UMCCC Peri-urban Weed Management Study

EXPLORING AGENTS OF CHANGE TO PERI-URBAN WEED MANAGEMENT

JUNE 2010

Darryl Low Choy and Jo Harding

Australian Government
Land & Water Australia

ACT GOVERNMENT

Upper Murrumbidgee
Catchment Coordinating Committee
UMCCC

Griffith UNIVERSITY

Land & Water Australia

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Preface

This project was undertaken by the Upper Murrumbidgee Catchment Coordinating Committee Inc. (UMCCC Inc.), with research support provided by the Urban Research Program of Griffith University. It was funded by Land and Water Australia under the program: Defeating the Weed Menace Research. Supplementary funding was sourced from The National Action Plan for Salinity and Water Quality and Natural Heritage Trust Small Projects.

The project and the case study reviews were guided by an expert project reference group that included key stakeholders in each jurisdiction involved in the themes of the study, especially NRM agencies, state and local governments, and industry.

We wish to acknowledge the support of a number of agencies who supplied data essential to this phase of the project, particularly the Australian Bureau of Statistics, Australia Post, Yass Valley Council, and Palerang Council.

Historical Survey of the Case Study Areas (Report prepared by: Sandra Harding, Research Assistant, UMCCC, February 2008)

Upper Murrumbidgee Catchment
Coordinating Committee Inc

Urban Research Program
Griffith School of the Environment
Griffith University, Brisbane

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List of Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
CD	Collection District
NRM	natural resource management
NSW	New South Wales
PU	Peri-Urban
UMCCC	Upper Murrumbidgee Catchment Coordinating Committee

Abstract

Rural lifestyle landowners occupy peri-urban areas—the non-urban landscape close to urban or regional centres. These landowners do not derive their living directly from their properties as they have chosen these locations essentially for ‘lifestyle’ purposes. Because the rural lifestyle is increasingly popular, the landowners are key stakeholders in future landscape management.

The management of invasive species is of increasing concern to land managers. National and state listed weeds are a particular threat to agricultural production and biodiversity. This study has confirmed that rural lifestyle landowners are often limited their ability to respond to weed issues on their properties. These limitations are due to a lack of awareness, lack of knowledge of the problem, different value sets from those of traditional rural landowners, and a lack of time and resources. It has, however, been noted that this new wave of rural lifestyle landowners tend to be typically well-educated, have high incomes, and value natural landscapes.

To ensure that future weed management strategies are successful in this new and changing rural landscape, management agencies will need to fully engage this critical group of emergent landscape managers.

1. Introduction

A peri-urban area is commonly defined as a ‘zone of transition from urban to rural land uses’ between the outer limits of the urban area and the beginning of the truly rural (reference needed). Truly rural areas are well beyond the reasonable commuting range of urban areas and isolated from urban markets.

Peri-urban areas are generally occupied by rural lifestyle landowners, who have chosen the peri-urban setting for ‘lifestyle’ purposes and do not derive their living directly from their properties. The landowners are key stakeholders in future landscape management of these peri-urban areas. Current research suggest that rural lifestyle landowners may be limited in their response to natural resource management (NRM) issues on their properties, such as weed control, due to a lack of awareness and knowledge of the problems, different value sets to traditional rural landowners in property management, and limitations in time and resources. It has also been noted that this new wave of peri-urban lifestyle landowners tend to be typically well-educated, have high incomes, and value natural landscapes.

Whilst the majority of peri-urban studies have focused on developing a broader understanding of NRM issues, there is little social data on rural lifestyle landowners in relation to land use, particularly weeds, in areas such as the Upper Murrumbidgee catchment. This study aims to address this deficiency. It has been specifically designed to study rural lifestyle landowners in the peri-urban areas of the Upper Murrumbidgee Catchment to determine the drivers to land use change in relation to invasive weeds.

Poor land management regimes have the potential to lead to the introduction of new weeds and to the increasing spread of existing weeds. This can potentially result in a bio-security risk. Consequently, it is crucial to understand how peri-urban residents such as those in the Upper Murrumbidgee Catchment are networked and how information and awareness campaigns can be successfully designed to reach this relatively new and growing community in the non-urban landscape. It is important that catchment-focused weed management strategies and efficient methods for surveying and eradicating emergent weeds consider peri-urban lifestyle properties and the different values, culture and knowledge levels of rural lifestyle landowners.

The results from this research will provide important input into weed management strategies and aid in the development of efficient methods for surveying and eradicating emergent weeds. It will build on the current research from the *Continuity and Change in Peri-urban Australia* project that has very recently been completed by Griffith University and RMIT University and funded by Land and Water Australia.

This study was undertaken by the Upper Murrumbidgee Catchment Coordinating Committee (UMCCC) in association with Griffith University.

1.1 An Extended Typology of Peri-urban Spatial Settings

As a distinct settlement pattern, peri-urban areas form an identifiable 'middle landscape' that is 'not quite urban but not quite rural'. Other terms for peri-urban include the urban fringe, metropolitan fringe, rural-urban fringe or the urban-rural interface, the near-urban, the pre-urban, peri-metropolitan, exurban or urban hinterlands (Buxton et al. 2006).

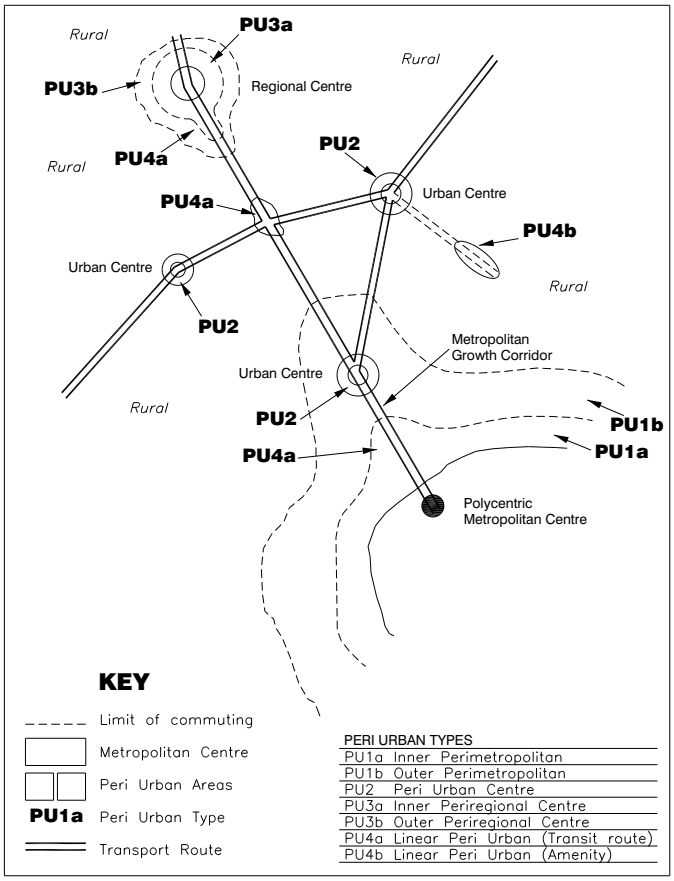
Recent research has redefined the process of peri-urbanisation as 'a dynamic urbanising process that can involve the closer subdivision, fragmentation and land use conversion of former rural lands. It involves high levels of non-metropolitan growth and results in a blurred transitional zone comprised of temporary mixes of urban and rural activities and functions. The resulting peri-urban landscape comprises a range of land use activities that exhibit a high degree of heterogeneity, continual change and conflicting values' (Low Choy et al. 2007).

