills have occurred

Aims

The aim of the project is to identify/confirm the presence of foxes in Tasmania through the state-wide collection of predator scats by community groups. The collected scats will be analysed to identify genetic material from foxes (as distinct from other mammalian predators, e.g. Tasmanian devils, quolls, cats, dogs). This information will be used as a trigger for management action in Tasmania.

Social issues

- Media coverage suggests that there is substantial local interest in foxes
- The public will play an important role in sustaining/increasing government support for fox eradication
- The public will be directly involved through collection of scats
- So far there seems to be some community scepticism about the presence of foxes and there is clearly some individual antagonism towards the government
- It is also possible that some members of the community are involved in hoaxes that may impact the management of foxes in Tasmania

Social research questions

- Can the community group involvement decrease community scepticism?
- What is the social and economic cost of fox establishment in Tasmania?
- Can we estimate and/or ameliorate the risk of hoaxes in surveying for foxes?

Demonstration Site 10.U.4: Benefiting the biodiversity of East Gippsland through fox control

Alex Diment, PhD student[3]

Introduction

The Southern Ark demonstration site is located in Far East Gippsland. It's key objective is to recover and restore the native wildlife of East Gippsland by creating extensive tracts of habitat in which populations of introduced Red Foxes (*Vulpes vulpes*) are substantially reduced. At the same time, Southern Ark has a communication aim of promoting the substantial environmental, economic and social benefits that can be achieved through the control of Red Foxes in East Gippsland and the specific contributions of Southern Ark.

Identified stakeholders in the Southern Ark project include:

- Local Residents and Visitors
- Wider Community, Stakeholder Groups
- Agencies Participating in the Project
- Minister(s)
- Media
- Volunteers/NGOs

A variety of tools (signage, web, newsletters) have been designed and implemented to engage with stakeholders and increase their support of the program. Community engagement is directed by the comprehensive 'Southern Ark Community Engagement Plan'.

Social Impacts

- Negatives (foxes): Concern for public land stewardship and loss of native species, stress through losses in sheep production areas on private land
- Positive indicator (fox control): Surprise at seeing native animals in tourist campgrounds

Social research

Potential social research questions associated with the Southern Ark project include:

- How much participation is there by the private landholder community? e.g. What percentage of these people would regularly service a bait station?
- What are the barriers to behavioural change re: uptake of new baiting techniques and/or products?
- Is there geographic (regional) variation in views and/or practices of the landholder community re: cost-benefit/effectiveness/implementation of control techniques?
- What is the social cost of wild dog attacks on livestock?
- To what extent will the public accept 'collateral damage' to populations of wildlife / domestic animals from management programs?
- To what extent is humaneness/animal welfare an issue for the community when managing populations of pest animals?
- Social reactions to non-participants (e.g. why should non-participant neighbours benefit from investment in pest animal control. Should they be sent an invoice?)
- What proportion of the population believes that 'the way Grandpa did it' is still the optimal technique for managing pests?
- Considering how knowledge about pests is disseminated, what opportunities there are for influencing stakeholder's views?

3 For Gordon Friend, Department of Sustainability and Environment, Victoria.

Demonstration Site 10.U.5: A strategic approach to wild dog management

Peter Fleming,

NSW Department of Primary Industries

Introduction

The site spans the region between the coast and Tamworth (NSW), from Warwick (Qld) in the north, south to Scone in NSW. The main objective is to demonstrate the benefits of a strategic approach to wild-dog and fox control. This will include the use of a nil-tenure approach, where appropriate.

Groups participating in the project include:

- 5 Rural Lands Protection Boards (RLPB's)
- NSW DPI: Forests, Agriculture
- NSW DEC
- NSW Farmers
- Local wild dog control organisations
- Aust Hydatid Control & Epidemiology Program
- Qld NRM & W
- Pestat Ltd

Other stakeholders in the project include:

- Livestock producers
- Government land managers
- Landholders without stock
- Townspeople
- Dingo-interest groups
- People who rely on agricultural products from these areas, e.g. 'food-eaters' and 'wool-wearers'

Social Impacts

Impacts caused by wild-dogs and foxes operate at different levels.

At an individual level, issues include:

- Distress at livestock injury
- Psychological trauma
- Stress on family relationship
- Social retreat and dislocation
- Financial underperformance consequences

At a community level, issues include:

- Lack of understanding (real or perceived)
- Antagonism between affected & unaffected members

At the wider society level, issues include:

- Disinterest
- Sympathy
- Disassociation
- Antagonism

Social Research

- Investigation of stakeholder attitudes toward wild dogs and their control
- PhD study of social aspects of wild dog control

Demonstration Site 10.U.6: Feral Pig Management in the Wet Tropics, North Queensland

Carla Meurk, PhD Student[2]

Introduction

The Wet Tropics of North Queensland contains ecologically significant rainforest including the Daintree rainforest which is a registered World Heritage Site as well as sugar cane and banana plantations. In economic terms, eco-tourism, as well as sugar cane and banana farming, are important industries in this area.

Currently, live trapping and hunting are the main methods of feral pig control in this area. There is a local aversion to poisoning, particularly in the World Heritage Area, largely due to concern over non-target impacts. Additionally, live trapping is considered to be an effective control by some members of the community. From a scientific perspective poisoning is considered an important, if not the only, long term solution. This is likely to be true in terms of cost and efficacy of pig control.

Social Environment

The Wet Tropics contains many different groups including indigenous communities, farmers, 'alternative lifestylers', those involved with the tourism industry as well as service groups. In addition, the high profile of the World Heritage Area, home to the endangered Cassowary means that there is urban and perhaps international interest in this area. There are divisions in the community on a number of issues, both historic and contemporary, and this extends beyond issues of feral pigs and their management.

Social Research – PhD study

The PhD study based at this demonstration site currently has two major interests. These are:

- Understanding conflicts surrounding feral pigs and their management, but also putting these in a wider socio-cultural context. This may lead to the development of multiple requirements management models which incorporate differences rather than attempting to force consensus where it may not be feasible.
- Understanding the drivers of groups which take direct action, for example vandalism or the use of the media to mobilise popular support against certain regimes. These actions can be costly, and pose a substantial barrier to successful pest management. Understanding these groups may help draw them into the management process or, in some cases allow for the development of management strategies which lessen the impacts.[3]

2 For Iain Gordon, CSIRO – Davies Laboratory, QLD

Demonstration Site 10.U.7: Targeted carp control options for the Lower Lachlan Catchment

Guy Ballard[3]

Invasive Animals CRC

Introduction

This project is situated in the Lower Lachlan Catchment (southern central NSW) where there is significant carp problem. A comparison of catch per unit effort across NSW inland rivers showed the Lachlan to have the highest levels (~70 fish per hour from electro-fishing).

The project has a range of stakeholders, including:

- NSW Department of Primary Industries
- Lachlan Catchment Management Authority (responsible for community engagement)
- South Australian Research and Development Institute
- K. & C. Fisheries Global Pty Ltd
- Victorian Department of Sustainability and Environment (Arthur Rylah Institute)
- NSW State Water Corporation
- Murray-Darling Basin Commission
- The Lachlan Valley Community

Aims

The project aims to benchmark the following bio-physical properties:

- Size of the carp population
- Recruitment from each hotspot within the catchment
- Water quality
- Bank Stability
- Aquatic vegetation
- Native fish

Social research

Community participation is seen as an important part of implementing this project, for example:

- Recreational harvest through community fishing competitions
- Community assistance in clearing traps

There is also interest in attempting to understand some 'human dimensions' of local issues, for example:

- The quality of the recreational fishery
- Community perceptions of carp
- Acceptance of likely changes in the distribution and abundance of carp over time
- Community perceptions of the associated local environment
- Acceptance of likely changes in the local environment, associated with control of carp, e.g. will residents accept likely increases in aquatic vegetation? If not, what does this mean for management?

3 For Dean Gilligan, NSW Department of Primary Industries

Demonstration Site 10.U.8: Carp control in the Logan and Albert Rivers

Andrew Norris,

Queensland Department of Primary Industries & Fisheries

Introduction

The Logan-Albert Catchment is located on triangle that borders Brisbane, the Gold-Coast and NSW. The two rivers run relatively parallel to each other and are approximately 150km in length. The catchment spans a range of bio-physical, social and economic conditions including pristine upper-reaches to a degraded downstream across rural, semi-rural and industrial areas.

This demonstration site is looking at community engagement and community involvement in the control of carp on a catchment-wide scale. We are keen to see how we can use community efforts in controlling pest fish

The demonstration site was instigated due to pressure from Carpbusters, a local community group (formed from a local fishing club) that run annual, large-scale fishing competitions (past 7 years). These events attract substantial attention, via television, radio and print media, lots of media and can have as many as 2000 participants. We would like to know how effective these competitions are in directly reducing the impact of carp on the catchment. Alternatively, are they simply a good community engagement exercise?

Interestingly, the Carpbusters' motivation for involvement is raising money for restocking native fish, rather than removing carp from the system. They are essentially a self-interest group.

The broader community has a widespread hatred for carp as there is a widely held view that they are doing damage to native fish, riparian vegetation and aquatic ecosystems generally. There is also the view that carp are having a significant impact on local recreational fishing – which is also interesting as there is no scientific evidence of such an effect

Social research

Questions of interest include:

- What drives participation in Carpbuster competitions?
- Why do only some members of fishing clubs take part?
- What is the general knowledge level regarding carp and other fish?

Ideally, this project aims to benchmark public knowledge at the outset and, if necessary, see if community engagement programs are effective in producing positive changes.

Workshop Papers

Natural Heritage Trust Project on PESTPLAN

Mike Braysher

Institute for Applied Ecology, University of Canberra.

The Invasive Animals Cooperative Research Centre is developing a course to train relevant individuals to work with local and regional groups to help them identify their pest animal issues and plans to manage them[4]. The project is to run for three years, the first year will focus primarily on determining the key issues associated with developing effective plans and ensure that the course will appropriately addresses these issues. Once developed a number of individuals run through a pilot course to test it.

The long term aim is to have a training course that can provide key target individuals with the necessary skills to undertake strategic planning for managing pest animal damage and to develop and oversee the implementation of effective plans.

The target audience for the course is those persons and agencies responsible for planning and assisting with the implementation of pest animal management across Australia. For NSW it would be the NSW DPI Agriculture Protection Officers, relevant officers within the Catchment Management Authorities, senior Rural Land Protection Board rangers, senior NPWS and State Forest rangers and others who might want to develop these skills.

The course will be based on PESTPLAN (Braysher & Saunders 2003), a decision support tool that was developed to assist groups to identify their pest management problems and to develop and implement local and regional plans to address the damage that pests cause. PESTPLAN helps by asking a structured series of questions and by raising issues to be considered about pests and the problems that they cause. It is based on several principles including:

- Recognition that pests are one of many factors that influence sustainable resource management.
- The focus is on the outcomes from managing pests, not just on killing pests. Desired outcomes may be:
  - Increased primary production;
  - Recovery of native wildlife populations; and/or
  - More peace of mind from knowing that the pest is not destroying livestock.
- Recognition that eradication (the permanent removal of every last individual pest) is rarely possible.
- That the options for management are mainly containment, sustained action or no management.
- That effective management of damage due to pests usually requires ongoing coordinated action across a range of land tenures.

PESTPLAN has been used to develop several pest management projects in Australia. Some have been very effective, others less so. The following are some lessons that I have determined based on experience and observation from developing several projects, using the PESTPLAN process:

- Ideally there should be a passion for pest management with a core group that are willing to drive the process and undertake pre-planning; and good background information available.
- It is essential to be clear about what the community wants from pest control because this will shape the strategy to be taken. For example does the community want:
  - Increased density of native wildlife?
  - Increased production?

4 See Sarre and Jenkins in this publication

  - Employment, e.g. in indigenous communities?
  - Fewer pest animals because they are disliked?
- Local ownership and commitment to action is essential. Without a local group that is willing to take on the responsibility for developing and implementing the program, success is unlikely. If it is not present, then it needs to be fostered before serious planning is started.
- Avoid generating false expectations. If expectations are generated then not met, it can be difficult to engage the group on future projects.
- Most people are 'workshopped out'. Be clear why you are bringing the group together and be sure that follow up action is likely.
- Poor planning risks losing key players. Do your homework to ensure that you have a good understanding of the issues and constraints and who the key decision makers are.
- A core group needs to understand the problem and the associated issues and have sufficient commitment to bring others on board. Working through a core trusted group helps to give credibility to you and the planning process.
- Don't start until the group is ready. It may take several months or even years before the group is ready to seriously engage in addressing the pest management issue.
- Where possible build on existing groups and work, e.g. Landcare, salinity, weed control. Don't reinvent the wheel.
- Ensure key players are involved:
  - Decision makers.
  - Those controlling purse strings.
  - Strong critics as well as supporters. Failure to engage a key critic may have them criticizing the process through the media or to funding bodies. Better to have them in the process and hear and discuss their views.
- A professional facilitator can be crucial to the outcome. Not only do they have the skills to deal with personal conflicts; unlike you, they can be seen to be impartial.
- Start with bite-sized areas. It is sometimes difficult for groups to get their heads around addressing the pest and personality issues associated with very large chunks of land, at least initially.
- Don't spread resources too thinly – consolidate and then progress. Otherwise you may find yourself 'fire-fighting' to quell issues rather than concentrating on addressing the pest management problem.
- If the project is large include a coordinator for the project. Too often coordination is tacked onto other duties and it is often the first task to fall off when the pressure is on.
- Make sure that there is a process to replace or rest key people. Individuals will leave the group, especially government employees who can be transferred to other regions.
- Provide regular and open feedback to keep people informed/engaged. This should happen:
  - During planning and implementation
  - To share results and success
- Regularly celebrate successes. This may be as simple as an article in the monthly newsletter, a group BBQ or a simple award for good effort.

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Braysher, M. & Saunders G. (2003) *'PESTPLAN – A guide to setting priorities and developing a management plan for pest animals.'* Natural Heritage Trust, Commonwealth of Australia, Canberra.

IACRC Education Program: Stakeholders to Postgraduates

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Introduction

The CRC Education Program is aimed at ensuring that stakeholders at all levels in the community benefit from advances in pest animal management and control technologies. We aim to deliver appropriate pest animal education tailored for a diverse range of social groups. To achieve this, two areas of focus have been identified and will be addressed as follows:

1. Stakeholder training through the development of courses in strategic pest management for practitioners working in natural resource management, and public education and information provision through the pest animal website (www.feral.org.au).
2. Provision of a comprehensive training and development program for CRC postgraduate students.

Although these focus areas will be addressed through separate initiatives, they will be linked within the Education Program and outputs will cross-fertilise between the groups. In this way, the Education Program aims to align itself with social drivers of invasive animal control by bringing together research, industry and stakeholders with the overall objective of improving the future management of invasive animals.

Stakeholder training

Education Program activities in this area provide training, information and awareness raising at all levels from school children through field operatives to land and environmental managers. Three projects are currently underway to address these training and development needs.

1. A joint IACRC and NHT funded 'Pest Animal Website' project aims to increase the comprehensiveness and functions of the www.feral.org website to include public and curriculum based school education on pest animals.
2. NSW Department of Primary Industries (DPI) have CRC project funding to develop Certificate in Conservation and Land Management (CLM) training programs. This DPI-CLM project will review and develop the content and relevance of the CLM training package (for vertebrate pests) at levels II-IV for field staff and employers.
3. A joint IACRC and NHT funded PESTPLAN project will develop higher Level (V-VI) units in CLM to train managers in cooperative, strategic pest management planning.

Pest Animal Website

The Pest Animal Website (www.feral.org.au) and associated activities are supported jointly by NHT and IACRC Education Program funds. The website currently covers an immense diversity, range and amount of information on pest animals, including pest fish as well as policy, management and educational information that previously has been relatively inaccessible. The site includes an extensive list of reports and publications with an emphasis on the hard-to-access grey literature. The Pest Animal Website project will enable us to increase the quality, comprehensiveness, and usability of the site but most critically, to increase the outreach of the site through the development of educational programs and resources and that will link Australian schools and training institutions to the information and training that is central to the management of Australia's feral animals.

Stakeholders for the outputs and outcomes of the project represent the full range of groups and individuals concerned with pest animals and their management. They include policy developers, researchers, planners, educationists, on-ground managers (including individual land managers), those concerned with animal welfare, schools and the general public. Many groups have become aware and involved in the website through the initial development. Under the new initiative, there will be greater emphasis on involving the Vertebrate Pests Committee (VPC), agencies, schools and other educational institutions to determine their resource needs. These groups will be engaged through a variety of means including:

- Direct contact through relevant agencies and groups such as state and national primary and secondary school curriculum bodies, state and territory primary production organisations and state and territory nature conservation agencies (both government and community);
- At relevant forums such as field days, relevant conferences, National Science Festival; and
- Liaison with the National VPC.

Following a consultation process, a series of web-based and hard-copy resource materials will be developed to support the extension program. These materials will vary according to the groups targeted but could include teaching aides, resource materials and strategies (such as competitions) for engaging new users.

The Pest Animal Website has been, and will continue to be, widely promoted through various forums including relevant conferences and the Australian Science Festival and has been extensively accessed by a variety of groups and individuals.

Conservation and Land Management Training Packages

Both the DPI-CLM project and the PESTPLAN project involve the development and implementation of training courses that will be accredited through the Australian Qualifications Framework (AQF).

The AQF is made up of defined training packages that have been developed across all sectors. Vertebrate pest management is contained within the CLM training package and is administered by the Rural Training Council of Australia (RTCA).

The CLM training package spans six levels of post compulsory education. The IACRC education program will address training across these levels. The first project addresses levels II-IV and is currently under development by Peter Fleming & Rob Williams (NSW DPI). Training will cover practical aspects of pest animal control and certification will be awarded through Tocal College. It is anticipated that graduates from the level IV course and those assessed as Level IV or above through recognition of prior learning will feed into the higher level course.

The Diploma (Level V) and advanced Diploma (Level VI) will be addressed by a joint NHT and IACRC funded project to develop a training course in strategic pest management based on the PESTPLAN* process. The objective of this course is to equip key personnel working in land management with the skills and processes to develop a coordinated and community owned pest management strategy for key vertebrate pests in areas where effective management is required for production and/or conservation reasons.

The likely target audience for the Diploma and higher level courses will be land management professionals such as NSW Department of Primary Industry APOs, Senior Rural Lands Protection Boards Rangers, CMA/NRM planners, Senior NSW National Parks and Wildlife Services Rangers, Senior NSW Forests Ranger, water catchment planners, Indigenous Land Councils etc.

* See Braysher in this publication

Course material for Level V and above does not currently exist, but will be developed by the PESTPLAN project and delivered via a combination of web-based packages, short-course attendance, practical workshop experience and recognition of prior learning. A selection of core subject areas will be compulsory.

As an initial data gathering exercise, a number of case studies focusing on existing successful co-operative strategic pest management plans/programs are being undertaken. The majority of these plans were initiated using the PESTPLAN process and the project aims to identify the common successful elements in these plans and to note difficulties and any shortcomings. Case studies are being conducted on:

- Brindabella-Wee Jasper Wild Dog project.
- South Coast Shore Bird Management Project
- Goonoo (NSW) fox management project
- West Coast Integrated Pest Program SA

To ensure the course is nationally relevant, information on pest animal management planning and policy will be obtained across State NRM regions,

As part of the course development process, the project also aims to work with at least two regional groups to set up a cooperative strategic planning process for key pests from initial contact and discussion with the key stakeholders in the area, through the running of a PESTPLAN workshop to the successful implementation of the pest management strategy. This activity will allow complete documentation of the development of a pest animal management plan and provide key course material from a real-life planning process.

Although the course aims to produce graduates with the suite of skills necessary to deal with the diverse issues involved in pest animal management. The specified units identified within the CLM training package do not address vital social skills. We consider that these elements are essential for the successful initiation and implementation of a community owned strategic pest management plan. Consequently, a key element of our course development will be to address the importance of these skills and include training in facilitation, conflict resolution, negotiation skills, communication with community groups and community engagement and empowerment.

It is envisaged that the first ‘pilot’ course will be run in 2008 with a small group of sponsored students from a range of locations and working backgrounds. Each student should graduate with the ability to identify areas within their region where a strategic pest animal management plan has a good chance of success and to be able to coordinate and drive that plan to implementation.

Postgraduate training and development

Through the provision of a comprehensive training and development program for CRC postgraduate students, we aim to turn out highly skilled graduates with a broad knowledge of pest management issues and experience in industry settings relevant to their area of expertise. We aim to produce graduates that can move between industry and academia, providing the vital links between these critical components of Australasian infrastructure.

Traditional PhD programs aim to have students learn to conceive, plan and carry to completion a substantial piece of original research in a specialized area of academic study, under the supervision of a professional in the field. In so doing, the candidate is expected to extend their chosen field of study by contributing to knowledge in that field or by reworking existing knowledge to provide new insights.

An additional central objective of the program proposed by the IA CRC is to prepare graduates for leadership roles in the industry by providing leadership, management, business and entrepreneurial skills in addition to the sound research training designed to improve the knowledge base upon which those decisions rest. These additional educational opportunities are accommodated by funding students into a fourth year of study.

In this way, PhD graduates emerging from the CRC will be fully equipped with the knowledge and skills to take up key positions in research and industry. These individuals are likely to become key players in the future of pest animal management and their training program will prepare them for this challenge.

Conclusion

The activities of the IACRC Education program will have a positive social impact across all community levels. Through our postgraduate training and development program we will turn out individuals with leadership and teambuilding skills and the ability to either provide the link between research and the pest animal industry or to take up managerial roles within the industry. These individuals are likely to become our future policymakers. The development of CLM courses will enable us to build capacity within the agencies responsible for pest management. Levels II-IV will provide practical and organisational skills required for pest and implementation and enhance adoption of new IA CRC strategies and products. At Level V-VI, training will build capacity to work with local communities and assist them to identify and manage their pest animal problems in a collaborative and strategic fashion.

Schools, communities and practitioners will all benefit from the updated pest animal website. The provision of comprehensive information on pest animals and their management will build capacity and knowledge of strategic pest management and provide an information resource for all stakeholders.

Presentation Summary based on: People and pest control in New Zealand

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Previous social research on animal pests and their control in New Zealand by Fitzgerald and Wilkinson

1994: Stakeholder and public perceptions and issues in possum management

1996: Stakeholder and public attitudes to rabbits and calici virus

2000 - 2001: Stakeholder and public attitudes to possum controls, including fertility control

2001 - 2002: Social acceptability of stoats and stoat controls

The Pests

1. Possums (*Trichosurus vulpecula)*:

Introduced to NZ, to create a fur trade, in the 1830's

No native predators in NZ

Major threat to both indigenous flora

Threaten animal health as they are a vector for Bovine Tuberculosis

2. Rabbits (*Oryctolagus cuniculus*):

Introduced to NZ in the early 1800's

No native NZ predators

Threaten agriculture via grazing and land disturbance

3. Stoats (*Mustela erminea*):

Introduced to NZ in the 1800's as a biocontrol for rabbits

No native predators in NZ

Threaten indigenous birds via predation

Research methodology

Qualitative and quantitative research was designed to inform national and regional decision making

Focus groups were used to identify and describe the range of views and constructions around:

- the animals
- the 'problem'
- the solution/s, and
- control technologies

Interview-based surveys were used to identify and quantify:

- how widely the views were held
- prevalence of constructions

Perceptions of pests and their control

Rabbits, possums and stoats were primarily seen as environmental/biodiversity threats

These animals should be 'controlled'

'No control' was the least acceptable control option

The impacts of these animals should be managed to achieve the following:

- Protection of native birds
- Immunisation of possums against Bovine Tuberculosis

Improved pest controls are needed

The aim of pest control efforts

Views differed on what the aims of control should be:

- Reducing pest populations
- Restricting geographical spread
- Total eradication

Some people also wanted social & economic benefits from pest control efforts, such as:

- Employment
- Fur and fibre production
- Game food products

The things New Zealanders require of a pest control for it to be acceptable

Specific – 'Not affecting any species other than target animal'

Effective – In reducing the numbers of the pest animal

Humane – 'The individual animal does not suffer'. Also referred to as a 'quick' or 'clean' death

Affordable – Including 'not causing the taxpayer any additional cost', 'cheap', and/or 'economical'

Not require a vector organism

Plus it should:

- Be controllable/extinguishable
- Be sustainable
- Be thoroughly researched & tested before use or release
- Have multiple benefits
- Have foreseen & known risks

Involving Communities in Animal Pest Control

Chrys Horn

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Background: Collaborative Learning for Environmental Management

I am part of a small team at Landcare Research that calls itself Collaborative Learning for Environmental Management (CLEM). The work of the CLEM group focuses on how we can work towards facilitating change in the social system in question.

Our existence arises from the need to get science used better in policy and on-the-ground management of natural and urban ecosystems. When science is being used, a lot of learning is required. People have to learn first *about* the science and then how to change either *what* they do or *how* they do it and ideally to *evaluate* the results and *learn* from that as well. In all our work, it is not a case of individuals doing the learning but of groups of people with different backgrounds and experience working together to understand and act in complex socio-ecological systems.

Likewise, to get our science taken up requires us to learn about our stakeholders and to learn from our work with them. Generally, to get science used, both the science and the management groups must be able to work together and integrate their different kinds of knowledge. This work therefore utilises work from the fields of extension, information management, adult education, group processes, multi-stakeholder processes, transdisciplinarity/integrated research models, collaboration, social learning, social marketing, behaviour change, environmental management, and conflict management.

What Motivates People to Undertake Pest Control?

At the most basic level, people will be motivated to achieve successful pest control if those pests interfere with something they value. This might include an interest in fostering birdlife, or protecting indigenous biodiversity. In New Zealand, another strong motivator for many farmers is the desire to eradicate tuberculosis (Tb) from farm animals, which requires the control of possums and perhaps ferrets both on farms and in surrounding tracts of bush. The value at stake here is farm profitability since Tb makes it difficult to export farm produce. An example of groups becoming motivated to undertake pest control is provided in Box 1.

Box 1 - Example of values that motivate people to undertake pest control activities

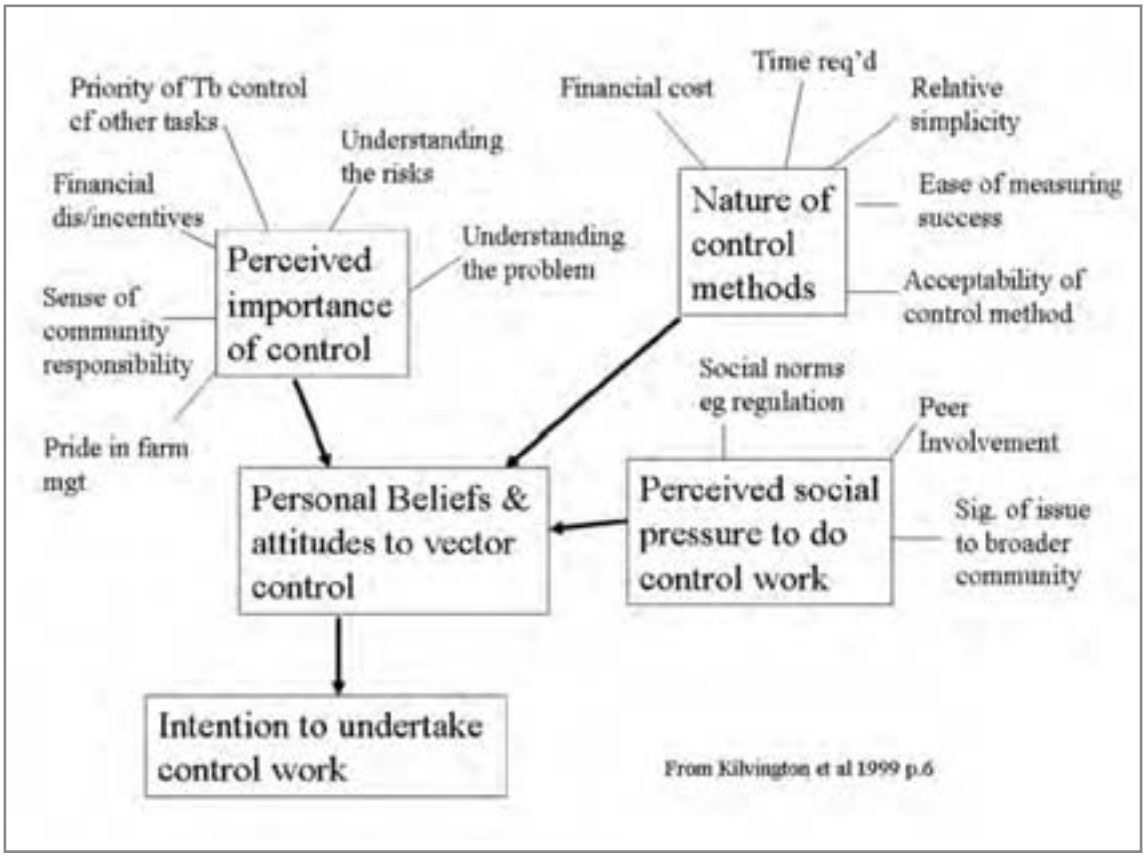
The group Kaupapa Kereru began when an influential individual from one of the Ngai Tahu Rūnanga on Banks Peninsula became concerned at the decreasing number of kererū (native wood pigeons) and wanted to see kererū in large numbers on the Peninsula. Other Māori on the Peninsula have a strong interest in restoring traditional 'mahinga kai' or food resources and as a step towards that they want to see kererū reach such high numbers as to be seen as pests (!). Researchers and agency staff are also interested in kererū and in increasing their numbers because they are an important part of the natural ecosystems of New Zealand being the only bird capable of spreading large seeds. The kererū, therefore, is a bird valued for a number of different (and sometimes conflicting) reasons. However, the group's immediate goals, to understand kererū ecology in a fragmented landscape and to work towards increasing their numbers, provide the means to work together and agree at least that the bird itself is valuable.

Continued over

The Banks Peninsula Conservation Trust is a group largely comprised of farmers, retired farmers, and local residents. They work with farmers to gently encourage and facilitate actions to preserve areas of natural significance. They now have several people with covenants on their native bush and have helped a number of farmers fence off their bush to keep stock out. They have also worked hard on getting rid of feral goats in the area and maintain links with other groups and agencies involved in pest control work. Their work is motivated by an interest in protecting native biodiversity on Banks Peninsula and also by a desire to move away from the use of legal processes to foster that protection. They noted at a review meeting recently that they have had no success with approaching farmers about protecting bush. Success has come instead from publicising and profiling who they are, what their work involves and the options available, and encouraging interested farmers to come to them.

As the example above indicates, motivation can have a number of different aspects to it. Motivations for the same action may be based on very different values. According to Kilvington *et al*. (1999), intention to undertake pest control for the purposes of controlling Tb is influenced by a wide range of motivators. These may be associated with perceptions about the importance of control, the nature of the control methods, and the social pressure to do pest control. These different aspects of intention are in turn influenced by a range of factors (summarised in Fig. 1).

Figure 1 - Factors influencing farmer intention to undertake pest control (Kilvington* et al *1999, p.6).



However, to get people undertaking pest control, when they haven't yet done so, requires a process of changing what people do. Certainly, people have to have positive intentions to change what they do, but positive intentions are not in themselves enough to develop action on the ground (Ajzen 1991; Ross & Nisbett 1991). As psychologists have noted for at least 35 years, positive attitudes do not necessarily result in the behaviours that might be expected. Health researchers, for example, have noted that while many people agree that they should give up smoking, that exercise is a good idea, or that we should all be eating better (to name but three examples), they do not necessarily give up smoking, or start exercising regularly or eat well. So there is more to achieving action than simply 'selling' people the idea that something is good.

Effecting Action

Effective action comes from:

- Knowing what to do,
- Knowing how to do it, and
- Knowing how to manage the social and psychological barriers to doing it.

Box 2 provides an example of the kinds of issues that arise when someone decides that they should eat better food (something with which we probably all have some familiarity).

Box 2 - Factors that might affect someone's intention to eat better

Fred wants to eat better. He has been convinced by his doctor, by something he read, something he saw on TV, and/or by the fact that he is not feeling well, that he should eat better, so he has a positive intention towards eating better. To do this, however, he needs to learn:

- What eating better means and what it means specifically for Fred:
  - Does 'better' mean gluten free or dairy free or meat free (as it does for some) or does it mean eating more vegetables or does it mean eating less overall?
- What the research on the topic says and how that continues to change:
  - Should it be 'fat free' or is it about the right kinds of fat?
  - 'Is sugar okay?' and 'How much is okay?' and 'How much is not?'
- About the food itself, where it comes from and how it is grown or processed – what food contains the things he wants to eat and which foods contain stuff he wants to avoid?

There is a lot of learning to do about eating better, about where to get information, and about whether that information is reliable or not.

Supposing Fred is confident about what he should be eating; he now needs to know *how* to do that. He might need to learn:

- Some new recipes,
- How to use new ingredients,
- How to locate new unfamiliar foods or ingredients,
- Which restaurants to go to,
- Which foods he likes and which he really doesn't and which he could grow to like with practice.

Fred might also need to work out how to find some kind of social support – e.g. the encouragement of his partner or someone else trying the same things with whom he can compare notes.

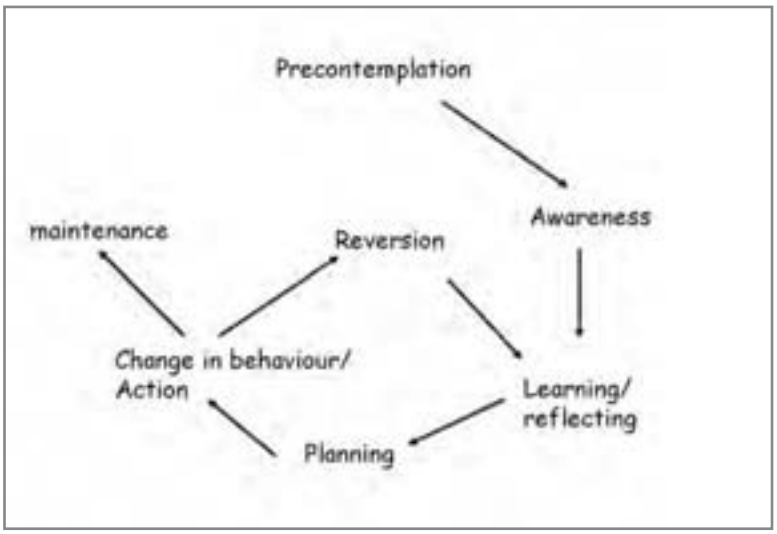
Continued over

At the same time Fred has to learn about the social and psychological barriers to establishing new eating patterns. So for example:

- Does his favourite lunch bar stock appropriate foods in combinations that he likes? How amenable are his family or flatmates to eating in new ways?
- How is he going to manage eating with friends who are used to cooking for him or eating with him in particular situations in the old ways?
- How will he manage situations where he is provided with food he does not want to eat, when he is hungry?
- How will he get feedback to help keep himself motivated?
- How does he manage those nights when he doesn't want to cook?
- How will he find the time in his busy schedule to do the learning he needs to do to manage all this?
- How will he react to the feeling of failure when he eats something that he shouldn't?
- How will he keep motivated to work through this jungle of problems?!

All of these situations require ongoing learning and reflection; very often they involve failing and then starting again. This points to the idea that behaviour change and learning are not linear processes but instead are iterative (Parnell & Benton 1999). Parnell and Benton (1999) suggest a number of stages that people go through in the process of changing practice (Fig. 2).

Figure 2 – The behaviour change process (adapted from Parnell & Benton 1999)



The implications of this are twofold. Any actions aimed at helping others change must take account of people's different needs at these different stages of change. There may be times when they need encouragement to continue, when they need help with the technicalities of how to undertake pest control or how to manage a group of volunteers who are working on the project. There may be times when they need help negotiating an institutional barrier. Box 3 outlines an example of how one community worked to manage animal pest control.