Past peri-urban studies have focused almost exclusively on the highly dynamic growth that has occurred around the peripheries of metropolitan centres. It was noted that most of these peri-urban areas lay within the sphere of influence of the nearby metropolitan centre and displayed a variety of dependencies on these centres for economic, employment, social and cultural purposes. They were seen as having strong spatial connotations related to the metropolitan centre.

However, recent research has shown that peri-urbanisation can be associated with a range of urban (non-metropolitan) centres, and these peri-urban attributes can be recognised in areas outside of peri-metropolitan regions. If this phenomenon is seen as a process, then it can relate to a number of spatial contexts, many of which will not always be associated with the fringes of metropolitan centres (Buxton et al. 2006, 2007; Low Choy et al. 2007, 2008).

These studies have refined the nature of traditional peri-urbanisation; and this has led to the development of a more definitive and enhanced typology of spatial peri-urban settings. It demonstrates that it can include a range of metropolitan and non-metropolitan landscape settings such as areas adjacent to a metropolitan centre; areas adjacent to a (non-metropolitan) regional centre; areas adjacent to an urban centre within the commuter hinterland of a metropolitan centre; areas adjacent to an urban centre within the rural landscape; and linear contexts along growth corridors, transit routes or

amenity landscape settings such as ridgelines and coastlines. This multi-setting typology is illustrated in Figure 1.



Source: After Low Choy et al. (2007)

Figure 1: Enhanced typology of peri-urban settings

The multi-setting typology illustrated in Figure 1 acknowledges the following four instances of peri-urbanisation:

1. traditional inner and outer peri-metropolitan zones (PU1a/b)

2. urban centres that lie within the commuting zone of a metropolitan centres, where both areas can share a relationship with the nearby metropolitan centre (PU2)

3. in the vicinity of non-metropolitan regional centres, where urbanisation has spilled over into the regional centre's boundary into its surrounding hinterland (PU3a/b)

4. linear development commonly associated with transit routes, growth corridors or landscape settings favoured for amenity and residential purposes (e.g. ridgelines, watercourses, coastlines) (PU4a/b).

1.2 The New Peri-urban Landscape Managers

Low Choy et al. (2007) presented evidence of a wave of new settlers who had moved into these peri-urban areas and are now largely responsible for the management of these freehold peri-urban landscapes. Future management initiatives, especially in the NRM area, will have to engage this raft of new actors on the peri-urban stage. They have been categorised as:

> *The seekers*: including 'tree/sea change' life stylers, 'blockies/homesteaders', religious communities and alternative life stylers
>
> *The survivors*: including DIY home-builders, the horse community, 'truckies', and 'adaptive' farmers
>
> *The speculators*: including farm stays and retreats, the pet industry, boutique farmers, recreational providers, landscape suppliers, the equine industry, and developers and real estate agents
>
> *The strugglers*: characterised by the 'holding-on' farmers.

Future environmental and NRM initiatives will have to engage this full range of new private landowners who have settled into the entire spectrum of peri-urban landscape settings and who now have stewardship responsibilities for increasing proportions of these areas.

1.3 Peri-urban Management Challenges

The *Continuity and Change in Peri-urban Australia* project has shown that the diverse nature of peri-urban areas can present numerous challenges of both a socio-economic and landscape management nature. Understanding the nature of peri-urban change required the identification of the principal drivers of that change. To that end, a range of influential global, national and regional drivers of peri-urban change has been recognised such as:

> *Lifestyles and affluence*: including changing societal values, changing community priorities, and greater access to finance
>
> *Demographics*: including the baby-boomer retirees, an ageing population, and interstate and intra-state migration
>
> *Work arrangements*: involving greater diversity of work arrangements and more flexible leisure time
>
> *Urban housing*: increasing housing costs and decreasing availability of affordable housing in urban areas

Government policies: involving national and state programs (e.g. the Roads to Recovery program) and the implementation of regional plans

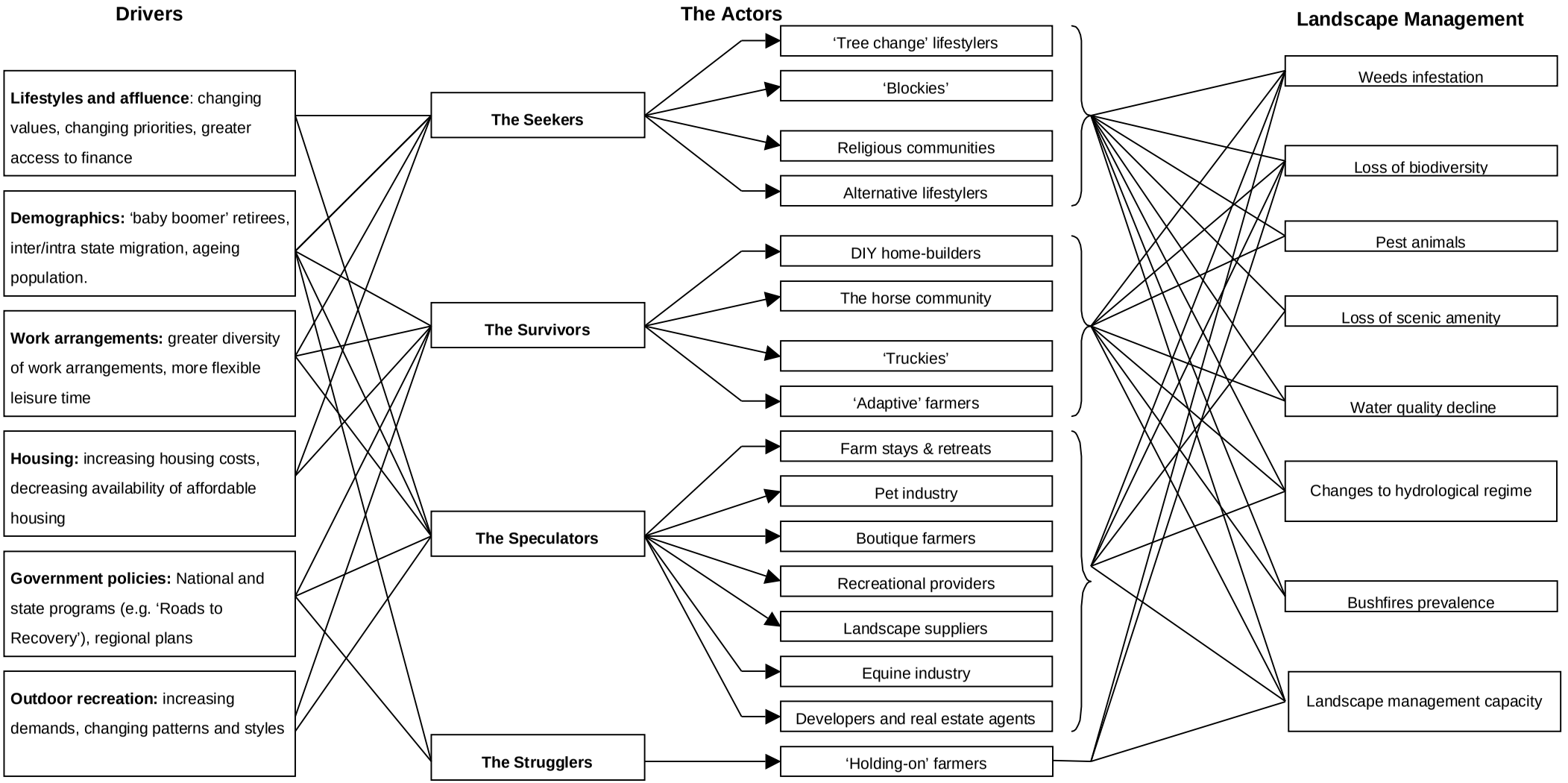
Outdoor recreation: changing lifestyles and leisure activities of urban residents, leading to increasing demands for outdoor recreation opportunities in peri-urban areas (Low Choy et al. 2007).