Box 3 - Successful pest control in the Waikato

A successful scheme that was run up in the Waikato region of New Zealand took account of many of these things. Farmers were motivated to do something to protect the native bush in their area. People were used to seeing the bush looking healthy as a result of low possum numbers, it having been under Animal Health Board control for years. However, when the Tb-related control came off and possum numbers increased, there was concern about the damage the animals were doing.

The regional council took a self-help approach and instead of employing contractors to do the pest control work, they employed contractors to help the farmers with pest control work. According to the pest contractor doing this work, their approach had a number of aspects.

1. Facilitators rang farmers regularly to see how they were going. This helped keep up motivation levels and reminded farmers of their responsibilities while also providing the opportunity for information to go both ways.
2. Facilitators went out and visited farms once or twice a year. When they visited they went out with the farmer to look at baiting sites and the ways in which bait stations and traps were set up. The facilitators observed that farmers did have quite a lot to learn about putting out effective bait station lines. The farmers observed that their baiting efforts became more effective for the same level of effort.
3. Contractors then measured the effectiveness of the control activities to provide feedback for the community members involved in the work (which again helped keep up motivation). Feedback was also provided when the bush recovered.
4. Regular get-togethers were held with all involved to exchange information and ascertain progress and keep everyone aware of the community-wide interest in controlling pests.

Rumour has it that after a couple of years, farmers have opted to pay rates to cover the cost of having a contractor do the work, something they had objected to before the scheme went ahead. A further facilitating aspect was the provision of poison and bait stations by the regional council.

This example illustrates a number of facilitators in operation. This work provided participants with encouragement and reminders about the importance of the work, it kept people motivated by providing feedback in the form of measurements of possum densities, and it encouraged learning – both directly from the contractors and from other farmers attempting to do similar work in similar conditions. Farmers involved in this process also felt that the contractors learned a great deal about the farming year and how best to work with them.

Social and Institutional Barriers and Facilitators for Achieving Successful Pest Control

In New Zealand, much pest control work is done by means of aerial application of 1080. These operations can be impeded by community action aimed at stopping them.

The work in the possum biocontrol program, which involves factors such as genetic modification, has led me into the arena of science and society/social aspects of biotechnology. Many of the principles are similar. For this part of the discussion, I draw on Horn and Kilvington (2003), and Lyver *et al*. (2004, 2006) as well as on unpublished work with community groups.

Horn and Kilvington (2003) carried out a small study in which we talked with people involved in working with Māori communities facing 1080 drops. We were particularly interested in situations in which 1080 was used with the blessing of that community. In this, we spoke both to agency staff and to Māori groups in whose area the work was completed. Lyver *et al*. (2004, 2006) document a series of dialogue-based workshops in which the focus was on biosecurity-related issues (importing weed biocontrol agents, the use of 1080 in animal pest control over large tracts of land).

As it turned out, communities were more positive about pest control and the use of 1080 when they had the opportunity to learn about the different aspects of using these techniques in a way and at a pace that suited them. Horn and Kilvington (2003) found that successful operations involved skilled communicators who went out to work with the communities on how to get rid of possums rather than to persuade them that dropping 1080 was a good course of action. Lyver *et al*. (2004, 2006) found that a surprising level of agreement on how to move forward was reached in dialogue forums in which different groups with very different opinions and attitudes were brought together in a well-facilitated process. There are six critical aspects to this.

1. Working on the question of how to control pests gives participants a reason to look into the subject and engage with the wide range of information available and, often, to reach similar conclusions to those reached by agency staff, albeit with a few important differences. Where agencies go out with the answer already worked out and aim to persuade a community to fit in with that plan, the community tends to engage mainly with information that might provide a case against what the agency wants to do.

2. The process of building trust is key, and to do this it is important for *all* in the process to get to know each other as people worthy of respect and with many values in common.

3. Persuasion builds distrust where trust does not already exist. Most of those with the knowledge will automatically (and naturally) slip into persuasion mode – a mode that in time of conflict or tension is not well advised. Persuasion mode involves more a focus on getting a point across and less on listening to understand the perspective of others.

4. It takes time for communities to engage with the information and to get down to the finer points of what to do with it. Most people are too busy to simply drop everything to work on a project of this nature. Part of building trust therefore means allowing plenty of time (our participants suggested that about a year's lead-in time was appropriate but this may depend on the process. A great deal of learning can be completed in a workshop format that involves a range of information providers, as our dialogue processes indicate, but these are relatively expensive).

5. Communities with a history of distrusting an agency or who have not been involved in participatory consultation in this way need time to learn how to participate effectively. However, it can be difficult for agency staff who feel either frustrated by what seems like unproductive time or who are put off by the aggressive behaviour they face when first approaching a community. In such situations capacity building is necessary for helping all parties involved to understand and manage these situations. This takes time too.

6. At times people may mistakenly believe that other players are polar opposites of themselves. However, choosing where to focus can also change how people view the attitudes of others. Our dialogue work, for example, helped very disparate groups realise that their advocacy for or against the use of 1080 actually stemmed from a very strong and positive valuing of the New Zealand natural environment. Once this common ground was established, working together became very easy. Nobody changed anybody's attitudes but the common ground allowed disparate groups to listen and understand the others' perspectives. The common ground also allowed those advocating the use of 1080 to admit that using poison over wide tracts of land is not ideal and for those against the use of 1080 to reach the conclusion that it was the best of a non-ideal set of tools. In short nearly[5] everyone in the room realised that even this situation was a relatively complex one that involved more than simply debating the pro's and con's of 1080.

5 *Author's note*: Rather unfortunately, two quite senior agency staff in one of our processes were unable to see that they had learned anything at all from the process because they 'already knew all about 1080' and felt that the meeting was not successful because they hadn't convinced everyone that they were right(!). This approach did not sit well with some of the other participants, who felt it verged on arrogance.

Conclusions

Most of the work of CLEM has been on how to facilitate change processes. A focus on facilitation and removing barriers can be productive and has worked well for many of the groups we have worked with. This is not to imply the process is simple or easy, and as some relatively simple examples show, doing something new requires considerable learning and adjustment of other activities and impacts on other people who may in turn work (sometimes inadvertently) against change. Given the number of barriers that may exist to the adoption of new practices (such as conducting successful animal pest control), we have found considerable merit in working with facilitation rather than motivation.

To understand better how to facilitate and support change we need to know more about information management, networking, learning processes, communication processes, conflict management, capacity building, and organisational systems/learning. Research into these aspects of change will need to look at different scales – from understanding what good communication is in a particular context to ways of developing individual skills, both amongst community members and amongst institutional staff, and on to ways of managing organisational change so that organisations do not impede their own change initiatives.

Many of the answers to questions such as what is good communication and change management are context specific. This means that although there are principles that might be applied across cases, there will always be a need to test and evaluate processes in any particular situation. This is the basis of action research and action evaluation processes. Getting theory into practice (including getting social science theory into practice) is surprisingly complex.

Individuals who are able to take up and use new information are often reflective and interested in learning and are good at seeking feedback about their performance. This kind of self-critique and encouraging critique from others does not sit comfortably with most people, particularly in the case of learning to work with other people better based on research findings and principles. For people to take up new information and try something new requires them to reach the rather uncomfortable conclusion that change is required because they are not already doing it ‘correctly’ .

In situations like this the best pathway to uptake may be to identify people who are more open to change and self-critique (known in some circles as early adopters[6]), build trust-based relationships with them, and then for them to create successful case studies so that others looking over the proverbial fence might start to be interested in adopting similar approaches. At the same time, understanding the factors that prevent communities or organisations from developing new, sustainable practices in pest control is vital to the work of supporting change.

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6 Author’s note: Innovators are also open to change but they tend to be regarded as too ‘way out’ to be seen as leaders amongst the mainstream.

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Reflecting on the rights and wrongs of innovative biocontrols to manage animal pests

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Introduction

Most of my science career has been devoted to studying the reproductive physiology of an invasive animal, the red deer. Introduced into New Zealand in the 19th century (Caughley 1983), they are now an established part of the country's farming, tourism, hunting and pest management activities. As wild animals, their recent adaptation to a farm environment led to a consideration of the consequences of the view that if you change the way you grow and manage the animal, then you change the animal (Fisher & Bryant 1993). Is it right to turn a wild animal into 'an immoral and economically inefficient copy of sheep and cattle' or should we more fully exploit that animal's natural ecological and behavioural traits in an appropriate niche within agriculture? Further musings lead to the realization that the way we treat animals depends on our culturally ingrained beliefs, prejudices and expectations of animals, as much as on their biology or needs (Fisher 1998).

Right and wrong

In considering the right way to do things, be it farm wild deer, treat research animals or destroy pests, we are guided by morals (good and bad, right and wrong) and ethics (the principles upon which morals are based). This approach can be enhanced by considering how different groups see, understand, and value different aspects of the world. Consequently, a framework was developed for helping to understand cultural, community and individual aspects (Fisher *et al*. 2004). Consideration is given to a person's' attitudes, ethics (how we deal with competing motives), and the stories, myths and narratives we use to inform ourselves and others.

Some examples of this type of approach are:

- The finding that people within science have different attitudes towards biotechnology depending on their professional discipline, and the suggestion that this diversity could be better used to help shape public policy and understanding of biotechnology (Fisher *et al*. 2005);
- The use of an ethical matrix as an introduction to the sorts of issues contributing to the rightful acceptance, or otherwise, of a genetically engineered biocontrol for possums (Fisher 2000). For example;
  - will such methods be more humane than conventional means of managing possums?
  - will industries currently using possum products be harmed?
  - will excessive focus on biocontrols penalize those in favour of conventional control methods?
  - who will be liable for unforeseen harmful consequences?
- An understanding of the pervasive influence that our cultural legacy sometimes has. For example, the belief that good shepherds must look after their sheep (a cultural legacy) has resulted in unrealistic and sometimes deleterious expectations of how sheep should be treated at lambing time since excessive human disturbance may contribute to lambing difficulties, at least in extensive situations (Fisher & Mellor 2002; Fisher 2003).

Ethics and possum biocontrols

New Zealand's National Research Centre for Possum Biocontrol program has been set up to develop new tools to manage possums, so as to reduce the threat to native biota and to farm animal health. The program explicitly includes research and policy formulation that address

the social and ethical dimensions of the proposed new technologies. Moreover, it includes a program to inform public discussion about the proposed technologies, and to identify and address societal concerns that may inhibit their implementation. It also intends to engage with key stakeholders and interest groups about their concerns and, if required, modify the research.

Among the concerns which people have regarding the use of possum biocontrols, are their humaneness, the possibility of unintended consequences, their specificity to the target species, their effectiveness and efficiency, and whether they conflict with traditional values and beliefs of the sacredness, intrinsic worth and integrity of native plants, animals and people (PCE, 2000). An ideal biocontrol will thus have to be technically feasible and publicly acceptable. The framework to be used to determine or explore a proposed (pragmatic) biocontrol will be based on: *Ideal biocontrol = proposed biocontrol + justified differences*, where the differences will need to be justified by recourse to appropriate knowledge and justified moral standards. Such standards include that the benefits outweigh the harms (utilitarianism); acknowledging that there are some things we cannot or should not do, regardless of the consequences (rights); or being lead by what a good person would do (virtue ethics). There are many other formal theories giving different insights and they will probably best be mixed and matched resulting in a practical, ecological ethics (Minteer & Collins 2005; Lynn 2005).

The beliefs and stories we tell can be powerful, helping to reinforce what we think is real and what we want to be real (Fisher, 2002). For example, 'possums are New Zealand's public enemy number one' and 'biotechnology may be the only answer to the possum problem.' Such beliefs may or may not be correct, but we need to acknowledge that they are powerful in shaping perceptions. The association between 'natural' and 'good' probably accounts for some of the support for biocontrols. However, we will also have to be aware of the different understandings of the term 'natural' and how they affect different people's perceptions of what is acceptable. Similarly, the term biocontrol has different meanings, evident in the following definitions:

1. Natural - one species regulates another
2. Introduction of a natural predator
3. Introduction of natural micro-organisms
4. Manipulation of natural living enemies
5. Use of natural products – biological pesticides
6. An agent to control fertility

There are many understandings of nature, and by extrapolation of natural, and the widely expanding definition of biological control may contribute to a belief that biocontrols are inherently risky. Biocontrols created with biotechnology may be viewed more along a continuum between traditional biocontrols and synthetic chemical pesticides. Indeed, Goldburg (1996) warned that we should think carefully about embracing biotechnology within the definition of biocontrol – the fear of biotechnology being greater than the fear of traditional biological control – and asked whether the term biocontrol should be limited to what is natural?

Facing up to Frankenstein

Mary Shelley's Frankenstein (1818) is the archetypal story of society's fear of science (Rollin, 1995), with perceived fears ranging from unintended consequences to the violation of life (Turney, 1998). Those involved in pest animal research need to address the fears associated with biocontrols. This should not only be in expert, probabilistic and scientific ways, but also in general, contextual and public ways, especially since the latter's understanding of risk is perhaps the more sophisticated. In doing so, it is important that we challenge ourselves to think about the issues and uncertainties using different insights (attitudes, ethics, stories etc) and different ways of knowing. Ideally people should be empowered (or helped) to participate, with critical reflection and dialogue encouraged. It is important to acknowledge and, where necessary, address the doubts and concerns that people, both scientific and public, have. If biocontrols raise important concerns, or present significant opportunities, then the sooner they are identified and addressed the better.

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Wild dogs in Queensland: social and economic issues

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Introduction

Most pest animals, such as wild dogs, have economic, social and environmental impacts. For these reasons, wild dogs (which include ferals, dingoes and hybrids) have been the subject of management and control by both landholders and land managers. In the last two hundred years the control of wild dogs has varied between baiting, use of a Wild Dog Barrier Fence (WDBF), trapping and shooting and mostly a combination of these.

The control of wild dogs in Queensland is a complex issue due to the extensive distribution of the animals in the State, ranging from wide primary production areas to protected natural areas. Depending on the distribution, some wild dogs such as dingoes, are either pests or protected species, hence requiring varied management strategies. In Queensland a Wild Dog Management Strategy integrates the management of wild dogs and the conservation of dingoes as native species.

There are concerns about raising the level of adoption of wild dog control strategies by land managers in order to achieve better economic, social and environmental outcomes. In Queensland, a project analysing social barriers to adoption is in the pipeline. This will complement studies already undertaken regarding the economic impacts of wild dogs and State-wide and regional studies regarding landholder views about pest animals, especially wild dogs, and their management.

Wild dog distribution in Queensland

Wild dogs occur in both protected areas such as National Parks and State Forests and in wide landscapes where they pose a threat to primary production. Wild dogs also occur in rural and semi-urban residential areas, causing social concerns such as health and safety impacts. Because the dingo is both a natural resource and a pest, there are also varied perceptions on their impacts and consequently, on the importance of control measures.

Since pest animals occur across tenures (both primary production and public areas), problems arise with respect to the expectations of private and public land managers in managing their own jurisdictions. Landholders expect dingoes to be managed in protected areas in order to prevent dingo problems spilling into production areas. Likewise, public land managers believe that landholders are responsible for managing pest animals on their land for a better outcome in dingo conservation and abatement of threats to social safety, especially in nearby rural or semi-urban communities.

Impacts of wild dogs in Queensland

The economic impacts of wild dogs in the State has been estimated at $33 million, including cattle and sheep production losses and control costs by both landholders and State and Local Governments (Rural Management Partners 2004). State and Local Governments spent about $46 million in 2005-06 in pest animals (including wild dogs) and weed management (AEC Group, 2006).

One of the measures to control the spread of wild dogs is the establishment and maintenance of a 2,900 km long Wild Dog Barrier Fence in Queensland, an investment which provides an estimated net present value of $39.7 million to the Queensland economy (EconSearch Pty Ltd, 2000). Expenditure on the WDBF maintenance from NRMW is about $0.5 million, with an equal amount from affected Local Governments within the fence.

The perceptions by landholders about the impacts of wild dogs vary. While some landholders are concerned about direct economic impacts on their production, others accept that these species are a normal part of the landscape (Pimentel 2002).

Factors affecting landholder participation

Landholder participation in wild dog control is affected by various economic, social and institutional factors:

- In a recent landholder survey in Queensland, about 66% of respondents indicated that the main driver for undertaking pest management control is economic (Oliver & Walton 2004). Anderson and Thampapillai (1990) also suggest that economic reason is the most prominent driver for landholder participation in natural resource management activities. The adoption of natural resource management activities by landholders is influenced by their ability to balance their perceptions of immediate costs, such as lost production and control costs, with uncertain future benefits such as higher production.
- Participation in wild dog control also depends to a great extent on landholder perception on whether or not they have problems with wild dogs. While there are evidences of economic impacts of wild dogs, only 30% in a regional survey believe that they have a wild dog problem (Kennedy *et al*. 2006).
- The use of 1080 baiting is a sensitive issue among many landholders, not only due to threat to non-target species but also because of strong ethical reasons about the use of poisons in controlling wild animals. In some instances there is an aversion to the use of poison in their own neighbourhood (Kennedy *et al*. 2006).
- Landholders also have varying perceptions about the complexity, trialability, and effectiveness of pest management and control measures (Nelson *et al*. 2004). For example, aerial surveys are discounted by landholders who are experts in mustering, trapping operations and in monitoring numbers (Kelly *et al*. 1998). Not all landholders perceive the usefulness of the barrier fence in protecting their stock from wild dogs. Only about 38% of landholders believe that the barrier fence is effective. Some attribute the ineffectiveness of the fence to inadequate fence maintenance and improper use of the fence by the public, such as leaving gates wide open for animal intrusion.
- It is widely accepted that not all landholder investments in time and resources when undertaking wild dog control generate private benefits alone. There are also public benefit outcomes, hence the expectation that wild dog control is not only a landholder responsibility but also that of the Government.
- Not all of the community view exotic species as pests. Common pests such as rabbits and wild dogs in Queensland are also regarded as pets. There are some who value them for wildlife interaction opportunities, e.g. visitors going to national parks, attracting dingoes with food offers so they can take photos with these species.

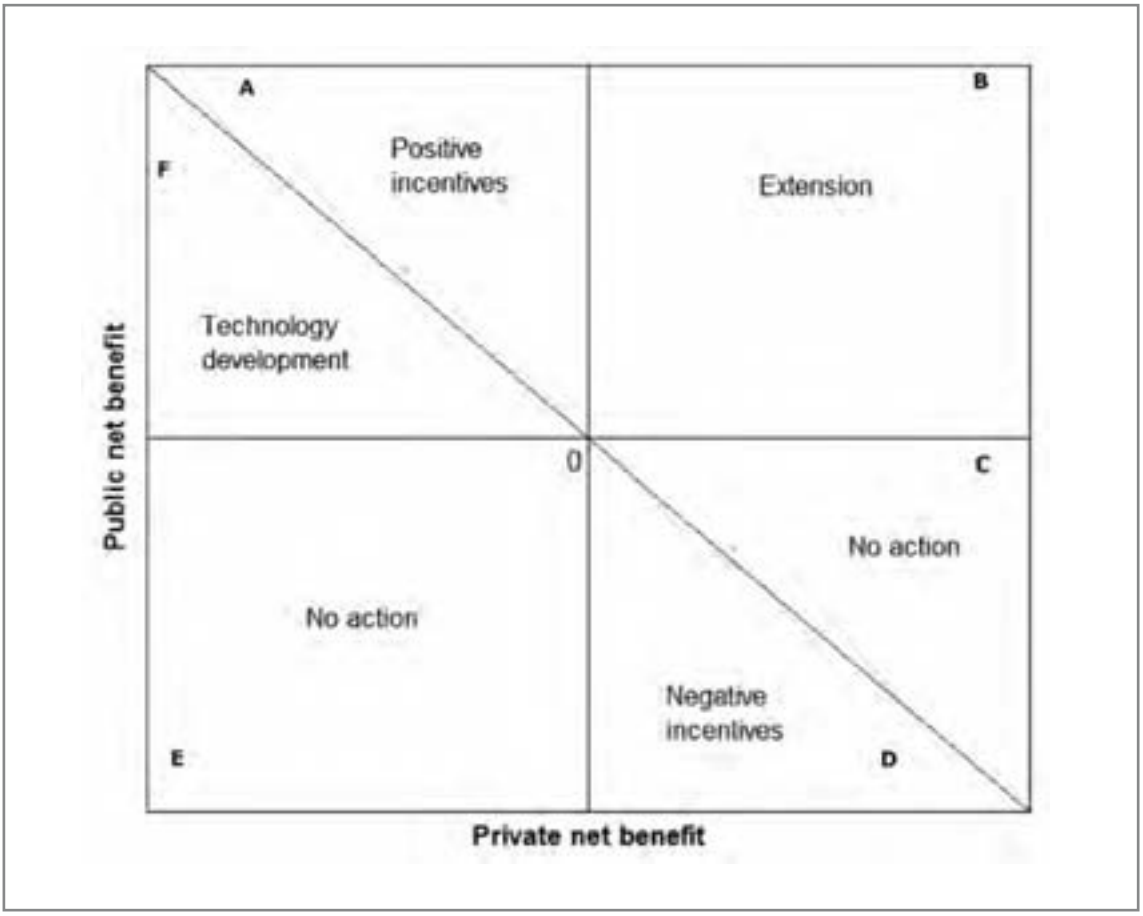
The policy framework: public and private benefits

Any land management activity is by default mainly an economic investment with expectations of short-term and long-term private benefits. However, because most enterprises occurs in wide landscapes, any land management activity generate not only private benefits but also public benefits such as conservation of biodiversity, enhancing opportunities for outdoor recreation and reducing health concerns of the community. The presence of public benefits is the main driver for Government expenditure on pest animal control activities.

It is the 'public good' nature of land management activities that help create problems in creating a motivation for landholder participation in wild dog control. Public goods are characterised by their being non-rival (there is no additional cost in providing an additional benefit) and being non-exclusive (no one can be excluded from enjoying the benefit of wild dog control). Public goods generate a free rider problem, i.e. non-participants and those participating with less intensity, will also reap the benefits of collective land management activities.

The presence of public and private benefits influences public investments in wild dog control as Pannell (2006) demonstrates in Figure 2. These types of benefits determine appropriate policy measures. Pannell (2006) suggests that positive incentives are not necessary in area B where landholders adopt change even without incentives since there are already apparent net private benefits. In areas C, D, and E, where there are negative public net benefits, positive incentives are not required, nor at F where private net costs outweigh public net benefits. Instead of positive incentives, technological development can be used to improve land management outcomes. Where private net benefits outweigh negative public benefits such as in area C, no further action from the government is necessary. In area D, negative incentives such as taxes may discourage further land practices that create more public costs than private gain.

Figure 1 - The policy framework as influenced by expectations of private and public benefits. Source: Pannell, D. 2006.



The extension process, which aims to increase adoption of wild dog control strategies on a wider scale or more collective basis, need to consider what type of information would help to convince landholders of the benefits of participation. For example, the economic impacts to the State economy needs to be translated in a more understood and landholder-relevant format, such as economic cost per ha in terms of lost production, losses due to diseases and through increased control cost, if wild dog population is not managed collectively and more efficiently.

Future NRMW project: assessment of social barriers to wild dog control

In Queensland, a new project under the Service Enhancement Program/Blueprint for the Bush is being planned to:

- To understand and analyse social barriers to wild dog control
- To enhance landholder behavioural change and stakeholder collaboration in wild dog management through the development and implementation of more effective wild dog management strategies

The project will include the following components:

- Social issues/stakeholder analysis
- Framework to address barriers (educational /training programs, capacity building & incentives
- Assessment of participation/barriers to participation
- Pilot studies
- Evaluation of impacts of pilot program and
- Improved stakeholder collaboration in wild dog programs

Policy insights

Any pest management context has to be seen as part of a broader sustainable land management outcome. Landholders are faced with several land management issues, such as salinity and water availability issues. It is common knowledge that most landholders engage in primary production, such as sheep and cattle production, mainly as an economic enterprise, and that the enterprises are normally intergenerational, having been passed from one generation to another. It is in this context that policy makers should see the wild dog issue, with landholders engaging in pest management control for economic as well as for social and environmental reasons. Wild dog control programs need to consider the multi-attribute nature of a landholder decision to participate in any pest animal control on their lands.

Such programs also need to consider using landholder-relevant information which will enhance participation. An economic impact on a property level is more meaningful to the landholder than economy-wide impacts. The effectiveness and compatibility of control programs also need to be demonstrated. Information not only on economic benefits of wild dog control, but also on social and environmental impacts of these programs need to be assessed, in order to show that there are net gains of participating, not only for landholders but also for the general community. After all, there are altruistic reasons for undertaking pest animal management activities.

Because of perceptions of public benefits as outcomes of wild dog control, there is a need to examine more closely the cost-sharing arrangements in various wild dog control strategies. Corollary to this is the need to examine the most appropriate policy measures in wild dog control since government investments in wild dog control also need to be cost-effective.

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Social drivers of invasive animal control: Perspectives from Environmental Psychology

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Introduction

Environmental psychology is the study of human-environment relationships. We seek to understand both how the physical world influences human experience, and human behaviours that impact on environmental quality. Environmental psychology draws on social, cognitive and evolutionary sub-disciplines of psychology. Psychology in general focuses on understanding the individual person in society.

In exploring possible social drivers of invasive animal control, I will draw on research on forestry issues. A team of researchers at the University of Melbourne have been exploring public opinion on management options for forest harvesting. This is an emotional and high profile issue. Parallel issues in invasive animal control might include public views on controversial management strategies such as culling of native species.

Social acceptability of management options

The concept we have been using to explore public views on forest management is acceptability. Acceptability can be defined as

> *…a condition that results from a judgmental process by which individuals (1) compare the perceived reality with its known alternatives, and (2) decide whether the 'real' condition is superior, or sufficiently similar to, the most favorable alternative.* (Brunson *et al. 1996)*

This definition implies a complex internal process by which individuals (1) construct a mental representation of the character and outcomes of a management option being evaluated; (2) compare this representation with mental representations of known alternatives; and (3) evaluate the relative merit of these alternatives against some internal criteria. It implies that alternative conditions might be judged against multiple criteria (Williams *et al*. 2001). To understand why people will accept or reject a proposed management practice, it is therefore vital to appreciate both the beliefs that people hold regarding the character and consequences of management options, and the criteria against which these options are assessed.

An example: Acceptability of Forest Management Options

Ford, Williams, Bishop and Webb (2005) investigated relative acceptability of clearfelling and alternative harvesting systems that retain trees in different amounts and patterns within a logging area.

- Computer generated images were used to represent harvesting options in rich visual detail
- 551 participants were recruited from the general public as well as forest industry and conservation groups
- Half the participants viewed information about selected environmental, economic and social outcomes of each system; half were not provided with this information

- Participants rated each system on 7 point scale (very acceptable- very unacceptable)
- Participants also answered questions about their values, valued outcomes and beliefs about the consequences of clearfell harvesting
- We assessed the relative acceptability of management options, making comparisons of acceptability judged: with and without information about outcomes; of options presented in still and animated formats; and by members of forest industry, conservation groups and the general public).
- We also explored the relationship between values, beliefs about consequences and acceptability judgments.

The psychology of acceptability judgments

At the simplest level, acceptability might be understood as evaluation of the consequences of a management option for valued outcomes. Some important things to consider here:

- Values are preferences or ideals at an abstract level (eg. wealth, healthy environment, healthy family). Most psychologists understand values to be a core and enduring component of personality. We hold many different values, but hold some of these values more strongly than others (Rokeach 1973).
- Many environment researchers have described values as more specific outcomes, such as timber and wildlife habitat. From a psychological perspective, these might be better viewed as valued outcomes. They might be closely aligned to particular values. For example, the person who holds a value of wealth may express a general attitude that economic efficiency is an important outcome of forest management.
- Concern about environmental management arises where a person believes a situation threatens one or more value or valued outcome (Stern 2000). For example, a person might believe clearfelling threatens wildlife habitat, or that it leads to good eucalypt regeneration.
- Multiple valued outcomes may underpin acceptability judgments, raising the possibility of 'trading off' valued outcomes; a person might accept a situation while recognising that it is not ideal on all criteria.
- Many factors beyond values and beliefs will shape acceptability of management options. These might include trust in management agencies, social norms, media coverage, access to information and more.

Tradeoffs?

Our exploration of acceptability judgments suggests that people are not always open to the possibility of trading off valued outcomes. We are currently exploring decision-making literature that suggests tradeoffs may be difficult and sometimes impossible. Researchers have identified beliefs they have called 'protected values' or 'taboo tradeoffs' (Gregory 2002). These are absolute normative beliefs that are protected from tradeoffs. In the forest debate these might include beliefs such as 'old-growth forest should never be logged'. Invasive animal control decision-making is likely to be influenced by similar beliefs about the rights of particular animals or species.

Acceptability and theories about behaviour

Our work has primarily been about public concern. While public concern will be vital as a driver of invasive animal control, particularly in the political sphere, concern does not always lead to positive behaviour. Environmental psychology has much to offer in understanding the drivers of individual behaviours relevant to control of invasive animals.

Our understanding of acceptability judgments draws on Stern's (2000) work on environmentally significant behaviour. His Value-Belief-Norm model suggests that action is the outcome of a personal norm, or sense of obligation to act in a given way. These personal norms are activated when a person:

- Believes a valued outcome is threatened
- Believes he or she has the capacity to reduce this threat

Stern's work is related to the better-known Theory of Planned Behaviour (Ajzen & Fishbein 1980), but makes the motivational significance of values more explicit. Stern (2000) also places this Value-Belief-Norm model within a wider understanding of the way that both internal factors (knowledge, skills and habit as well and values and beliefs) and external factors (legislation, costs, advertising, social norms) shape environmentally significant behaviour

Stern's work is readily applied in understanding the social drivers of invasive animal control. A number of behaviour change programs have been developed based on his work. The work of McKenzie Mohr (2000) promoting Community-based Social Marketing Approach to behaviour change programs is largely informed by Stern's work. McKenzie Mohr provides a very accessible package of process and tools for encouraging behaviours considered socially beneficial, and is being widely applied in environment and health sectors.

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What drives wild dog control?

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Abstract

This paper reports on a retrospective enquiry into the origins of a successful wild dog management program. It is an account of a pilot project using a phenomenological research approach that emphasises the rich descriptions of the lived-experience of wild dog attacks on commercial sheep flocks from three perspectives: the landholder, a government agency representative and, an industry/community representative.

Actual dog attacks are described in horrific terms and as highly sensual and perceptual events. The detailed telling of the experience is mutually created and fashioned anew at every telling and hearing. Yet few want to hear the actual story. Government agencies seek to dismiss the events as hysterical exaggerations; industry bureaucrats see the socio-economic impact as minimal; and neighbouring landholders don't want to be confronted with detailed descriptions for fear of 'infection'. Yet it is being infected by those feelings, and so experiencing them, that constitutes the phenomenological method and is the prelude to effective action.

The rich phenomenological descriptions show that the identity of the sheep owner is fused with the dying animal: she/he becomes the animal she/he is portraying. In re-telling the story the victim of the dog attack is emphasising the 'thing-ness' of the physicality of the experience and is expressing the desire for an emotional 'response'. What has been hidden as unacceptable is revealed in the phenomenological re-telling.

It is hypothesised that the formation of an experiential 'system', one constituted in the language and experience of the various stakeholders, is the first stage of any program design intended to achieve successful action.

Research question

Is the 'public' and detailed re-experiencing of the dog attacks by the critical stakeholders the primary motivating force in shaping an effective control program?

Research design

The three parties that were brought together by the dog attacks were: firstly, *the pastoralists*, a family represented by the husband and wife who spoke of a six-year period as a 'constant nightmare' when, every night, their sheep were savaged by wild dogs; secondly, *the public servant,* a member of the State Government bureaucracy (National Parks) responsible for the conservation management of large tracks of public land and, as a consequence, of wild dogs; and finally, *the industry/community activists*, another husband and wife team representing a perspective of the superfine wool (sheep and goats) industry.

An in-depth interview[7] of approximately 60 minutes was conducted with each of the respective parties. Each was invited to actively engage in the re-telling of their various dog-affected experiences. In setting guidelines for the engagement the researchers, in their manner of interviewing, encouraged the interviewees to adopt the following attitudes: fidelity to the *particularity* of the experience; its *immediacy* (as lucid and vivid a re-telling as possible); the *intimacy* of the experience (description from both the 'inside' and the 'outside') and; *intensification* of the experience (focusing on details that were seen to encourage intensity).

7 Three researchers, all experienced in using phenomenological methodology, were invited by Helen Cathles (IA CRC) to conduct the interviews. The author was the lead researcher and was ably assisted by Dr Mary Murray and Dr Claire Jankelson.

Following the individual in-depth interviews the entire group (n = 8) was brought together, for approximately 90 minutes) to reflect on the impact and possible consequences of the re-telling of the dog-affected experiences.

The human experience with dingo predation

1. The pastoralists

After six years of living in a 'dog-affected area' the pastoralists had to discontinue the farming of sheep and instead, tuned their hand to cattle. The experience of nightly dog attacks (10-12 sheep killed each night) was described as 'torture' because of its relentlessness and inherent horror; this experience was exacerbated by the unexpected event of the feeling of 'uselessness' in the face of the bureaucracy's unwillingness to engage, seriously, with the problem. Such was the felt frustration by the pastoralists that they referred to the government agents as 'human rubbish'. The pastoralists asserted that they knew how to manage the problem based on their first-hand experience, if they were just given the means. The government personnel, on the other hand, asserted that the pastoralists had wildly exaggerated the attacks, were over-emotional, and in fact were lying about the extent of devastation. It was this rejection by the responsible agencies that increasingly became a source of anger and constituted an additional and ongoing experience of torture. In the words of the pastoralists: '... Really the dogs are no problem in comparison to the rubbish that you have to put up with in trying to find solutions to these problems'. Another source of frustration was the reaction by neighbouring pastoralists, who, due to different geographic boundaries, especially with National Parks and other heavily forested land, were only minimally affected, if at all, by wild dogs. Even these neighbours stated that they either didn't believe the dog-affected pastoralists or didn't think that it was a particularly important problem. The upshot of all this was that the pastoralists have become committed advocates for wild dog management if not their total eradication. Their antipathy towards the bureaucracy has in no way diminished.

The clear message was: Nothing can happen until the appropriate people take my accounts seriously!

2. The government agent

The government agent's role was to represent his organisation at meetings with private land holders. These meetings sought co-operative solutions to shared land management issues such as management of joint boundary fences and weeds, but the one issue that inevitably stopped the progress of the meeting was wild dogs. This blockage was essentially due to the vehemence directed to the government representatives by those whose stock had been dog affected. After a number of years of attending these meetings the government agent realised that dog attacks were not just a matter of economic hardship but were a 'source of enduring emotional distress'. His own frustration mounted when, back in the office, his colleagues were only ever willing to calculate the financial loss; they were blind to the huge emotional cost incurred by the particular pastoralists. Emotional costs could not be quantified whereas financial ones could be and, for the overall industry, the financial loss was not great. '*What **is** the problem*?' was the question that would inevitably be asked. Meanwhile at the meetings, such was the abuse and venting of spleen being directed to the government land managers that, at times, the police had to be called to re-establish the peace. Years went by and the relationships between private and public land managers were just spiralling downwards: '... landholders didn't want to talk to us ... they would say: *What is the point of talking to you people; you don't do anything about the dogs*'.

The government agent described himself as being 'caught in the middle … between conservation groups who wanted to protect the dingo and the landholders who wanted them all wiped out. As an agency for the conservation of public parks, if dingos are in the park then we are supposed to protect them. If they are causing a problem, we are supposed to kill them.' As a conservationist the government agent expressed his love for the animal with its pack structure and breeding habits: '*To have dingoes howling in the wild bush is really fantastic … I can't see why we can't have both*'.