A range of management challenges resulting from the peri-urbanisation process has been recognised, comprising:

Landscape management challenges: identified as including loss of biodiversity (including loss of habitat), weed infestation, and pest animals, loss of scenic amenity, water quality decline, changes to hydrological regime, significant impacts to groundwater resources, potential high bushfires hazard (especially to rural residents), questionable landscape management capabilities and capacity of new peri-urban settlers

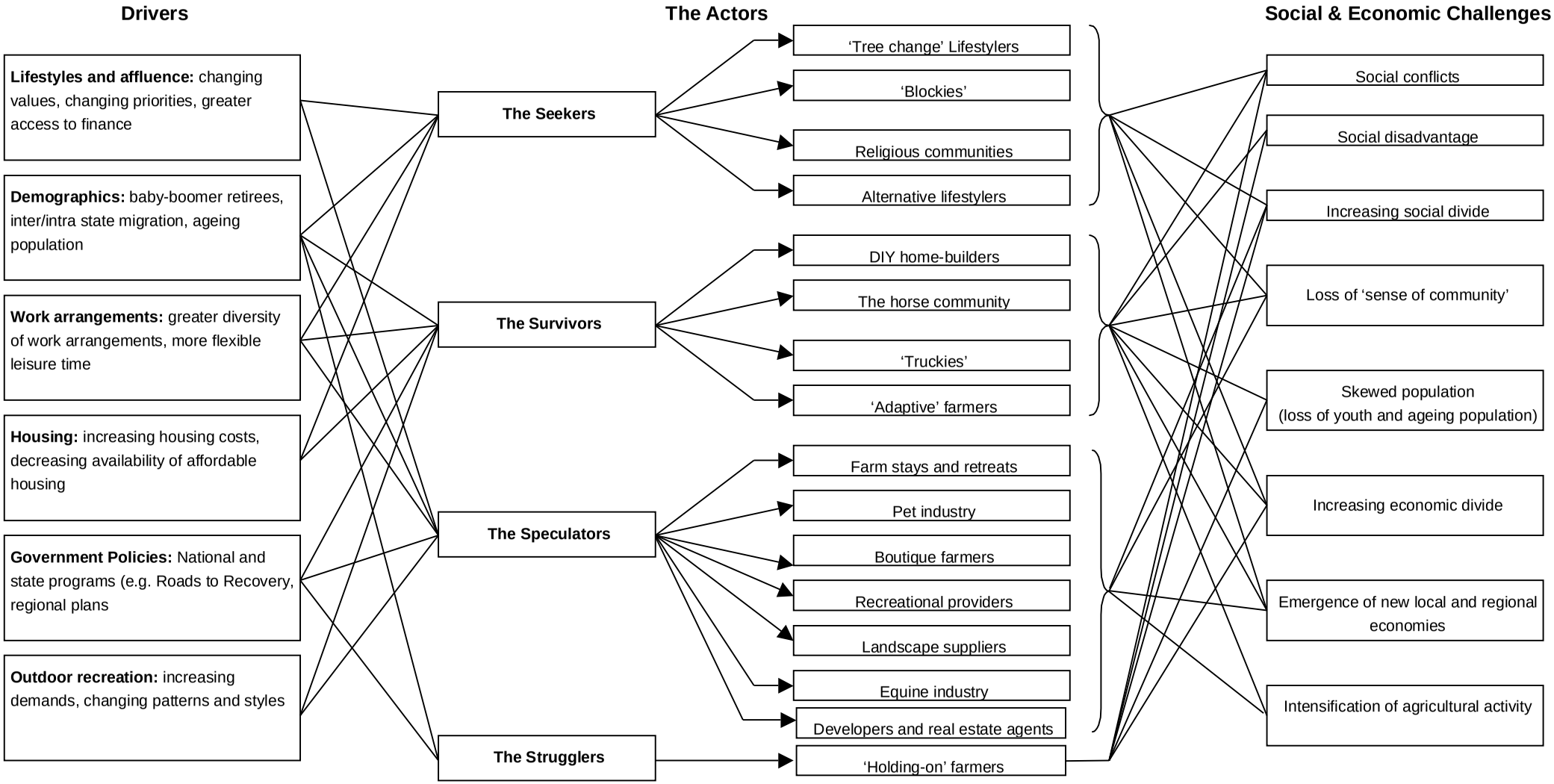
Social and economic challenges: these can involve skewed population (loss of young adults and ageing population), social conflicts (particularly between new peri-urban immigrants and long-term residents), social disadvantage, increasing social divide, increasing loss of a sense of community, increasing economic divide, emergence of new local and regional economies, and the intensification of agricultural activity (Low Choy et al. 2007).

The relationships between the drivers of peri-urban change, the new peri-urban landscape managers, along with the landscape management and socio-economic challenges are illustrated in Figures 2 and 3.



(after: Low Choy et al. 2007)

Figure 2: Drivers of change, new settlers and landscape management challenges in the peri-urban zone



(after: Low Choy et al. 2007)

Figure 3: Drivers of change, new settlers, and social and economic challenges in the peri-urban zone

1.4 Weeds in the Peri-Urban Landscape

Weed management in peri-urban areas is poorly understood and under-resourced. There is little information on the level of weed management that is undertaken by owners of smaller acreage properties. Resources for the ongoing control of invasive weeds and the monitoring of new and emerging weeds have traditionally been focused on large-scale commercial properties. Peri-urbanisation is increasing, particularly in areas in close proximity to urban and regional centres. Peri-urban landowners, especially rural lifestyle landowners, are recognised as having a significant impact on these landscapes and have been identified as having the potential to play a more significant role in the management of natural resources such as weeds.

The diversity found within the rural lifestyle landowner sector results in challenges in successful landowner engagement that are being grappled with at all levels of NRM. There are a number of common assumptions associated with weed management on peri-urban lands. These assumptions are:

1. The majority of rural lifestyle landowners undertake little weed management on their peri-urban properties.

2. Most rural lifestyle landowners have limited skills in identifying environmental weeds.

3. Most rural lifestyle landowners have little knowledge of appropriate weed management regimes.

4. Many rural lifestyle landowners have no knowledge of new and emerging weeds and as a result pose a potential biosecurity risk.

5. Few rural lifestyle landowners are motivated to undertake weed management on their land.

6. Most rural lifestyle landowners have financial resources to undertake weed management

7. Almost all rural lifestyle landowners have different motivations for controlling weeds, or reasons for not controlling weeds, from traditional farmers.

8. Providing more information to rural lifestyle landowners on weeds will result in a change in behaviour.

Successful engagement of rural lifestyle landowners requires an understanding of the current weed management undertaken by this sector and their priorities for weed management. It is also necessary to gain an understanding of the demographics, knowledge levels, motivation and resources of rural lifestyle landowners to help determine the barriers that exist

to behaviour change. It is generally acknowledged that information-intensive methods of engagement alone, such as publications and workshops, do not result in long-term behavioural change. It is therefore necessary to determine the barriers to behaviour change to enable the development of successful engagement programs.

The project proposed to address the following research questions to help inform future engagement of rural lifestyle landowners on weed management issues.