The turning point came when participants began to listen, emotionally listen, to each other and finally arrived at the understanding that they were all land managers and needed to work together.

So began a working relationship which had as its outcome the acquisition of additional and specialised government funding for the express purpose of jointly mapping where the wild dogs were (actually on both public and private land) and when they would come out of the bush. As a consequence, money became available to pay for dog trappers. Funds that would offer them stable, long-term employment and enable the development of a multifaceted control approach 'from paddock to the bush'. Given the past decade of problematic relationships, the fact that these plans could be collaboratively developed and implemented was a major achievement.

3. The industry/community leaders

The industry/community leaders emphasised the disturbing vision of the results of a dingo attack: seeing the animals that, as a good pastoralist, you raised and cared for being chewed and ripped apart. Because this was such a specific experience of devastation, specific to a particular property, unlike, say, a mice plague that affected everyone, it wasn't typically a problem that engaged industry leaders. The consequences of the attacks on these particular pastoralists were dire enough to be perceived as catastrophic in two spheres: on the one hand, the huge loss of genetically improved flocks that had been built up over years of breeding; on the other hand, the family, which had been a leading light in the community, became, consequent to a series of wild dog attacks, such emotional cripples that the whole community suffered. The cost inflicted to the genetic improvement was judged by the industry as high but by no means as the most important: '*The greatest cost of all is the social cost … It absolutely undermines the family, the community and the region, as well as the enterprise*'.

It was only after listening, a deep emotional listening, that these industry/community leaders felt compelled to act. Even though they had only been minimally dog-affected themselves, they began to see the huge cost to the community as a whole.

A problem-determined system

It is the argument of this paper that a phenomenological approach brings the researcher into an ecology of experience and, through this attitude and language, creates (co-evolves) a new experience (a new reality). Paul Watzlawick (1976), in a similar vein, speaks of creating a 'second order reality'. This ecology of experience (a human system) can usefully be understood as a meaning and language system. One of the major insights that resulted from the early family therapy movement was that of problem-determined systems (Anderson *et al*. 1986). Here the system exists in language and action rather than in social-political constructions (e.g. the family). The early family therapists were keen to point out that the use of a problem-determined system did not imply that there was consensus around a problem definition, but merely that there was a problem. Gregory Bateson's (1972) 'ecology of mind' or ecology of ideas was a seminal influence in the development of this notion. Communicatively shared problems mark and define the system. The narrations of three diverse-but-linked experiences

of devastation constitute an organisation understood as an ecology, i.e., a dynamic network brought into being in language and emotion. Understanding the various parties as, together, constituting a dynamic ecology is both liberating and instructive. It is liberating in as much as 'the system' is no longer a fixed structure that is 'out there' with lines of authority, channels of communication, and so on. It is instructive in that it lends itself to being seen as the only real source of effective action.

Conclusion

A phenomenological appreciation of the 'dog problem' facilitates a responsiveness from all stakeholders (landholders, government agencies, industry bodies) that has not been found with more positivist approaches. The ambiguous, contradictory, and mythic qualities of the experience challenge the taken-for-granted managerial style and question the rational understanding of both problem and proposed solution.

This study represents a quest to reveal, interpret, and communicate, through the eyes of human experience, the enigma of the impact on the human psyche of wild dog attacks. The life-worlds of three participating groups were linked by this problem.

The orientation of focusing on the 'organisation of experience' rather than the experience of an organisation (whether it be the pastoralists, the agencies, or the industry) emphasises the role of the emotion-full re-telling of experience as a way-of-knowing over rational judgement as the preferred, or worse, the 'only' way of knowing. In this manner one is reminded that when it is a matter of intense experience, the *how* of experience is more relevant than the *what* of experience (Casey 1991, p.39).

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The Social Drivers of Invasive Animal Control

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Introduction

> The most difficult part of wildlife management is the management of people, not wildlife (Shaw 1985, p.1).

It is now widely accepted that an understanding of the human dimensions of wildlife management is critical to the successful management of invasive species (Conover 2002). The human dimensions of wildlife management can be defined as 'how people value wildlife, how they want wildlife to be managed, and how they affect or are affected by wildlife and wildlife management decisions' (Decker *et al*. 2001, p.3).

This is particularly important for the management of invasive species where there are often conflicting views on what 'the problem' is and diverse opinions about how problems can be solved.

This paper is based on a presentation made at the 2006 Invasive Animals CRC workshop in Adelaide (26-27 July) and provides an overview of the research I have been involved in over the last 10 years and its relevance to the theme of the workshop – social drivers of invasive animal control. More specifically, it will address the following questions:

1. Are the perceptions held by wildlife managers always accurate?
2. How do public and stakeholder groups value wildlife?
3. Do different demographic groups have different opinions about wildlife and wildlife management approaches?
4. What lessons can we learn from one particular example of pest animal control?

1. Perceptions among wildlife managers

There is now a growing body of evidence to suggest that wildlife managers do not always have accurate perceptions of the values and opinions of others, or even themselves (see for example, Vining & Ebreo 1991; Siemer & Brown 1993).

During a series of interviews (n = 15) with Victorian wildlife managers in 1998, it became clear that we often make assumptions about other people and that those assumptions are not always consistent with reality (Miller & McGee 2001; Miller & McGee 2000b). For example, some of the interviewees held a perception that members of voluntary conservation groups have a lower factual knowledge of wildlife than managers. However, surveys of 13 different public (n = 639) and stakeholder groups (n = 792) revealed that some voluntary conservation groups have higher levels of knowledge about wildlife than managers (see Miller & McGee 2001).

Another example of assumptions about stakeholders can be provided in a study that assessed communication between licensed wildlife rehabilitators in New York and wildlife managers from the New York State Department of Environmental Conservation's Bureau of Wildlife (Siemer & Brown 1993). Siemer and Brown's study explored how rehabilitators and managers perceive each other's attitudes and values relating to wildlife management issues, and then compared these perceptions with how each group actually views wildlife. The study identified a number of areas where the perceptions each group held about the other group were inconsistent with how each group actually views wildlife and wildlife issues. For example, wildlife rehabilitators underestimated the strong wildlife-use orientation held by Bureau of Wildlife staff, even though rehabilitators have direct contact with their staff. In addition, Bureau of Wildlife personnel 'underestimated the importance rehabilitators placed on conservation of ecosystems' (Siemer & Brown 1993, p.v).

Thus, it is important to recognise that perceptions are not always accurate and that human dimensions research is crucial in replacing 'assumptions with knowledge for improved management decision making' (Decker & Enck 1996, p.61).

2. Public and stakeholder values of wildlife

The surveys mentioned above give us some insight into the values and knowledge of wildlife held by Victorian residents. The study (Miller 2000) was designed to 'measure' the following values of wildlife within the Victorian population (Table 1).

Table 1. Values of wildlife (Miller and McGee 2000a; adapted from Kellert 1996).

Value	Description
Curiosity/learning/interacting	Interest in exploring, experiencing and learning about wildlife and nature.
Dominionistic/wildlife-consumption	Interest in controlling nature through consumptive wildlife activities.
Utilitarian-habitat	Interest in the practical value of the land.
Humanistic	Emotional attachment and love for animals.
Negativistic	Fear of wildlife.
Aesthetic	Interest in the physical appeal and beauty of wildlife and nature.

For each of the Victorian municipalities included in the study (three rural, three urban and one urban-fringe), survey respondents scored highest on the humanistic value scale; followed by the curiosity/learning/interacting value. The general public of Victoria tends not to express the negativistic, aesthetic, utilitarian-habitat and dominionistic/wildlife-consumption values (Miller 2003).

These results, together with other studies, suggest that people in Australia have strong emotional attachments to individual animals and have a high level of concern about the way in which animals are treated. The following findings illustrate this.

- Most survey respondents agreed with the statement '*I consider myself a person who loves animals*' (86% general public) (Miller 2000).
- 91% of wildlife managers (see Miller & Jones 2005) agreed with the statement '*Minimising animal pain and suffering should be an important consideration in wildlife programs in Australia*'. This is significantly higher than the response from wildlife managers in the United States (57%; $\chi^2 = 58.4$, d.f. = 4, $P < 0.001$) (Brown *et al.*, 1992).
- Most survey respondents agreed with the statement '*Recreational hunting is cruel to animals*' (73% Bird Observers Club of Australia; 69% Field Naturalists Club of Victoria; 91% RSPCA; 74% Australian Conservation Foundation; 36% Parks Victoria; 7% Victorian Field and Game Association[8]; 63% general public) (Miller 2000).
- 71% of survey respondents in a survey of the Victorian population said 'yes' to 'Do you have any pets?' (Miller 2000).

8 Now Field and Game Australia.

Studies on invasive animal control also highlight the different perceptions that people have about invasive species. For example, a recent study on community attitudes and perceptions of wild horses in Victoria (Nimmo, Miller & Adams *in prep*.) found that 79% of respondents did not view wild horses as a pest species. The study also found that these perceptions were strongly tied to the level of support for the culling of wild horses and for different management techniques. Survey respondents (n = 105) rejected helicopter shooting as a method of control, preferring immobilisation (31%) and mustering (44%).

3. Demographics and diversity

As highlighted above, different groups of people often have different perceptions of wildlife species and management techniques. Similarly, there are also differences between the demographic subsets within populations.

For example, many studies have found that females express the humanistic value more strongly and the dominionistic/wildlife-consumption value less strongly than males (Kellert & Berry 1987; Miller & McGee 2000a). Recent research suggests that some of these trends are relatively consistent across different populations and special interest groups, while others differ between groups. For example, male and female Australasian wildlife managers responded differently to some of the questions on a 2002 survey (Miller & Jones 2006), but the differences were only observed in the 18-30 year age category. Similarly, differences between males and females in the general population survey discussed above (Miller & McGee 2000a) were more likely to respond to survey questions differently in the rural and urban-fringe samples when compared with the urban samples.

This highlights the need for human dimensions studies for different locations and different wildlife management scenarios. Managers, researchers and educators must not assume that studies conducted elsewhere will provide the answers for the management of wildlife in an Australian context.

4. Urban possum management

Many of the social drivers relevant for invasive animal control can be seen in the case of urban possum management. It is widely known that possums, particularly the Common Brushtail Possum (*Trichosurus vulpecula*), are considered to be pests in some parts of Australia. A study we conducted in one particular municipality in metropolitan Melbourne (Miller, Brown & Temby 1999) found that 33% of survey respondents (n = 142) held a negative view of possums – that is, that they are seen to be 'nuisance/pest/vermin'. The study also found that many people think they have a possum problem, when they actually have a Black Rat problem (*Rattus rattus*).

Current work is underway through Amy Whiting's honours project at Deakin University to explore attitudes towards possums in 2006 and, more specifically, responses to the Victorian Living with Possums policy which was introduced in 1997.

Two small-scale studies in 1998 (Temby 1998) and 2002 (Picone & Miller 2002), revealed that many people are unaware of the details of this policy and that some people are responding to their possum problems using illegal practices.

This work again emphasises the importance of understanding the social dimensions of wildlife management issues. If the individuals affected by pest or invasive species do not define 'the problem' in the same way as managers, or if they do not understand how to solve the problem effectively, legally and humanely, then the problem may remain unresolved or more problems may arise.

Conclusions

This paper has discussed a number of recent studies that provide insight into the human dimensions of wildlife management in an Australian context. They suggest that, in any wildlife management scenario, there are a number of social drivers that will influence the decisions made and the effectiveness of management approaches. The following list, though not exhaustive, summarises some of the drivers that are relevant for the control and management of species considered to be invasive:

- Attitudes and values of wildlife and wildlife management approaches
- Awareness and knowledge
- Perceptions of the severity of the problem
- Demographic profile of special interest groups and communities
- Assumptions about the responses and values of others
- Communication between stakeholders and communities

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Social principles for agricultural extension to assist in the promotion of natural resource management[9]

F. Vanclay

Abstract

An understanding of social issues, the social nature of farming, and the social basis of adoption is needed if agricultural extension is to be effective in addressing natural resource management issues, and in promoting sustainability in its triple bottom line conceptualisation. Twenty-seven principles are presented here, with the key principles being: awareness of farming as a social activity; recognition of the social diversity of farmers and the social drivers in agriculture; and the socio-cultural basis of adoption.

Keywords: rural sociology, farming, barriers to adoption, social drivers.

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9 This abstract and the link to the original paper have been made available with the kind permission of Dr Chris Anderson, Managing Editor of the Australian Journal of Experimental Agriculture. The CRC thanks Dr Anderson and AJEA for assistance in this matter.

Enhancing Stakeholder Engagement

Tim Smith

CSIRO Sustainable Ecosystems

Introduction

Participatory approaches to natural resource management (NRM) have been emerging in popularity over the last few decades. I provide a very brief overview of stakeholder engagement, and learnings gleaned from three current projects located in South East Queensland (SEQ), the Lake Eyre Basin (LEB), and Australia's Tropical Savannas.

Rationale for Stakeholder Engagement

Top-down approaches to NRM were largely justified by a tragedy of the commons type mentality first discussed by Hardin in 1968. Since that time, there has been increasing debate regarding the value of empowering communities to manage their local resources. While there are numerous examples of this debate evident in the literature, Korfmacher (2001) provides a succinct summary of the three rationales used to justify community empowerment, namely: (i) a democratic rationale – which emphasises the inherent value of public participation in decisions that affect communities; (ii) a substantive rational – whereby citizens may have unique contributions to public decisions, and citizens' values and technical knowledge should help to inform the final decision; and (iii) a pragmatic rationale – whereby communities that have contributed to, and been educated by, the decision-making process are more likely to support the decision outcome and facilitate its implementation. In terms of research, Functowicz and Ravetz (1991) introduced the term 'post-normal science' to describe a new paradigm in the approach to science – one that is intrinsically value-laden, participatory and dynamic (Smith & Smith 2006).

Types of Engagement

Since Arnstein's landmark paper (1969), there has been much debate on the actual level of engagement, from full citizen control to manipulation. This thinking has also influenced discourse on the types of community involvement in research, from research 'on' people, to research 'with' people, to research 'by' people (eg. Thomsen 2003).

Learnings from the Field

Three current research projects are used to provide some contemporary lessons relating to stakeholder engagement for NRM. The projects include:

- Enhancing community engagement in the SEQ Western Catchments
- People, Economies and Communities of the Lake Eyre Basin
- Healthy Regional Planning Systems (Tropical Savannas)

The projects cover stakeholder engagement issues at a range of geographic scales and contexts; from remote regions to those in rapid transition (eg. peri-urban areas).

Learnings

- Engagement practitioners often perform multiple roles - which may be in conflict (eg. promotion of production values vs. promotion of conservation of biodiversity)
- Engagement practitioners have little formal training in engagement
- Engagement practitioners have multiples objectives and worldviews that may influence the approach and effectiveness of engagement
- Context can create challenges for stakeholder engagement (eg. changing land uses and demographics; and changing power relationships)
- Most engagement focus in the three study areas has been on those groups who are already engaged in NRM, yet there is acceptance that many other groups continue not to engage

- Engagement challenges are both generic (eg. limited funding and unrealistic deadlines) and context specific (eg. distances and seasons in remote northern Australia)
- Engagement tools used are top-down and involve the usual suspects – there was limited evidence of the use of innovative tools (eg. most tools used were public meetings and media awareness raising)
- There are few examples of monitoring and evaluation of engagement success (and where it does occur it is largely informal and anecdotal)
- Motivations differ between community groups (eg. in the SEQ Western Catchments, Landcare participants had an affinity with a 'greenie' philosophy (ecocentric perspective); primary producers were motivated by sustainable livelihoods (production centric perspective); and non-NRM groups such as service clubs and rural bush fire brigades were motivated by supporting vulnerability with communities (anthropocentric perspective)
- Engagement preferences differ between community groups (eg. in the SEQ Western Catchments, Landcare participants preferred on-ground activities; primary producers wanted someone who they could talk to with detailed industry and local area knowledge; and non-NRM groups preferred engagement activities to fit in to their existing (often Bureaucratic) structures
- Disconnects exist in formal relationships both within and between sectors, hence, an emphasis on 'one voice' for sectors may not be appropriate
- There are challenges in engaging power holders who are not residents of the areas that they influence – eg. mining companies in remote regions
- Engagement strategies need to consider communities of place; as well as, communities of association and communities of interest

I am able to provide further information on the projects and associated publications.

Summary thoughts

NRM is a social process and effective engagement is both complex and critical. Engagement activities need to be matched to: (i) diverse motivations and preferences of participants; (ii) the capacities of the engagement practitioners; and (iii) the dynamic local context of engagement. 'Enabling' processes such as engagement need rigorous assessment – similar to assessment of on-ground change. Lastly, the drivers of people/communities and governments need to be understood; as well as, the mechanisms to support them.

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Social Impact – Know the people, Know the enterprise

Helen Cathles

Wee Jasper, NSW

Invasive animals do strike existing enterprises. To identify the social drivers and opportunities for cooperative management, it is important to understand the enterprise. Agriculture like all industries has a new face in the global economy, we are told to drive our production up and our costs down, to innovate and adopt new practices. Each commodity will have its specific farm management structural practices.

My expertise is in superfine wool and mohair production and the grazing of animals at the interface of Crown and private lands on what is generally rugged tablelands to mountain country. Our most damaging invasive animal is the wild dog and dingo. So I'll speak from that perspective.

I will outline the commitments and pressures that already exist in the enterprise before it is complicated by an invasive animal. I will also outline the impact of the physical attack by the wild dogs. It is important to grasp where the individuals are at in order to access their assistance and participation in successful invasive animal control.

Aspects of farm management

The physical program of on farm activities includes but is not limited to the following:

1. Good livestock genetics are essential – Identifying the desirable genetic traits to produce a worlds best superfine wool product is done with OFDA or Laserscan fibre testing and fleece weighing and by accessing data banks such as Sheep Genetics Australia for the development of performance indicators and ram and ewe selection for breeding. Fibre testing involves mustering each mob to a central location, hiring a fibre testing contractor and an additional staff member. This can take several days depending on stock numbers. Managing the feed, water and return to paddocks is also essential for animal health.
2. Animal welfare – monitoring animal health, worm testing, drenching; crutching; shearing; joining for breeding; weaning; marking, mulesing. All of these are intensive operations requiring additional staff.