1.5 Key Research Questions

The conceptualisation of this project in a way that is consistent with the abovementioned rationale on peri-urban weed management, and which is supported by the literature, led to the scoping of the following research questions:

1. What drivers of change are influential in attracting the new wave of peri-urban dwellers (rural lifestyle landowners) to these locations and what are the characteristics of the lifestyles they are pursuing?

2. Are these drivers and trends likely to continue in the near future?

3. What are the priority weed management challenges for existing peri-urban areas?

4. Do rural lifestylers have the necessary motivation, capability and capacity to properly address existing and emergent NRM issues, particularly invasive weeds, on their properties?

5. Do rural lifestylers have well-developed networks that can be utilised to inform and disseminate important NRM information and messages on weeds through their peri-urban communities?

2. Study Methodology

To address the research questions within the context of the area of interest of the UMCCC, it was decided to utilise a case study approach. These case studies provided the spatial context for the conduct of detailed investigations of the resident population. These investigations were largely facilitated by the conduct of questionnaire surveys of a selected sample of rural lifestyle landholders from these case study areas. Phone surveys were also conducted with government weed officers responsible for the case study areas to provide information on the trends of weed issues and control regulation. These surveys were supplemented by the employment of focus groups to gather data on knowledge levels and to evaluate the effectiveness of proposed training methods before, during and after the surveys. The budget and project timings limited the study to two case study areas within the UMCCC area.

2.1 Study Area Selection—The Upper Murrumbidgee Catchment

Parts of the Upper Murrumbidgee Catchment have had a long history of peri-urbanisation since the first soldier settlement schemes were initiated after World War I. More recently, the landscape around Canberra and the Australian Capital Territory (ACT) has seen an increase in peri-urbanisation that started in the late 1970s and increased rapidly in the 1990s.

Within the area of the Upper Murrumbidgee Catchment, a case study selection process was undertaken to determine two suitable areas. Potential areas, in terms of their generic village or subdivision location and their relevant local government area that were considered in the first approximation of the selection process included:

Royalla	Palerang and Queanbeyan City
Carwoola	Palerang and Queanbeyan City
Murrumbateman	Yass Valley
Wamboin	Palerang
Gundaroo	Yass Valley
Yass	Yass Valley

The second approximation of the case study selection process rated these potential areas in terms of a set of essential and desirable attributes that the project was seeking to examine:

Essential attributes:

1. Case studies should be representative of a number of the emergent peri-urban typologies (theoretical underpinning – see Section 2).

2. They should contain a representative cross-representation of the 'actors' (theoretical underpinning – see Section 2).

3. Case studies should correlate with the priorities identified from the review of existing institutional landscape managers (see Section 4.3 below).

4. Case studies should be representative of the range of landscape management regimes across the UMCCC area of interest.

Desirable attributes:

1. Case studies should include a range of peri-urban developments that display a diversity of 'urban' related services (e.g. postal delivery, solid waste collection and road surfaces) – that is, ascertaining the degree of 'urbaness' or 'rurality' of the residents.

2. They should include a range of peri-urban attributes (e.g. block size, biophysical characteristics, past landscape management practices) that may require a different level of management commitment now.

3. Case studies should include the range of stakeholder that could potentially improve successful data collection and uptake of the outputs of the study.

4. Case studies should include the horse industry and horse community.

The results of the application of these selection criteria to the potential case study areas are set out in Table 1.

Table 1: Second approximation of case study area selection

Attributes / Potential Case Study Areas	Essential Attributes				Desirable Attributes			
	1. Representative typology	2. Cross-representation of 'actors'	3. Landscape managers' priorities	4. Representative landscape management regimes	1. Diversity of services	2. Range of peri-urban attributes	3. Range of stakeholder	4. Horse industry and horse community
Royalla (NSW)	3	1	3	1	1	1	3	3
Carwoola (NSW)	3	2	3	1	1	1	3	2
Murrumbateman (NSW)	3	3	3	3	3	3	3	3
Wamboin (NSW)	3	3	3	2	2	2	2	3
Gundaroo (NSW)	3	1	3	1	1	1	1	2
Tharwa (ACT)	1	1	3	1	1	1	2	1
Yass (NSW)	3	2	3	3	2	2	1	3

(Key: 1 = limited representation; 2 = represented; 3 = good representation)

The village of Murrumbateman in Yass Valley and the rural residential area of Wamboin in Palerang scored well above other potential areas and were subsequently selected as the most appropriate case study locations. These case study areas and their wider geographic context are shown in Figure 4.

The selected areas were confirmed (third approximation) through an aerial reconnaissance that utilised a light aircraft to fly over both areas and to obtain a set of aerial photographs. This reconnaissance provided an understanding of the infrastructure development and layout of the peri-urban areas and how they related to major roads, regional centres and the natural features of the region. This information was used to define each case study area in terms of the generic peri-urban typology (Low Choy et al. 2007). This aerial information was later confirmed through ground reconnaissance.

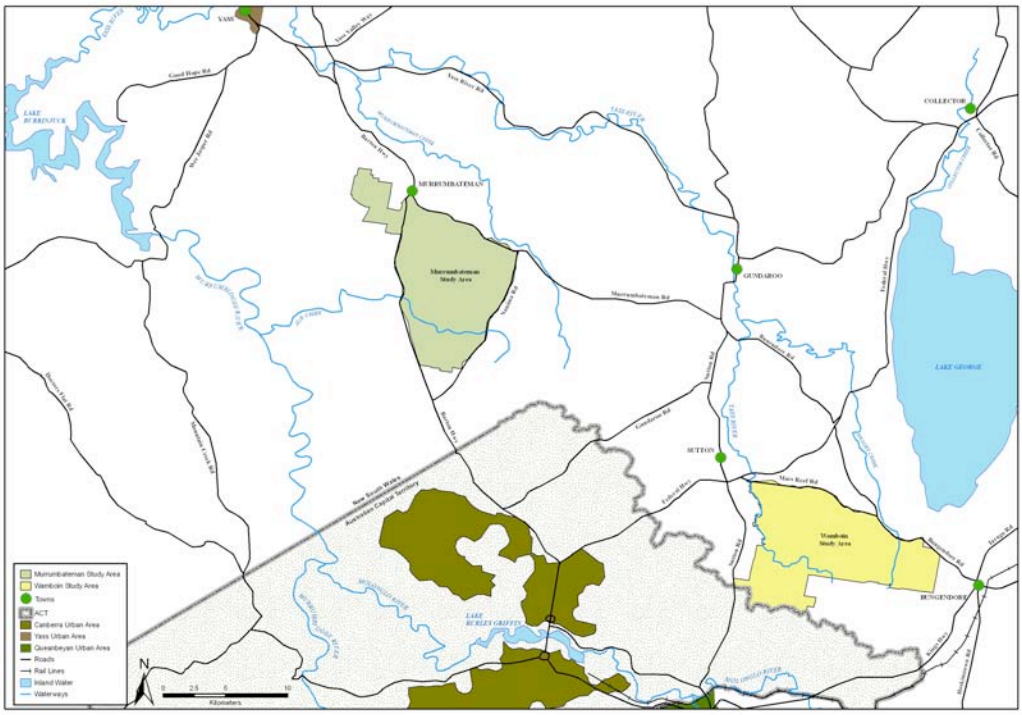


Figure 4: Case study areas

2.2 Study methods

The study used a multifaceted approach to data collection to provide a balanced and comprehensive understanding of the case study locations and the rural lifestyle landowners located within the study areas. This included a survey of rural lifestyle landowners in each case study area using questionnaires to collect quantitative data on the demographics of rural lifestyle landowners and the infrastructure and environmental weeds on their properties. The questionnaire also collected qualitative data on rural lifestyle landowners' lifestyles, values, attitudes and knowledge levels.