   Monitoring animal health is ongoing with additional staff including shearers, rouseabout, woolroller, classer, presser and outdoor staffer. These are a minimum and do not include the mustering and managing the care of stock. Marking and muelsing is, for efficiency, a 4 person job and includes earmarking, drenching, inoculating, tail docking, castrating and muelsing – some regions divide this up and mulese at a different time.
3. Pasture improvement – Pasture improvement programs are usually planned over a 3 – 5 year time frame, with soil testing, soil preparation, liming, spraying, seeding and fertilising taking place over a 6 month period. This locks out grazing for a minimum of approximately 4 months. Currently there is limited application of paddock cell grazing techniques.

   Pasture improvement is usually done by a contractor due to the machinery required.
4. Landcare – maintaining a sustainable eco system is vital in light country and includes arresting gully erosion, dryland salinity and renewing paddock trees. This can require sowing and fencing out areas or tree guards. Whilst it is one of the more satisfying programs it is, however, from my experience the first to be put on hold if there are constraints on time and money.
5. Fencing program – fencing changes such as additional gates or paddock size for ease of operation, roadway exclusion; renew aged fencing; ongoing maintenance repairs – due to wombats and kangaroos – and as a tool in erosion control. In country affected by wild dogs

fences are not always beside tracks, with steel posts, strainers and rolls of wire needing to be carried 200 or more metres over rough terrain. It is extremely heavy work. It is not unusual for a property to have 30 kilometres of fencing to maintain. Personally Ian and I have approximately 70 km over 9,000 acres, and while following the 2003 fires we have replaced many km of fencing, we still have 16 km to replace.

6. Administration – as with any small business this is time consuming and covers everything from wages, to BAS, monthly accounts, decision making, training courses in the computer accounting package; industry training for accreditation in chemical usage, OH&S and mulesing. There are also a number of non compulsory demonstrations and field days, conferences and workshops throughout the year.

7. Repairs and maintenance – of shearing shed, machinery shed, homestead, cottages and roadways etc. are usually done on farm as to get a professional tradesman out has a starting fee around $165 for travel and time.

Managing the smooth running of all the above programs takes an inordinate amount of time on the telephone as well as essential thinking and reading time. The Australian Bureau of Statistics figures over all speciality sheep farms, indicate there are generally 2 decision makers (husband & wife) but the top 25% of producers have 2.4 – I wonder if the .4 is the facilitator!

Available labour force

Change, in terms of trade, has seen a dramatic shift in the demographics of the rural population over the last ten years. The average age of farmers is now 55. The number of young or next generation farmers is frightening low. In Wee Jasper, in the 1950's, there were 30 men employed full time on properties in the valley. Today there is not 1 full time employee and we are the only enterprise with a permanent part time employee. Properties are either owner operated or planted to pines. Every owner operator is taking up the job gap. Additionally it is not unusual for one member of the partnership to also be working off farm.

Job opportunity, security and wages in the city are better. Our son, who now works in Canberra, says he never knew work could be 'so easy!'. Although he has an aversion to flying, he says that he just sits in the aircraft, thinks 'I could be shearing' and quite happily pulls the safety belt tight.

Our commodity prices fluctuate

This makes budgeting extremely difficult. The annual returns also reflect the drought conditions. The Australian Bureau of Statistics figures for speciality sheep farms (ABS 2006) for 2001 – 02 to 2003 – 4 reveal:

- Average farm cash income was $65,500
- Average farm business profit/loss was – $11,200
- Average off farm income was $26,498
- Rate of return excl capital appreciation was – 1.1% in 2002-03, 0.0% in 2003-04 preliminary estimate and – 0.6% in 2004-05 provisional estimate

Drought declarations over the past 6 years have extended throughout NSW, VIC, QLD, SA and WA.

Exceptional Circumstance declarations have been in place in many of these areas.

My point is that regardless of the commodity produced, or the invasive animal to be dealt with, the resources of time and money are either already allocated or in the negative. When you consider the invasive animal problem is time consuming and resource hungry a monumental clash is inevitable.

The actual invasive animal strike hits into the above enterprise delivering an unimaginable blow to the operator. Invasive animals attack randomly and move regardless of land tenure; be it public or private. They are habitat and food focused.

What happens to your farm management programs? The animal welfare, pasture improvement and the genetic analysis all stop. When these program cycles are broken often the seasonal window is shut. You have effectively lost a year. This halts all proactive land and enterprise management programs. One of the greatest costs is what you do not get done.

A wild dog attack is an emotional and psychological shock. Vital genetic gains are lost in an instant, at the whim of an invasive animal. Your sheep or goat has been torn apart and other animals are suffering. It is totally out of your control. The smell of the torn carcass sits in the back of your throat and you can taste that smell. I understand it is the same for those affected by mice plagues the knowledge of the smell and the taste of the smell is never forgotten. Disposing of the killed, and killing the injured victims is, likewise, an unforgettable task. It can be physically exhausting. A neighbour had 60 sheep in full wool, mustered into a dam and drown. They all had to be cleaned out by hand.

Your remaining stock are in danger, introducing a whole new set of issues. Where do you relocate stock to? What paddocks are available, is there enough water, will they require supplementary feeding, where can you purchase feed from? The queries seem endless, but each one requires time, $'s and stamina.

Ongoing surveillance is critical. Wild dogs strike in any of the 24 hours in the day. You have to anticipate where they will strike, because they will, over and over again. You have to think like a dog. You can be out every night, every morning before dawn, it is endless. Your work your life your family is in chaos, nothing remains the same.

I have heard the analogy drawn to an urban dweller returning home to find their house burgled, then returning home the next day to find their home burgled again. They then return home the next day to find their home burgled yet again, and so on, but know that their neighbour was not affected. It is isolating and a total violation that is beyond your control.

The sheer exhaustion is overwhelming. The cycle can stop as quickly as it started. The better your information, the better your methods, the quicker the reprieve. Research and uptake are so important.

The costs are ongoing in time, $'s and stamina on the individual enterprise and far reaching into the community. Years after a wild dog has attacked and killed, the farmers involved will retell it as though it has only just happened. The impact is that great. It absolutely undermines the family, the community and the region, as well as the enterprise.

Whatever the invasive animal and whatever the enterprise, it is my personal opinion that to understand the social drivers, it is important to gain an understanding of that enterprise and the invasive animal impact on the person, the family and the community, remembering that no two situations are identical. To educate all agencies and landholders will build long term cultural changes that create an ongoing solution, all stakeholders need to own equal positioning in that solution.

References

ABS (2006) Australian wool - financial performance of wool producers, Financial Performance-specialist sheep and wool farms.

Presentation Summary[10]

Social Research and the Invasive Animals CRC

Steven Lapidge
Uptake Program Leader
Invasive Animals CRC

Proposed Outcomes of the Invasive Animals CRC

1. Reduce impacts of canids by 10% Australia-wide ($29M).
2. Reduce feral pig damage by 15% ($16M).
3. Reduce rodent damage by 20% ($7M).
4. Improved water quality through reduced impacts of carp.
5. Reduced impact of feral cats over 5 Million ha.
6. More integrated rabbit control.
7. Reduced risk of disease transfer from pests to stock and humans.
8. Reduce new pests and stop existing species expanding.
9. Grow pest animal control industries.
10. Increase professional and practical skills base.
11. Established benchmarks for invasive animal impacts and gauge success of IA CRC.

Uptake Program Summary

1. Demonstration sites

- Research & demonstrate IPM in different social and technical settings.
- First 'port of call' for new IA CRC products and strategies.

2. Community dialogue

- Demonstration site social benchmarking and monitoring, workshops, product integration, engagement on ethical issues.

3. Commercialisation

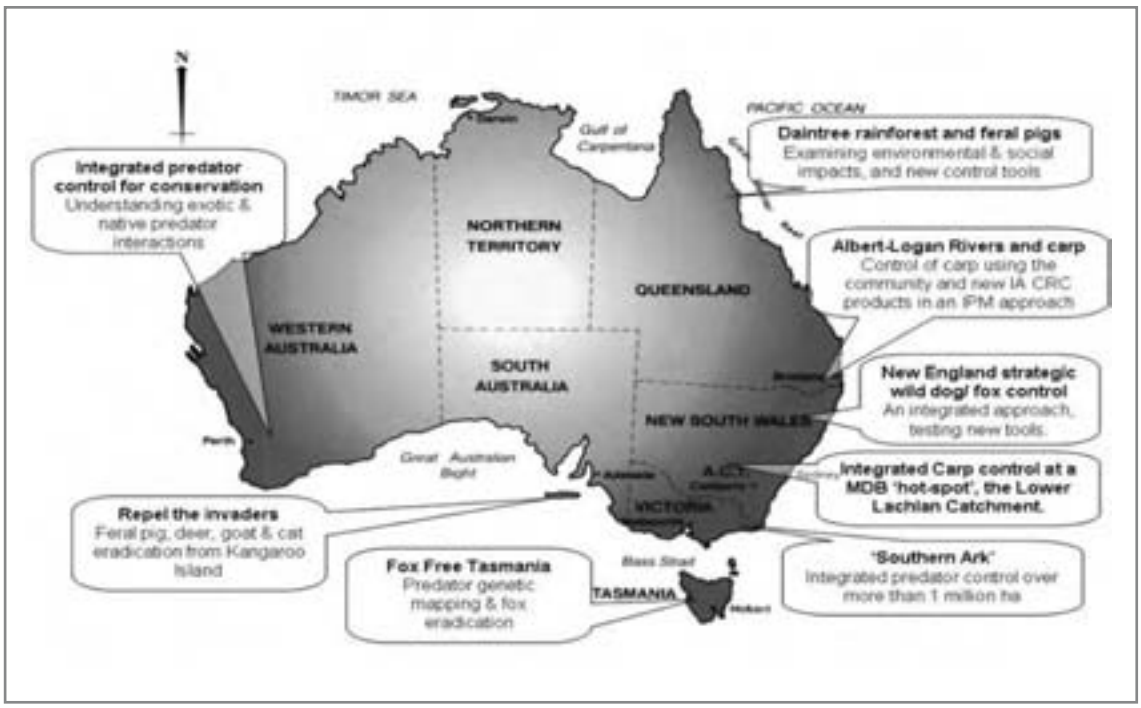
- National and international registration/commercialisation and uptake of new products and strategies.
- Assist industry to address problems of market failure.
- AIA Offshore - Actively seek overseas markets for IA CRC products and services.

Demonstration Sites

Currently there are 8 demonstration sites within the Uptake Program of the CRC (Figure 1).

10 A presentation to inform the following discussion about social research and the CRC.

Figure 1: A map of Australia showing the location of current Invasive Animals CRC Demonstration Sites.



Questions for consideration

1. How do we maximise the achievements of the IA CRC at Demonstration Sites – our key areas of social interaction – and other sites?
2. What is the best way forward in product development and integration?
3. What drives/underpins success or failure?
4. How do we measure social success or failure?
5. What synergies did we identify yesterday?
6. Where to from here?

Current 'social' projects within the CRC

1. Benchmarking at the Demonstration Sites (Guy Ballard)
2. Community perceptions of Foxes in Tasmania (ValueMetrics)
3. PhD project – Pigs in Rainforest (Carla Meurk)
4. An Australasian Review of Social Research in Invasive Animal Management (Fitzgerald Applied Sociology)
5. PhD project Socio-economics and Southern Ark (advertised but no student found)
6. Education Program
7. National Benchmarking of social impacts
8. PhD project – Social and economic aspects of wild-dog control
9. Potentially: A National audit of attitudes towards control techniques

Discussion: Is there a gap for social research to fill, within the CRC?

Lloyd Kingham: So, the question is, 'Is there a gap for social research to fill, within the CRC?'.

Frank Vanclay: The first thing is that you said (*re Steve Lapidge's presentation, see p55*) that this is an 'Uptake Program' but then you said 'research'. The first thing I'd say is that uptake and research can be, and perhaps should be, different.

Lloyd Kingham: Should be different?

Frank Vanclay: Yes. In fact, what I'm about to say isn't about research at all. The gap for me is that you don't have anything about contributing to a policy dialogue. You've got community dialogue but you don't have how you are going to influence the policy discussion. There's quite a bit in extension about changing the regulatory environment and changing all sorts of things that are in a higher level. So, particularly for this CRC, I think there's a real need to have a person who engages at a political and government level.

Steve Lapidge: I think that's an excellent point Frank and we do have that in our partners with state agencies, with DEH being a partner, with lobby groups like WWF and things like that, so we do have key policy people there.

Lloyd Kingham: Which Program does that relate to?

Steven Lapidge: That's right across the CRC. So there's no particular Program. That's what many of our partners are there for. With groups like the AVA they're not there for the research, they're there to help make a difference.

Roger Wilkinson: It may be that some of the issues brought up don't fit within the Uptake Program. They might fit better in some other Programs of the CRC.

Lloyd Kingham: Which are?

Steven Lapidge: For example some of the work that Roger and Gerard have been doing includes work for the Detection and Prevention Program. I'm not sure whether there's anything in the Terrestrial and Freshwater (*Programs*) but of course there is some in the Educational Program as well. Although they're all integrated, they're listed as separate programs within the CRC. So there is research going on in at least two other programs of the CRC.

Roger Wilkinson: My reasoning for saying that is maybe we shouldn't feel bound to try too hard to try to fit into that structure (*i.e. referring to the Uptake Program outline presented by Steve Lapidge, p55*). If we can find some social research that could be useful for a CRC involved with invasive animals then let's not get too worried about the structure and where it should sit at this stage. Let's think up some good pieces of research and then Steve (*Lapidge*) and Tony (*Peacock*) and whoever else can decide where it can fit into the CRC later.

Tony Peacock: The line I always use is that, if we go to the CRC outcomes (*see p55*), if we are going to pay for something then I need a thick black line pointing to one or more of those and then where it fits in terms of programs they're sort of dotted lines. I wouldn't get bogged down in which one of those it fits.

Frank Vanclay: My other reaction on this (*re Steve Lapidge's presentation, see p55*) was that there is a lot of emphasis on Demonstration Sites. Not only is there, number one, demonstration sites but, number two, it strikes me that you need to do more than just demonstration sites. Again, a lot of extension, in the past, has shown that farmers have varied views of how appropriate demonstration sites are. Although it has been a standard method of extension in the past it is not always clear from the evaluation of extension that demonstration sites are good things or not.

Lloyd Kingham: Are there any other comments on these points?

Frank Vanclay: There are other ways to get 'uptake' and influence the public. Uptake from my perspective isn't something that happens from a linear line of communication. Uptake happens from a complicated set of interactions. The demonstration site model is too much of the linear uptake model of extension that fails.

If we go the outcomes (*see p55*) there is an impressive set of outcomes which is really good because it is clear what you want to achieve and this is good because you should always design a project with the outcomes in mind. If you look at the outcomes you should think, going backwards, how would you get there? So for each one of those 11 outcomes, what you should really do is some kind of strategic planning, backwards, to say 'what other different things do we have to do in order to get there?' And when you do that in good way, that's when you know whether the demonstration sites will be a good thing or not.

I'd suggest to you that there are many other things that you should be trying in order to achieve those things. There's much more you can do in order to get there.

Steven Lapidge: And I suggest there is much more that we are doing to get there, as well.

Tim Smith: Other CRC's have struggled with this as well, with management study areas. I mean we've got two other examples of terminology around the country. What have you got that you're going to be measuring? If you are going to be looking at social science research questions then there have to be things that will enable those things to occur. It's really important to think about that idea of what you are going to achieve. So for the social research as well it perhaps needs to be better tied into the general research program. There are loads of different kinds of social research questions you could try to answer.

Frank Vanclay: The outcomes are really only measured in terms of biophysical and economic outcomes. The social science outcomes really aren't there. Potentially there could be some brainstorming about what the social science outcomes would be. Whether or not you try to achieve those is really a different question. Having things like 'An increased awareness of the issue'...

Tony Peacock: These things are locked in and it's worth pointing out that, in getting a CRC, that 'research' is not in the selection criteria. You get a CRC to improve the economic growth of Australia. They say 'if you want your environmental research go to the CERF program'. If you want pure social science research you have to go to the ARC program.

Frank Vanclay: But that's not what I'm saying. To achieve this (*i.e. the CRC's listed outcomes*), what other social science outcomes are there that you need to consider?

Lloyd Kingham: That's an interesting point. Well let's have a look at number one (*see proposed outcomes for the CRC, p55*). What are the social research needs to achieve this?

David Russell: Whether you're not going to achieve that. I reckon that unless you get problem ownership you won't be able to have any impact.

Lloyd Kingham: I guess for me, in terms of invasives' 'impact', you need to be able to work out amongst your community what's important in terms of impact and what they see as measuring them.

Tim Smith: Can I ask a question? What is the bio-physical science question you're asking to answer that? Because I'd like to see how that's phrased before we look at the social science.

Lloyd Kingham: Can someone answer that?

Steven Lapidge: It's the better use of existing tools such as baits and traps and lures. It's also introducing new tools and also working out pest strategies for implementing these tools. That's what the on the ground research is about.

Peter Fleming: There is also work on ecology and things like movement and behaviour so we know where to put baits and traps. We also want to know what the community thinks about these things.

Tim Smith: So it's really about understanding the impact rather than trying to reduce the impact? I like to use the phrase of 'enabling outcomes for achieving goals'. That's the terminology we use in our work in northern Australia. In order to achieve on-ground outcomes, then, you need to look at the things that underpin those outcomes.

Lloyd Kingham: Okay. I'm going to build on Tim's point there. What would the outcomes of social research enable the CRC to do? Give me some quick answers.

Gerard Fitzgerald: Can I make a distinction between applying existing knowledge and social research? If you're trying to collect new information, what do you need the information to be about? What is the task that you imagine social scientists will be able to do for you? I think there are two generic tasks: the first one is to try to understand why people resist your idea, whether it's a technology, a strategy or your notion of something as a pest. Why do people resist that? And associated with that is, is there a tool to get people to change their mind, their views or attitudes?