A focus group comprising representatives from rural lifestyle landowners, weed officers and local government officers was also used to gain an understanding of the weed management issues in these peri-urban areas. Recommendations from this focus group assisted with the development of the formal questionnaire that was distributed to rural lifestyle landowners in the case study areas.

The questionnaire data was later correlated with Australian Bureau of Statistics (ABS) census data for each case study area. Additional data were separately collected on the services available in each of the areas including: contract services, community networks, and services to properties.

2.2.1 Survey (Questionnaire) Development

Consistent with the study's research questions, consideration was given to a range of questions and issues relevant to rural lifestyle landowners in the development of a questionnaire-style survey to explore the agents of change to peri-urban weed management. This included the tasks to determine:

1. Who are the rural lifestyle landowners and their motivation for choosing a peri-urban lifestyle in the case study areas of the Upper Murrumbidgee Catchment? (Who are they, where did they come from, what is their background and why are they there?)

2. The attitudes and motivators of rural lifestyle landowners in relation to land and weed management. (What are their priorities, attitudes towards land and weed management? Why do, or don't, they undertake land and weed management? Do they see themselves as part of the solution?)

3. The degree to which cultural, social and economic drivers influence land and weed management choices made by rural lifestyle landowners. (What is their cultural, social and economic situation and how might this affect the way they manage their property?)

4. The level of knowledge and understanding that rural lifestyle landowners have of land and weed management issues, practices, techniques and publicly available resources. (What do they know about the problems and solutions? Do they know what to do and how to do it? Do they know how to get practical or financial help?)

5. How knowledge and resources are best disseminated to rural lifestyle landowners to achieve sustainable outcomes at a landscape level. (Where do *they* see their knowledge and resource gaps? If they have knowledge, how did they come by it? Do they think they were prepared when they bought the property? What do they think would be the best way to engage them and their neighbours in land and weed management?)

The specific objectives of the case-study questionnaire, along with a series of follow-up points for the survey, are contained in Appendix 1.

2.2.2 Questionnaire – Conduct

The questionnaires were piloted prior to the commencement of the survey using volunteer rural lifestyle landowners. Feedback from the volunteers enabled some questions to be refined and the amount of time required to undertake the survey to be estimated.

In December 2007 final questionnaires were distributed within a data collection area of each case study location. The data collection areas were chosen to correlate directly with the ABS Collection Districts for the 2006 Census for Murrumbateman and Wamboin state suburb, New South Wales. This enabled data from the questionnaires to be directly correlated with the ABS data.

The survey was advertised prior to its commencement in the *Wamboin Whisper* and the *Bungendore Mirror* (local newspapers delivered in Wamboin), the Yass Valley Council newsletter (for Murrumbateman) and on the Molonglo Catchment Group website. Notices were also placed in the Bungendore and Murrumbateman rural supply stores.

The survey was originally planned to be conducted in December 2007 and January 2008 by five local volunteers, who randomly visited individual properties and invited people to complete the questionnaire – a 'door knock' approach. The random survey was conducted during weekdays in the late afternoons and evenings as well as during weekends.

It was expected that the questionnaire would take 20 to 30 minutes to complete, and it was anticipated that the interviewer would stay while the interviewee completed the questionnaire. Although 99% of people approached agreed to complete the questionnaire, most were unwilling to complete the questionnaires while the volunteer waited. In these cases, the questionnaires were left for the interviewees to complete in their own time and they were requested to leave the completed questionnaire in their mailbox for collection at a later date. However, the number of questionnaires returned was low.

Possible reasons for this poor response rate could be the length of questionnaire or an inability for interviewees to see a personal benefit in answering the questionnaire. It is also possible that the time of year, being over the Christmas period, resulted in many people being away on holidays or busier than usual. The survey results indicated that people in the case study areas were 'time poor', further supporting the theory that many may have believed they had insufficient free time to fill in a lengthy questionnaire. Another barrier to the door knock method in some areas of Murrumbateman was the presence of locked gates, restricting access to properties, and unleashed dogs, making it unsafe for volunteers to enter properties. As an example, an examination of 46 properties along one randomly selected street, showed that 48% were safe to enter, while 43% had locked gates or loose dogs, and the remaining 9% were for sale and vacant.

In an attempt to increase the February 2008 response rate, people who had not returned their questionnaire were offered an incentive in the form of a free copy of *Bringing Back Birds* (a bird identification book) and a booklet titled

Surviving Drought (specifically developed for small landholders). The survey data collection period was subsequently extended until mid-March 2008.

In a further attempt to increase the survey's response rate, an electronic questionnaire was made available on the Molonglo Catchment Group website in February 2008 with an email address for return. The electronic option was advertised in various community newsletters including those produced by the ACT Government, Landcare groups and rural residential associations. Notices were also posted on rural supply store notice boards.

A letterbox drop was also undertaken in Murrumbateman in March 2008 (the area with the lowest return rate from the original method), asking people to complete the questionnaire and leave it in their mail boxes for collection or complete the survey online through the website. The free publications were also offered as an incentive. Respondents were given seven days to complete the questionnaire; after this a reminder was issued with a second collection date.

All respondents that sent their questionnaire electronically were asked to include their address to ensure their properties were located in the study area.

The various methods of surveying residents in the case study areas resulted in varying response rates as indicated in Table 2.

The 115 responses from acreage properties in the study represent 13 per cent of all properties in both case study areas (acreage and town/village blocks).

The responses to the varying survey methods indicated that the most efficient method of surveying a population for peri-urban locations in the case study areas was by a letterbox drop with an incentive offered. Providing the questionnaire electronically was also effective as it required very few resources. It is likely that, if the electronic option had been available for a longer period, the response rate would have been even higher. It is also possible that a questionnaire that could be completed online (rather than filled in electronically and emailed) would have resulted in an even higher response rate.

The relatively high response rate for the electronic option may indicate the convenience of this approach for 'time-poor' respondents. A high percentage of respondents worked full time in Canberra and spent approximately one and a half hours a day commuting. It is possible that some may have completed the electronic questionnaire in their work time. This method appears to have made the questionnaire more accessible and convenient for people to complete and return.

Table 2: Survey response rates by varying methods of implementation

Method	Resources	Number Distributed	Number of Responses			Response Rate
			Murrumbateman	Wamboin	Total	
Door knocking	5 volunteers over an 18 week period	200	18	40	58	35.0%
Door knocking with incentive	5 volunteers over a 6 week period		4	8	12	
Letterbox drop with incentive	2 volunteers over a 2 week period	60	19	n/a	19	31.7%
Sub-total		260	41	48	89	34.2%
Electronic questionnaire	Available over an 8 week period	n/a	10	16	26	n/a
Overall Total			51	64	115	
Number of households in each case study area			*402*	*480*	*882*	
% case study surveyed			12.7%	13.3%	13%	

4.3.4 Survey of Weed Officers

The government weed officers of Yass Valley (Murrumbateman study area) and Palerang (Wamboin study area) were interviewed by telephone in February and March 2009. The interview was conducted to provide supplementary information about selected species of weeds, the most challenging weed control issues, and any new and emerging weed issues in the case study areas. This information was then correlated with the information provided by respondents to determine trends and disparities in responses.

2.2.3 Survey of Rural Services

Contract services: Data were collected on the contract services available in each case study area, such as weed contactors and water carters that were directly related to the management of rural properties. The data were cross-correlated with questionnaire responses related to

rural lifestyle landowners' use of contractors for property maintenance. The purpose of this cross-correlation was to test the assumption that rural lifestyle landowners are resource rich but time poor, and therefore may be more likely to engage contractors to undertake work on their properties than traditional farmers. Data sources included local newspapers, community newsletters, community noticeboards, and notices in rural produce stores.

Community networks: Data were collected on community networks in each case study area to address the research question 'Do rural lifestylers have well developed networks that can be utilised to inform and disseminate important NRM information and messages on weeds through their peri-urban communities?' These data were cross-correlated with questionnaire responses related to residents' community networks, recreational pursuits and way of obtaining information on NRM. Community networks were identified using the Internet, community newsletters, community noticeboards, and personal communications.

Services to properties: Data were collected on the services provided to properties within the case study areas to gain an understanding of the lifestyle of rural lifestyle landowners. These data were supported by data from the questionnaire that related to the services available for individual properties, property infrastructure and the choices that were available in regard to the services they received, such as waste disposal.

Use of this data sought to establish a correlation between the level of infrastructure and services rural lifestyle landowners had to their properties and whether these landowners perceived themselves as more 'urban' or 'rural'. A sub-theory to this study was that rural lifestyle landowners who perceive themselves as an urban person living in a rural setting will hold urban values of land management. In contrast, rural lifestyle landowners who perceive themselves as rural persons living on rural properties will hold more rural values of land management. These values could then be linked to the level of weed management on peri-urban properties.

2.3 Project Reference Group

The project was supported by a project reference group, which drew together expertise on the topics of this research project from across the UMCCC area. The membership of the project reference group is set out in Appendix 2.

3. The Case Study Areas and the People

This section establishes the background and defining attributes of the rural lifestyle landowners, who form a major component of the contemporary peri-urban landscape managers within the Upper Murrumbidgee Catchment. It also examines the nature of their peri-urban properties.

3.1 Background and Attributes

3.1.1 Demographics of Respondents

The majority of the respondents (66%) were in the upper young to middle adult age group (24–54 years), 27% were in the 55–64 year age group, and a further 8% were aged 65 years or older. On a proportionate basis, this age distribution of respondents correlates with the areas' demographic characteristics from the 2006 ABS census.

An extremely high proportion of respondents (81%) had a tertiary qualification (Diploma 17%; Bachelors degree 34%; Post-graduate degree 30%) – see Figure 5. This is consistent with the general educational qualifications displayed by the populations for the 2006 census.

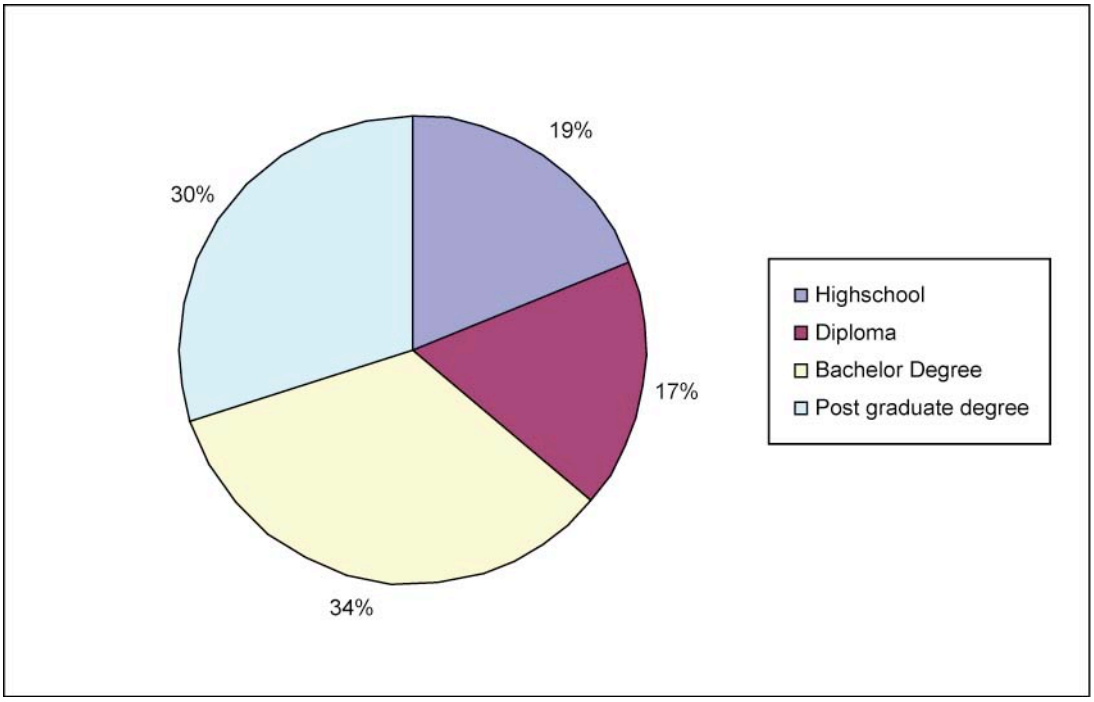


Figure 5: Respondents' highest level of education

In terms of their current primary employment status, the majority of respondents (68%) were in full-time employment, and fewer were in part-time or casual employment (8% and 1% respectively). A large number of

respondents (19%) were retired, and 3% were unemployed. The main occupational category of the respondents was public service (30%).

Respondents appeared to have a reasonable range of available leisure time (e.g. 60% had more than 20 hours available in the week preceding the survey). Ten per cent had the whole week available, being either retired or on leave from the military. The distribution of available weekly leisure time amongst the respondents was:

<10 hrs	19%
10–19 hrs	11%
20–29 hrs	19%
30–39 hrs	15%
40–49 hrs	7%
>50 hrs	9%
Retired/leave	10%
(no response	10%)

Respondents' principal leisure activity was overwhelming gardening (nominated by 43% of all respondents). Only 14% considered working on their property as a principal leisure activity. Surprisingly, given the large number of dogs on properties in the case study areas, only 5% nominated a principal leisure activity that involved dogs. Similarly, only 10% saw horse-related activities as a principal leisure activity. Participation in Landcare was nominated by only one respondent as a leisure activity.

Landcare was the most commonly nominated local and regional network that respondents were active members of. Not surprisingly, given the nature of land use activities involving animals across the landscape, a number of respondents were active members of organisations such as:

- ACT Dressage Association
- National Capital Equestrian Club
- Adult Riding Club (MARC)
- Bungendore Riding Club
- Murrumbateman Pony Club
- (unnamed) local pony club

- (unnamed) local dog club
- Companion dog club
- Australian Alpaca Association
- Beekeepers Association.

Many respondents also noted their membership to a range of local sports clubs, a number being associated with their children's pastimes.

The two-person household was the predominant household size (45% of all properties). This was followed by the four-person household (27%); three-person household (12%); five-person household (8%); and households with more than five persons (4%). The largest household comprised 10 persons. Six per cent of properties were single person households. Some 46% of all households included dependent children.

There was a very high degree of 'home ownership' amongst the respondents: 99% owned their property, a figure that is consistent with the demographic trends from the 2006 ABS census (see Sections 3.2.3 and 3.3.3). Similarly, 99% lived permanently on their property.