Now that is one side of things. The other side is how do you get people working together on a common goal, objectively, over a sufficient period of time to achieve that goal?

Now where is the research? Those things have been researched over and over again. There is an extraordinary amount of work that is gone on in natural resource management in the social fields, the extension fields... The psychologists have endless amounts of stuff on how people learn, why they learn things, and so on, and that there is umpteen different models of each of those sorts of things. There are those answers, out there, to these questions. So I'll ask again, what research do we actually need? Are we looking to research at all in the social sciences?

Chrys Horn: Surely there's action research because the issue, in New Zealand, is not that we don't know what to do but that we don't know how to do it. How do we use it on the ground? That requires research in itself, actually.

Gerard Fitzgerald: Well, I think there's information out there about how to do it. Work has been done on what works and what doesn't work in Queensland, and its great stuff. How many times do you have to do that to find out? I think we have to take those lessons and assume that work has integrity, and that the results are reasonably robust, and apply them to the doing of the changes that you want. The changes are getting people to think the way you want them to think. Let's assume that you have good thoughts… that your intentions are good. The second one is how do you get people to work together for good results? What are the rules? Now that's the application of that knowledge, so from a research point of view I'm not sure what I can contribute. I can research all of this exercise as a social research project… The management of pests as a socio-cultural process is an interesting topic from a research perspective and maybe that picks up some of the action research questions that Chrys is suggesting. Now for me, I'm not sure how I can help the CRC in terms of 'how do I get people to think the way I want them to think?' Maybe if I was an advertising executive I might be able to advise you about that, you see?

Carla Meurk: I think that the way that social research fits in is in actually defining the problem.

Frank Vanclay: My contribution to the discussion is to remind people of the word 'capacity-building'. How it relates here is that I don't think there is actually much social research to be done. What there is, is a need for the application of social science techniques and processes. There is actually not a need for social research but a capacity building program. The problem is that there's not many applied social scientists in Australia, that is people who are available to do applied social science. This metaphor of capacity building can be extended in various ways. There is a huge lack of capacity. So what you need to do is to have a capacity building program to improve the capacity of social science among people at decision-making levels… increasing awareness amongst all the physical scientists within the CRC about why social science is needed, and capacity building at the national level to increase awareness about invasive animals and their impacts, but I'm sure there's a few more. Potentially the way I see it is that you need the social science capacity building program rather than a social science research program.

Carla Meurk: Essentially what you're implying is that the application of social research isn't research…

Frank Vanclay: Well it isn't research because it isn't answering a research question.

Paul DeTores: One of the key messages for me is that biological scientists and managers are largely ignorant of the role that social scientists can play and how they can contribute to what we are doing. So instead of going to a research program with the attitude of saying that 'we want people to support our research' we should be asking, 'is what we are doing appropriate?' and 'if not, what can we do about it and how can we involve you more in the research program?'

Gerard Fitzgerald: So: 'Are we doing the right thing?'

Paul DeTores: We need your support to tell us how we can integrate social aspects with the science because as biologists it seems clear to me that we are unaware of the potential for social research to help us. We need to know whether we are doing, or thinking about doing, the right thing. How can we be sure that we are doing the right thing if we don't know what the community believes?

Gerard Fitzgerald: I'm making the distinction between social research and the application of social science to achieve the various outcomes. I think that Frank's point about capacity building, and taking the social science knowledge that people have and working with the social scientists in this room about how you can go about engaging people… that is possibly what we can contribute to the CRC.

Paul DeTores: Is that a social research issue or application issue?

Chrys Horn: I have to really disagree about that (*i.e. application rather than research*). When I was teaching I worked with a woman who was an educational researcher. I was thinking, 'I'm not doing this right, I'm not achieving what I want to achieve', so we sat down together and we worked out what I might do to, say, improve my capacity, and I used her to help me. She came in and she worked with my students, and she provided me with a whole heap of information that came from other work that she had done with other teachers. She was building my capacity but she was also doing research; I was a co-researcher in the project. To me that's the essence of action research… it's not just application, it's also research and gaining new knowledge.

Frank Vanclay: I guess I want to raise one thing. I have been involved in many CRCs. The first CRC I was involved in was the CRC for Viticulture in the first round of CRCs, in 1992. We had a social research program and the problem was that the director of the CRC thought that I'd be doing the extension of the CRC. What I thought was that I'd be doing research into extension, not doing any extension. And that misunderstanding persisted for quite a while and that led to a problem with the PhD students because the director thought that the role of the CRC's students was to 'get out there' and do extension for the CRC and it's absolutely not. That's inconsistent with what the role of the PhD is. PhD's are about doing research. The CRC needs to think about how it will resource its outreach or extension program and that can't be through PhD's because that's not what a PhD is.

When you're employing social scientists to do that it's got to be clear what the job description is, and if it's about research then the scientists need to be able to answer research questions but if it's about application then that's different. It's quite important that you clarify that in the job description otherwise there will be grief at the end.

Lloyd Kingham: Let me direct your attention to number three here (*see the CRC's proposed outcomes, p55*). Somebody referred to the dirty term of marketing, i.e. 'get out there and sell it'. Here is an application of social research, 'National and international commercialisation of new products and strategies'. There's the application find out what people want then get in there and sell it to them. What research is required there?

Gerard Fitzgerald: Market research. That's market research.

Frank Vanclay: Market research is basically data collecting to make decisions. It isn't research in the language that Universities understand research.

Lloyd Kingham: It's an application rather than research? I just want you to think about these. Can you think of a project that would inform these kinds of outcomes? For me it would be to hand out a survey about 'What people need in terms of a mousetrap' then sell them that mousetrap. That's basically what it boils down to.

Steven Lapidge: But they may not use that mousetrap and that's the next level were trying to get to.

Lloyd Kingham: So have a fairly simple outcome… 'Why are people averse to this product or these kinds of strategies?' It may be that you build on that with some other kind of project similar to this kind of thing. It's been spoken about a few times now, for example, that there has been quite a bit of time and money spent on stopping foxes breeding but we didn't ask people if that's what they wanted or needed in terms of control…

Steve Lapidge: Can I point out that not everyone will actually purchase a product that the CRC is developing? A lot of city people are in different groups that can very quickly block anything that we are developing. We want to know that upfront. The city people may not purchase it but they have a vote in what their country counterparts can actually use. So that goes beyond more than just market research.

Lloyd Kingham: For the purists in the room do those comments relate to application or to research?

Frank Vanclay: I guess I'm one of the purists aren't I? I guess there's research potential there if you say 'can that (*i.e. assessing whether people will block the uptake of a product*) be done more effectively?'. It's research when you ask 'Is the model we're using effective or is there a better model?' If you don't ask those questions then you are only doing application.

Lloyd Kingham: What we've seen over the past 2 days are several models for moving forward. What we need to do now is choose which model is the best one from making progress. So do we take several of those models and test them across different demonstration sites?

Mark Williams: Can I give you an example from South Australia that's not from one of the CRC's demonstration sites? I estimate, subjectively, that we still have around 20 or 30% of landholders who will not implement rabbit management. We need to know whether it's a lack of understanding… whether a combination of science and extension is required. You'd think that after 20 or 30 years of running a project like that that we'd be getting somewhere.

Lloyd Kingham: Is the solution a research project or is it just using information from a previous project and seeing what happens?

Mark Williams: We've got the technical solutions. We just aren't achieving the on-ground results.

Lloyd Kingham: Mark, you've sat here for a couple of days now. What have you got in mind? What do you reckon should be done?

Mark Williams: Our main problem is that we haven't got the capacity to do the sort of things that we're talking about here. We've basically got our technical policy group. But that's it. We've got the technical stuff down. We think we've got the policy stuff okay but it's the social drivers and understanding of social issues that are obstacles to using the technical stuff.

Lloyd Kingham: So what's your preferred method of finding out what those obstacles are, based on what you've heard here?

Mark Williams: You mean a preferred model?

Lloyd Kingham: Yes. You're thinking, 'Why aren't these people taking this stuff on board? There's something that we have to work out to know why this is going on.' So, when you walk out of your office, what are you going to do?

Mark Williams: Maybe if we use this area like a demonstration site we can work through the social context and interact with landholder groups, look at how policy overlaps and we might come up with a better model that we can apply in that area.

Lloyd Kingham: So we've identified a problem that we need an answer for. You reckon that we can use the demonstration site approach to provide you with people who do some of this work (*i.e. social research/application of social methods*) and your idea is to sit down with these people and work out how policy affects what's going on, plus identify a few other drivers. Then what would happen?

Mark Williams: That would depend on the gaps that were identified. We might need to have a training program or something like that.

Lloyd Kingham: And do you think the outcome you were after would be a much lower figure of non-uptake?

Mark Williams: I guess so but if you look at some other CRC outcomes then I guess it might also be a reduction in the level of impact.

Frank Vanclay: The other outcome is that you might have actually been focussed on the wrong problem to begin with. 30% non-uptake might be the best figure you could get.

Mike Braysher: That's right. You might be able to bring all your experience in social research together and say 'Well, you're on the wrong track here. You're tackling the wrong problem.' That's why it would be good to have social researcher sitting on your shoulder saying, 'You're never going to get there. This is what you can do or should be focused on.'

Gerard Fitzgerald: That's what uptake shows you anyway… that there's never going to be 100% uptake. How many people out there don't have a video recorder of some sort? Its great technology, yet some people choose to not even have a television set. So, from a marketing point of view, yes, there are always going to be people who won't do what you want them to do. That's the reality of the world. Maybe 30% non-uptake is the right number for rabbits, or for integrated management of rabbits. Maybe about 70% is right for GMO's. And no matter how hard you bang away at it, you're not going to make a difference.

As an applied problem, if you think that you've got the mousetrap, or the rabbit trap or the integrated management strategy, then you want to know 'why isn't everyone using it?' I think that's a perfectly reasonable question to ask.

Lloyd Kingham: I'm not going to walk away from this. This is helping us to congeal our thoughts.

So Mark, what is the question that you want to ask?

Mark Williams: Why don't the 30% of people do what we want them to do?

Lloyd Kingham: Frank, what was the alternative question you want to ask?

Frank Vanclay: What are the legitimate reasons for not adopting what you want them to do?

Damian McRae: Can we confirm why the 70% do actually do what you want?

Gerard Fitzgerald: What are the differences between users and non-users?

Peter Fleming: Have we got enough people doing what we want, to get the job done? If 70% is enough then how can we maintain those levels?

Chrys Horn: What is uptake? How do you measure it?

Roger Wilkinson: Yes, are the people who sometimes do what you want included in the uptake percentage?

Peter Fleming: So maybe we are talking about the degree of uptake?

Frank Vanclay: What do we need to do about the 30%? What motivation, or incentive, or regulation is needed? What blend of policy instruments is needed?

To help explain when different policy instruments, such as incentives or regulation are required, Tessie-Tumaneng Diete re-visited Pannel's (2006) economic model (*see Wild dogs in Queensland: social and economic issues, p34*).

Lloyd Kingham: What other questions have you got?

Carla Meurk: Will the 30% make a return of any sort to the outcomes we're looking for?

Mark Williams: Will it address the fundamental problem in pest management of whether there is a relationship between abundance and pest damage? From a policy point of view where do we keep driving the population down to get to that break-even point? So far, we take a 'zero-tolerance' policy so if there are any rabbits out there then we consider that there's an impact to the community.

Greg Mutze: So there are levels of impact and there are levels of uptake. So what level of uptake do we require to reach the level of damage mitigation that we need?

Peter Fleming: The other important thing is training. You can know where people are before you can try to train them to get to a certain level. Do you need to try to train them or are they already at the level you want?

Frank Vanclay: You need to keep in mind the concept of a target audience. One of the ways in which you can manipulate that 30% figure is to redefine your target audience. Sometimes when you are looking at why you get say 30% non-uptake in your target audience you realise that some of the people you're talking to shouldn't really be part of your target audience because their characteristics are different. So a re-evaluation of your stakeholders, in terms of whether or not the application you're trying to promote is actually applicable in the first place, can have a big bearing on those numbers.

Tessie Tumaneng-Diete: There is an economic question here. Are there are enough funds to go around to achieve all of your pest management objectives? The question here is, from a policy point of view, how much money is required to turn the say to 70% uptake into 71% or more? Will it cost more than getting another outcome from another program?

Mark Williams: Another thing is that there's an interaction, a complex interaction, between the pest animals and the policy and the outcomes, but none of us understand it completely. So how do you come up with policy that will allow you to balance the pest animals' impacts and the outcomes you want?

Chrys Horn: At home (New Zealand) we wouldn't call the impacts an outcome, we'd say we've improved biodiversity, or reduced attacks by dogs on animals on the farm, or something like that.

Mike Braysher: That's where the outcome is increased productivity, or increased numbers of native wildlife. That's what your outcome is.

Tessie Tumaneng-Diete: The impact you are talking about there is not just economic. It's a triple-bottom-line issue.

Mike Braysher: It's lifestyle as well.

Frank Vanclay: It's a triple helix (*This was a reference to a point made in Frank's presentation, about Andrew Campbell's concept of a triple helix of landscape lifestyles and livelihoods*).

Lloyd Kingham: So there are a number of technical and social research questions that we want to answer. This is where we've come to since yesterday morning. We've had a look at these indicators and we've had a look at the outcomes that the CRC is after and now, thanks to Mark, we are actually starting to have a look at how we would apply them in an actual situation. There is a heap of stuff, in terms of social research, that we are already doing. We have to look at our problem of what we want to do, say, improve uptake for integrated rabbit control as a key outcome of the CRC. What they (the CRC) want to put against that outcome is an increase in uptake. That is what the funders want. What you're saying though is from those higher order questions, 'do we need to redefine who we are asking about these questions?', 'would it make a difference if we got increase uptake?' So what we need to know is, 'is there a critical mass, in a critical demographic, that we need to take up the strategy, that would be enough?'

The good thing about it is that we are actually looking at it from a triple-helix perspective. So is this really giving us what we want? If those indicators aren't close enough to what we really want, is asking these questions giving us a better understanding of where it is that we need to invest our actions? And, is answering those questions giving us a better idea of whether we are winning or not?

So, all of these questions are for the people who aren't taking it on:

- 'Why are they doing it?'
- 'Do we have a good understanding of that?'
- 'How would we do this?'

Any ideas?

Tessie Tumaneng-Diete: A community survey

Carla Meurk: A qualitative approach.

Guy Ballard: Yes, you might use qualitative research if you were interested in developing an understanding of the issues, not just the distribution of particular views within a community or communities.

Mark Williams: One of the big things that came up from this workshop was that, for the ecology people, you could actually watch that process happen.

Lloyd Kingham: I'm going to call that a 'paired-survey technique'. Where you (*e.g. an ecologist*) work with an expert (*i.e. social scientist*) to get the information you need.

Kath Williams: I was going to say that what you're doing is asking people about deviant behaviour.

Frank Vanclay: Universities are going to have problem with you asking people about illegal activities

Guy Ballard: That's right. Typically you're supposed to tell people not to talk to you about illegal activities in case you are obliged to report it or to provide evidence against them later, but that could be the very stuff you're interested in. So, as a researcher, you find yourself saying 'Don't tell me about any illegal activities' but hoping they'll tell you about their relevant, illegal activities. I had that experience when working with commercial fruit growers about Flying-foxes.

Lloyd Kingham: The question we come back to for the CRC is should an investigation of the community be routinely done and if it is done who funds it? Who does the quality-control?

Gerard Fitzgerald: Going back to the rabbit issue, the question is that despite the possibility of having to be confronted by the law there is still a group of people who choose to do nothing. Now is that actually the group that you're interested in?

Mark Williams: It's not just people that do nothing. Sometimes it's people who only made some effort. We have a whole heap of people in the marginal lands who go out just once a year, spread some bait around their boundaries and say ' I've done enough'.

Peter Fleming: I'd say that the 30% are probably not going to be your biggest problem because they have been forced into doing something… they've probably got the more effective control. It's the other 70% that you then have to go and look at.

Gerard Fitzgerald: You're not talking about pests. You're talking about people, and regulation and the effectiveness of regulation. And what your problem really is, is the cost of policing. Whether it's people policing the wearing of crash helmets on bicycles or looking after rabbits. If you really cared about rabbits it's not about the percentage of uptake but about how many rabbits there are at the end of your program. The question is 'how many rabbits are there? How many rabbits have you got rid of?' End of story.

Greg Mutze: No, the question is what impact are the rabbits that are left having? That's what we are really concerned about.

Gerard Fitzgerald: Perhaps a key question is, 'is the impact that the remaining rabbits are having important?

Frank Vanclay: The point I want to make now is that we need to be reflective about the strategies that we use. Because if you use the wrong strategy it can actually backfire and using regulations against groups of resistance is one of the reasons that science doesn't have automatic legitimacy. We live in an iterative world. We can't just act in relation to specific problems. You have to consider 'what are the implications of my strategy?' Regulation is usually a last resort strategy.

Lloyd Kingham: Do you want to ask these people (*non-compliers*) that question? Where are you going to find that out?

Frank Vanclay: No, but it's something we have to be mindful of always. All of these questions are actually more complicated than just asking the questions, and all of these questions interrelate with each other.

Carla Meurk: What you've also done by using regulation is that you've established a history of antagonism towards Government.

Frank Vanclay: The way I'd express it is that if you go back to that idea of a blend of policy instruments, you have to be mindful of what the costs and benefits are, in the long term, for each instrument that you might use.

Tim Smith: Context will also be important. Is there a history of using a particular policy instrument in an area that might be affecting the situation?

Frank Vanclay: It is like the native vegetation clearing issue in Queensland. Why is there so much resistance? Because people are very resentful of these rules.

Lloyd Kingham: How do we measure resentment?

Carla Meurk: To accept the legitimacy of non-adoption, shouldn't we be thinking about we can have multiple solutions?