The 'length of stay' responses suggest that the case study areas are characterised by stable communities with relatively low degrees of residential mobility – a situation that is consistent with the ABS 2006 census information (see Sections 3.2.2 and 3.3.2). The analysis of the 'length of stay' responses demonstrated:

< 1year	13% (of all responses)
1–4 years	31%
5–9 years	13%
>10 years	41%
Absentee owners	1%

The shortest residency was one month; the longest was 30 years (two respondents). Eleven per cent of respondents had lived in their respective properties for 20 years or longer.

Three quarters (76.5%) of the respondents had moved to the case study areas directly from Canberra. Only 18.5% had moved directly from a rural area (15% from regional and rural NSW, and 3.5% from rural interstate locations). Some 4% had originated from an interstate urban location, and the remaining 1% had previously lived overseas. Some 47% of respondents

stated that they had lived on a rural property at some time in their lives. The respondents' previous residential locations prior to occupying their current property is illustrated in Figure 6.

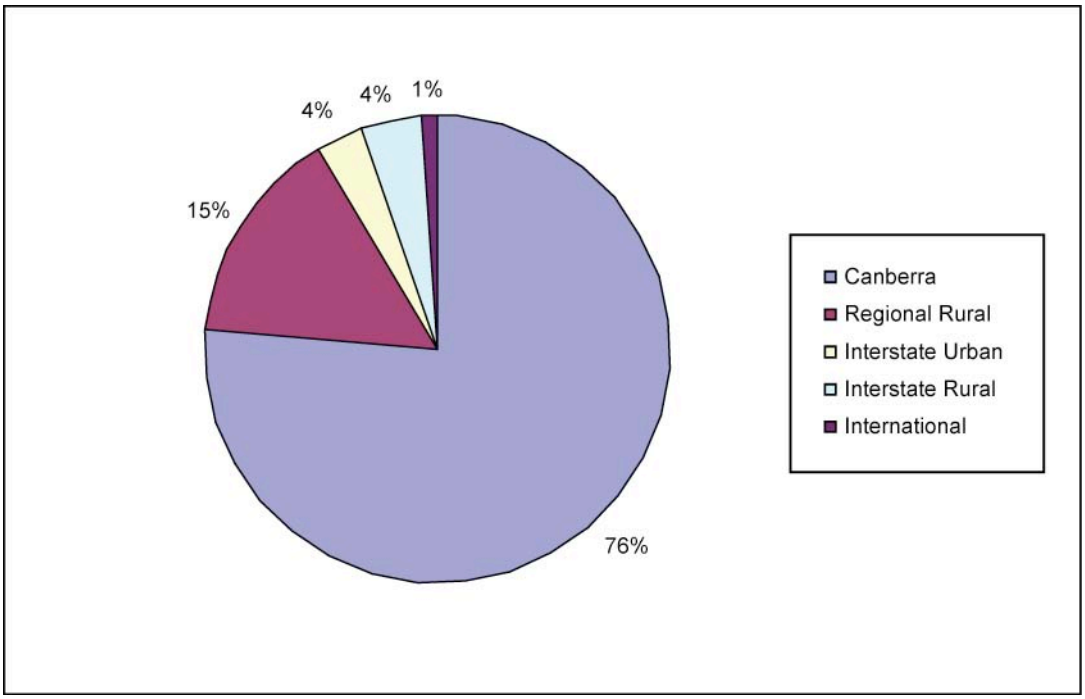


Figure 6: Previous residential location

These demographic characteristics of the survey's respondents are consistent with the demographic profile of the case study areas that was reported in the 2006 ABS Census.

3.1.2 Commuting Behaviour

Typical of peri-urban residential locations in the commuting zones to major urban and metropolitan areas, the case study areas have a very high rate of car ownership. Some 51% of all dwellings had two motor vehicles; a further 21% had three motor vehicles, whilst 12% had four or more motor vehicles (ABS 2006 census). Surprisingly, seven dwellings in Murrumbateman were without a motor vehicle.

Predictably, three quarters of all trips were for employment purposes, highlighting a typical attribute of peri-urban commuting areas. The next major primary reason for commuting was for the purposes of shopping. The full range of principal reasons cited by respondents for commuting are in Table 3.

Table 3: Principal reasons for commuting

Purpose for Commuting	*% of all Trips*
Employment	75%
Shopping	13%
Adult recreation	6%
Children's recreation	3%
Health	1%
Social	1%
Education	1%
Total	100%

The principal destination for commuting was Canberra (58% of all trips). The remaining trips were to the other centres in the region: Queanbeyan (15%); Yass (14%); and Bungendore (10%). The principal destinations for all commuting trips are graphically presented in Figure 7.

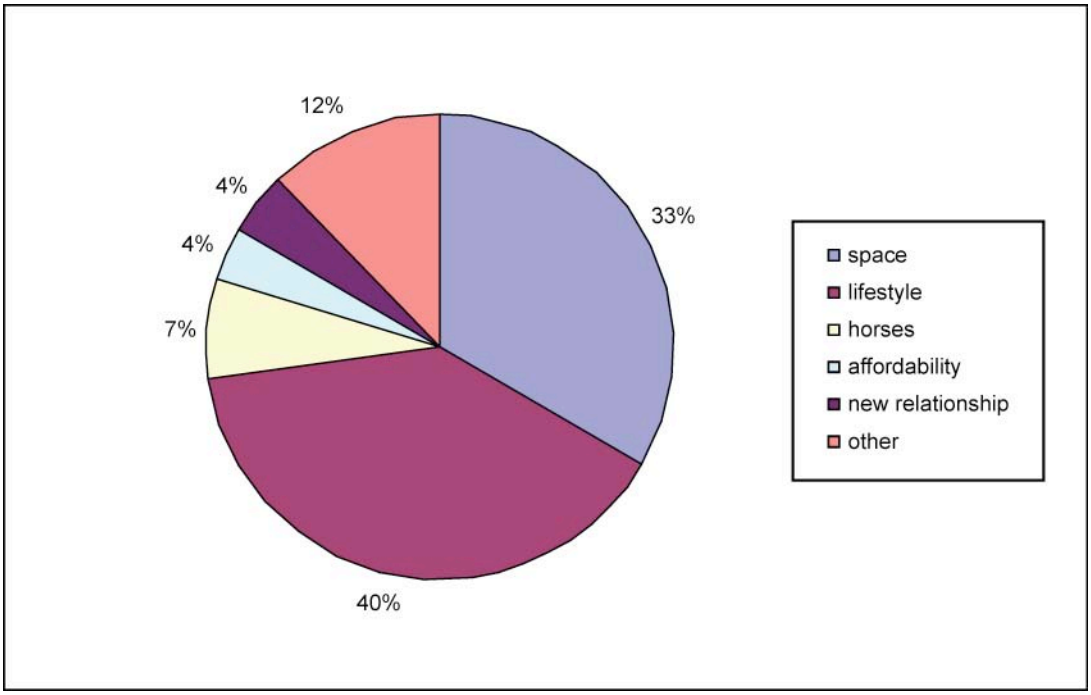


Figure 7: Principle destinations for commuting trips

In the week preceding the survey, the majority of respondents (60%) undertook 5–9 trips. Twenty-two per cent completed1–4 trips and 10% made

10 or more trips, with the most trips being recorded as 15 for the week. The time spent commuting that week included:

<2 hrs	8% (of all respondents)
2–4 hrs	30%
5–7 hrs	30%
8–10 hrs	18%
11-13hrs	4%
14 hrs +	6% (including two respondents who each commuted for 20 hours that week).