Tessie Tumaneng-Diete: I think, too, with this one, that we are assuming that it is the landholder who is at fault here. Maybe another way of looking at this is, 'Is the policy right in the first place?' Have the policies changed with changes in science, in people, in the landscape? A lot of our policies still date back to the early 1900's. Are they still relevant?

Greg Mutze: Time scale is important too. Yes, as I understand it the rate of vegetation clearing has accelerated following the legislation that was introduced, making it illegal, but 100 years down the track, will you have more native vegetation left with the legislation introduced than you would have without it? What we're seeing now is a reaction to the legislation. People are sitting on a block of land saying 'I bought this land to clear it. The government is not going to let me do it. I'm going to do it anyway.' But it may be, in the longer term, that we end up with a far better result.

With the legislation that was introduced to enforce compliance with rabbit control, it was very effective in the early stages, in achieving a high level of uptake in the community because examples were set that showed other, non-complying neighbours that wasn't really an option. They then started doing rabbit control, found that they were better off having done it and it actually got the ball rolling.

Frank Vanclay: You can regulate when you have legitimacy but with the Queensland example the regulation is not legitimate, they don't accept it.

Lloyd Kingham: Does anyone have any more comments about this?

Frank Vanclay: One of the things I've tried to emphasise this morning is how important good process is. There's a lot to be done here, and everyone can see the benefit of a social process to learn about all of these but it still comes back to the question of 'Is it research or is it application?' A lot of the unpacking that we've done in this explosion of questions, it seems to me, is still routine, and unless you go beyond the routine it's not research.

In fact the nice little buzz-word is triple-loop learning. We know what learning is and we're all learning. So that's learning. When we learn about learning, 'How can we improve our learning?' that's double-loop learning. But triple-loop learning is 'How can we learn about learning about learning?' If we do all that (*answer the questions posed during the discussion*) then that's fine, its like learning and the CRC needs to do all that, but that's not research. Research comes when you do the second, the double, and the triple-loop.

When you learn about learning about learning, you'll always learn better. It's like reflective practitioning. If you're a good practitioner, you'll do things, but you'll be a better practitioner if you reflect about the things that you do and try to learn how to do your practice better.

Mike Braysher: I accept all of that but from the point of view of the CRC we have a number of technologies and strategies that we are concerned about and we want to know 'Do people really need to do it?', 'Why aren't they doing it?', 'How can we help them to do it?' and if we ask those questions it is going to bring us up enormously from where we are now.

Frank Vanclay: Wouldn't an ecologist say we can apply this ecological knowledge to solve these ecological problems but it is more important to actually expand our knowledge to doing further research. What the CRC is doing is ecological knowledge beyond what is needed to solve the problem, and that is what is needed in the social sciences.

Lloyd Kingham: I suspect the decision we've come to this morning is that what the CRC is after is no social research but ideas about how to apply it to existing projects. I am yet to be convinced that there is a will of the people otherwise.

Worksheet Summaries

Workshop attendees were formed into groups and then asked to reply to a series of questions. The obtained responses, presented by group, are listed below.

Group One

What are the current social drivers for successful invasive animal control?

- A clear understanding of issues
- Local ownership
- Proper resourcing
- Self-interest (among stakeholders), i.e. through an offer of improved quality of life, higher income, lowered stress and more recreational time

What are the indicators that can be used to measure the success of these drivers?

Indicators of success will be dependent upon the specific objectives

- A measurable reduction of impacts
- A measurable avoidance of impacts, e.g. where eradication is both desirable and possible and is the objective of control.
- Improved quality of life, measured by increased income, increased recreational time, reduced stress

What methods can be used to collect the necessary data for these indicators?

- Various methods may be employed
- Both anecdotal and systematic-scientific approaches will be necessary because a variety of values exist among stakeholders
- It is important to note that there may be important differences in inquiry technique between face-to-face interviews, focus groups, telephone questionnaires or web-based inquiry
- Data collection has to be designed to account for participants motivations; the motivation may be unknown
- This last point is especially important if participants do not trust the people surveying or advocating a control issue

What are the useful lessons that can be drawn from social research experiences, across natural resource management, to benefit invasive animal control?

- There are many reasons (some of which are surprising) why people do or do not become engaged in management.
- There may be a much more personal impact on people than casual observation reveals. Some impacts can be private/secret
- Representation or simply giving information, by managers is not equivalent to engagement. People may perceive this approach as demonstrating a lack of responsibility on behalf of managers.
- In terms of landowners and agency representatives there is often much in common, e.g. personal stress over conflict
- It is important to match the degree of engagement with participants' motivations and limits.

What are the potential applications of these lessons?

- If one type of inquiry provides more accurate data then research should concentrate on using this option

What are the indicators which can measure the success of adopting lessons from social research in natural resource management?

- The degree to which actions are taken up by communities
- Demand for more agency involvement/programs by stakeholders

Group Two

What are the current social drivers for successful invasive animal control?

- Agency-community relationships are important. There needs to be agreement in terms of what the goals and problems are.

What are the indicators that can be used to measure the success of these drivers?

- Process/input indicators
- Views on success of process
- Levels of participation by stakeholders who agree of goals/participation
- Sustained interest over time
- Actions of people
- Evidence of reaching goals

What methods can be used to collect the necessary data for these indicators?

- Stakeholder analysis conducted through meetings between agencies and stakeholders
- Surveying to see what people see as goals
- Conducting longitudinal research

Additional feedback:

Requirements for supporting/mandating institutions:

1. Capacity to work with stakeholders (individuals, organisations)
2. Resources
3. Power
4. Political will
5. Multiple modes

Strategy:

1. Agreement that there is a problem
2. Agreement about the nature of the problem? Is it:
    - a production issue?
    - a conservation issue?
    - a safety issue?
    - a human issue?

3. Agreement about the goal. Do we:
    - Control or relocate or eradicate the pest?
    - Minimise/mitigate the harm being done?
    - Protect or relocate what's being threatened?
    - Maintain ecological balance or seek/accept an alternative state?
4. Evidence-based decisions
5. A sustainable implementation plan. This requires:
    - Research
    - Resources
    - Acceptable methods, i.e.
        - Safe with foreseeable risks
        - Specific
        - Ethically sound
        - Humane
        - Affordable
        - Have multiple benefits
    - Action and implementation
    - Feedback – for learning

Individual motivations and characteristics of importance:

1. Values, beliefs, attitudes
2. Demographics
3. Perceptions of self and others
4. Knowledge and experience
5. Social connectivity
6. Resources (social, financial, physical and natural)

Group Three

What are the current social drivers for successful invasive animal control?

Stakeholder and manager perceptions

Ownership of problems and solutions

Empowerment of stakeholders

Understanding and using information about reasons that people don't support particular management options

Increasing understanding and application of need for better process rather than 'discrete' solutions

What are the indicators that can be used to measure the success of these drivers?

A baseline measurement of perceptions, for comparison at later times

What methods can be used to collect the necessary data for these indicators?

Qualitative investigations to improve managers' understandings re stakeholders and therefore situations

Quantitative studies to map distributions of qualities identified through qualitative research

Monitoring participation rates over time, at various scales – are they maintained? Why?/Why not?

What are the useful lessons that can be drawn from social research experiences, across natural resource management, to benefit invasive animal control?

Useful learning and extension models already exist

Target setting needs to be realistic (in terms of social capacity as well as other resources)

Managers do need to listen to and respect the various stakeholders involved in management

Managers don't need to be overly simplistic in setting targets; stakeholders are more capable than they are often given credit for

What are the potential applications of these lessons?

Development of social and economic understanding, not just biophysical

Setting and meeting realistic targets for management

Group Four

What are the current social drivers for successful invasive animal control?

Increased abundance and diversity of native fauna

Economic impacts

What are the indicators that can be used to measure the success of these drivers?

Community attitude

Number of community groups

Number of projects

N.B. if you measure outcomes alone it misses the enabling factors involved, e.g. social capital. There is too much focus on condition change to assess success. This needs more focus on social change but people have the wrong skills, e.g. technical skills,

What methods can be used to collect the necessary data for these indicators?

What are the useful lessons that can be drawn from social research experiences, across natural resource management, to benefit invasive animal control?

Change is not linear, it's iterative

Most reasons for not supporting or taking part are rational ones

There are cultural barriers that may arise that we cannot anticipate

As for extension, there is unlikely to be a one-size-fits-all answer for invasive animal control

Control strategies may not be considered sensible enough to be worthy of adoption

Level of knowledge is critical for effective decision-making

Norms are influenced by individual values

Minority views can influence outcomes

Personal relationships affect group dynamics and decisions

The basis of decision-making is shifted from technical or evidence-based to values or social-based

What are the potential applications of these lessons?

Recognizing from research what works and what doesn't

Applying known principles that work in extension

What are the indicators which can measure the success of adopting lessons from social research in natural resource management?

Current constraints for successful invasive animal control?

Historical cultural practices

Key community members can impede participation

Invasive animals as a resource, e.g. for indigenous communities

Emotional attachment to species

Varied use of land between different stakeholder groups

Lack of information/understanding regarding 'what are pests' and 'what are not pests'

Lack of trust in Government/Agency efforts

Group Five

What are the current social drivers for successful invasive animal control?

Community belief that control is necessary

Appreciation and understanding of impacts

Confidence in management authorities

Local involvement with visible outcomes

Ethical acceptability

Belief that 'no action' is unacceptable

A barrier to successful invasive animal control: very small groups in the community with extreme views for example eco-terrorists or animal liberationists

What are the indicators that can be used to measure the success of these drivers?

Action without bureaucratic involvement

Action

Community acceptance

Dispersed tensions

Invasive animal control

What methods can be used to collect the necessary data for these indicators?

What are the useful lessons that can be drawn from social research experiences, across natural resource management, to benefit invasive animal control?

People trade-off economic benefits with environmental costs

People have community values and will act if feasible or cost-effective

Give people the opportunity to tell their story when emotive issues are blocking intended actions

Emotional involvement is critical

What are the potential applications of these lessons?

The use of visual projections. This could be a powerful tool for the community to discover some of the pros and cons of different methods of control. For example tools exist such as 'NETICA' exist, for setting up systems and manipulating assumptions to change outcomes

Base programs on the cultural context where they are operating not just on scientific or environmental facts

What are the indicators which can measure the success of adopting lessons from social research in natural resource management?

Uptake across different social groups within a broader community

When a solution is devised and implemented

Applying social lessons to CRC problems

Following the workshop discussion, participants were invited to join one of four groups. Each group was tasked with addressing a real-world problem drawn from the CRC's demonstration sites. Project representatives and their respective questions were:

1. Peter Fleming (New England and Wild dogs/foxes)
    - What are the attitudes of different stakeholder's groups
    - How do these affect the management options available?
2. Andrew Norris (Logan-Albert Catchment, Carp)
    - With regard to managers and stakeholder interactions, how do you deal with hidden/ conflicting agendas?
    - It seems that the public have responded positively to the important message about not translocating carp in the Logan-Albert catchment. However, this is not the case for other invasive fish species. Why?
3. Stephen Sarre (Tasmania, Foxes) and Carla Meurk (Daintree, Feral pigs)
    - How do you reduce the likelihood and impact of sabotage to remedial action and monitoring? (Both projects)
    - How do we engage with policy makers to create effective policy for control? (Tasmanian foxes)
4. Mike Braysher and Nina Jenkins (Education to enhance Invasive Species Management)
    - How do we address the teaching of social science awareness to achieve strategic planning for pest animal control?

1. Wild Dog Problem

Situation

- This site covers a large geographic area including the New England region of NSW, the adjacent coastal area and parts of south-east Queensland.
- This area includes many communities, some of which appear to differ significantly in their needs and views of dog management
- The distributions of stakeholders and dogs are not uniform within the demonstration site. Within the coastal strip, for example, affected landholders live within the dog distribution whereas on the tablelands they generally live adjacent to it.
- Since wild dogs' home ranges are generally greater than the size of local properties the scale of management is necessarily also greater than a property's size
- Managers want information about how to deal with different groups within the management scenario.
- What are the different stakeholders' attitudes to wild dogs and what are their general attitudes?
- Are these as different as they seem, between groups?
- Aside from local groups, stakeholders may include individual/organisations in a broader sense, where there is a vested interest in wild dog management, e.g. Australian Wool Innovation, Meat and Livestock Australia etc.
- Managers have access to lots of data on livestock losses but little data on the social aspects

Actions

- Engage with community to build ownership and demonstrate that action is being taken to address wild dog issue
- Where there are groups who are not engaging in management make an extra effort to determine why this is the case
- Collect information on attitudes towards wild dogs and their management
- Analyse stakeholders' issues
- Consider the role of agents (e.g. DEC, DPI, RLPB) in the process
- Feed information back into management

Team

- Project coordinator
- Ag Protection Officer
- Social Researchers – Guy Ballard, IA CRC plus new PhD student for project
- Also liaise with Queensland researchers/managers working on similar issues in adjacent areas

2A. Feral Pig Problem

Situation – Social aspects of pig management

- Hunters vandalise traps because of a perceived reduction in future bounty (income and ego affected?)
- This willingness to vandalise may affect future delivery of baits, therefore we need to understand the threats to such programs
- Young men (18 – 30) hunt illegally as there is not facility for legal hunting?
- Escapee dogs may also be problematic – are they lost because they are poorly trained? Is there an impact of these dogs on local cassowary population?

Actions

- Describing social environment
- Ground-truthing allegations from discussions
- Establish trust and focus on small groups of people to do so
- Use a snowball approach to gather participants and data
- Produce an options paper exploring judgements in terms of feasibility, interest and the CRC

Team

Carla Meurk, Andrew Bengsen, Iain Gordon, Luke Leung

2B. Fox Problem

Situation

- The release of foxes/fox material (carcasses, scats, fur etc) in Tasmania may be deliberate sabotage of management efforts, environmental vandalism, 'jokes' or all of the above.
- Possible that some of the culprits may be disenfranchised shooters who were not engaged following the arrival of the Fox Free Taskforce

- Suspicion has arisen from original Government policy on foxes
- This suspicion has been further fed by sabotage and a dislike of the Government
- Public mood against 1080 use is relevant. The Government's change in policy on the 1080 issue has prompted talk of a conspiracy

Actions

- Trying to engage with sceptical groups to identifying hidden agendas
- Encourage increased support by politicians for management
- Earn trust and build interest among farmers
- Use newsletter to build understanding progressively about the fox situation and build credibility
- Integrate with management of other species
- Researching management (political framework)
- Media training for all involved staff, being prepared with material (e.g. true stories for release to public when necessary/opportunity arises)
- Use a snowballing approach to contact and understand individuals/groups involved in sabotage
- Need social science/extension advice in conduct of monitoring program and a technical advisory committee

Team

Stephen Sarre, Nick Mooney, Chris Parker, Fox Free Task Force

3. Education Program Problem

Situation

- A regional approach exists to pest management – these groups have responsibility and lots of money
- Many of the former advisory support structures have disbanded (e.g. animal and plant control boards)
- Now there is limited and declining advice available to assist management
- Limited ownership of plans but some NRM officers are keen to undertake strategic planning
- Aim is to build the capacity of NRM officers and other relevant people to work with regional communities to identify pest animal issues and develop and assist with the implementation of strategic pest management

Actions

Integrate social issues across all the sub-elements of a training course for managers. Training in:

- communication skills
- effective listening
- conflict resolution
- facilitation
- networking and relationship building
- social research methods

- behaviour change strategies (social marketing)
- teamwork

Aiming to:

- use role playing
- use scenario modelling
- use real situations
- encourage reflection
- use peer mentoring
- establish a network between graduates
- hire individuals to help develop and deliver social elements of the course
- seek Universities' advice on how to assess this type of content
- pre-test the course on qualified individuals (e.g. from University of Canberra and from elsewhere)

Team

Nina Jenkins, Mike Braysher, Stephen Sarre, Peter Fleming, Guy Ballard, Jenny Andrew

4. Albert-Logan Carp Problem

Question One: How do you deal with hidden or conflict in agendas amongst stakeholders?

With respect to Carpbusters:

- More of a political or management issue
- Look at the history of Carpbusters and changes in their operational goals and attitudes after contact with the CRC
- Record oral history of the club and catchment from various members and external people
- Strategic questioning either individually or in focus groups

In general terms:

- Investigate the nature of community groups before partnering and especially establish clearly their expectations motivations and strength of commitment
- Build social contracts
- Ensure the scale of involvement is appropriate:
  - Can they do what they say?
  - Can we do what we say?

Question Two: Why have extension efforts been successful in stopping carp translocation but not other introduced fish species?

People may deliberately translocate invasive fish species for angling purposes, e.g. as bait, or via the release of ornamental species, e.g. unwanted pets. Why do people do these things?

Extension may not be the issue; other factors may be the driving force also. For example what other options are there for disposal of ornamental fish once they are no longer wanted?

Methods/Questions

Determine the assumptions in the scenario.

- What are the values of ornamental is to different stakeholders?
- What are the properties of invasive fish species that make them desirable to anglers?

Promote the properties of native species that make them as or more desirable than invasive ones. These can be investigated through survey techniques.

- What are the values of people who are releasing the fish?
- Why do they believe they are doing the right thing?
- Do people have adequate information on the consequences of releasing invasive fish species to make a suitable decision?

Conduct interviews with aquarium shop owners who are generally the first port of call for information.

Use telephone surveys to investigate:

- how many people have fish
- what species of fish they have
- what they know about the fish species
- how they dispose of fish and why
- at what point do they dispose of fish

Recruit aquarists for a focus group:

- discuss how actions could be changed
- determine what support people would need to make such changes
- be value and threat free in our approach
- benchmark and then re-investigate regularly
- angling releases and ornamental releases will require different approaches

Question Three: Why are only some fishing club members participating in carp control?

- Are members from both groups going to benefit and will this be equally?
- Do people fish for recognition?
- Do people have a limited involvement in the clubs?
- Are there significant personality clashes within clubs?
- Do some, but not all, members of fishing clubs take part in carp management simply because they provide widespread fishing opportunities?
- Is there an awareness of the consequences of not removing carp?
- Use a survey or interview or focus group for this.
- Utilise multiple forms of data collection to ensure issues are not missed

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