3.1.3 Use of Properties

The principal reasons cited by respondents for relocating to their current property in the case study areas were: “rural lifestyle” (40%) and “space” (33%). Others did so for “horses” (7%); “new relationship” (4%) and “affordability” (4%). The remaining reasons (12%) comprised “acreage in proximity to Canberra”; “room to grow native plants”; “large garden”; “rehab the bush”; “house size”; “quite”; “views”; and “no close neighbours”. A comparison of the various reasons for relocating to their current property can be gauged from Figure 8.

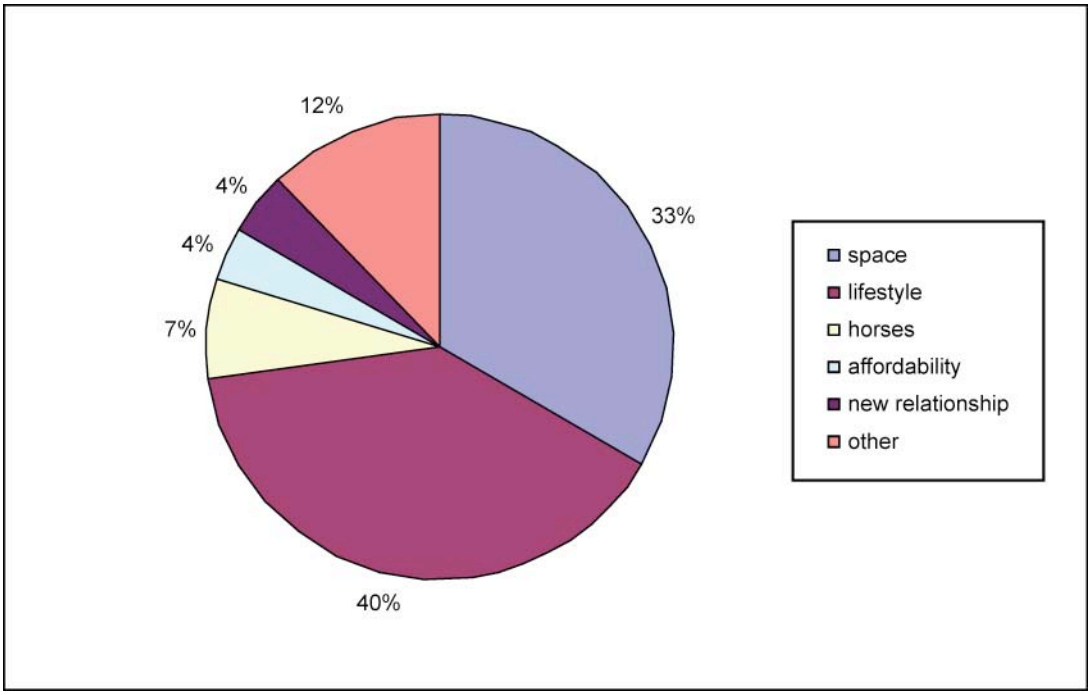


Figure 8: Principle reasons for relocation

The primary uses that respondents cited for the use of their property included:

Residence	66%
Self-sufficiency	11%
Horses	11%
Other stock	5%
Biodiversity	4%
Business	3%

Hobby farms were commonly mentioned, and a few respondents cited ‘recreation’ as the primary use. The ‘Other stock’ category included alpacas, sheep and cattle. Self-sufficiency purposes included the keeping of poultry and beehives. Fruit and vegetable gardens were also regularly cited as other uses of their properties. Biodiversity purposes included growing native plants, permaculture, nature conservation, providing habitats for native birds and rehabilitating the bush. Figure 9 illustrates the primary-use categories that were listed by respondents.

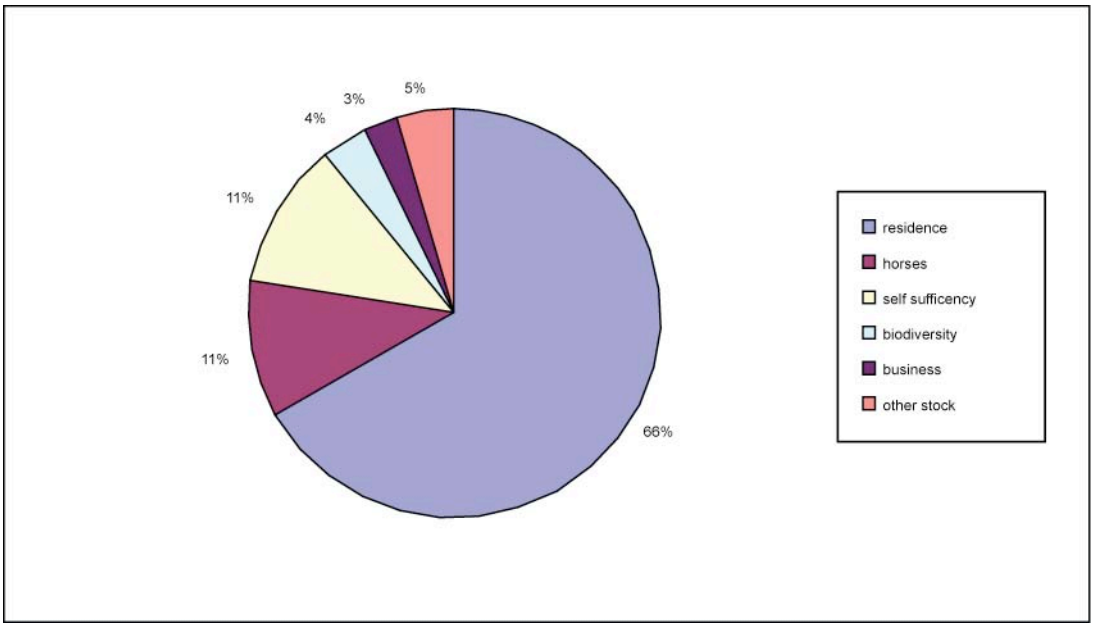


Figure 9: Primary use of property

The survey sought to establish the range and type of animals that the acreage properties supported. Twenty-one per cent of the surveyed properties did not have any animals.

The remaining properties supported a wide range of animals, including:

> *Horses*: 25% of properties supported horses, with 80% of respondents having more than one horse. The most common numbers of horses per property were 2 (eight properties) and 3 (eight properties). The most common stocking rates were 1 horse per 5 acres (six properties) and 1 horse per 10 acres (six properties). Eight properties, however, had low stocking rates of 1 horse to 2 acres or less. The horses on two of the properties (each of three animals) were on agistment.
>
> *Sheep*: Seven properties supported sheep, including one commercial property that had a flock of 2000 sheep. Three properties had only one sheep and another had sheep on agistment (two animals).
>
> *Cattle*: Only three properties reported having cattle. The previously mentioned commercial sheep property also had a herd of 70 cattle. In fact, all cattle herds were on larger properties (e.g. 14 cattle on 150 acres and three cattle on 36 acres).
>
> *Alpacas*: Four properties had alpacas – the largest number was 14 animals. The common stocking rate for alpacas from the survey appears to be between 1 animal per 1.5–2.5 acres. A fifth property had 3 llamas on 5 acres.
>
> *Poultry*: Twenty-seven of the respondents kept poultry, mainly chickens. Seven had 10 or more fowls. A small number had ducks and geese.
>
> *Other*: Individual properties also had a number of other animals including donkeys, bees, and goats.

Domestic animals overwhelmingly dominated the responses for animals on the properties in the case study areas. Fifty-seven per cent of properties had dogs, and a half of these had two or more. Some 22% of properties had cats. Other household pet animals noted included rabbits, guinea pigs and birds.

Clearly, self-sufficiency was a strong motivator behind the range and sometimes numbers, of animals being kept on these properties (beyond the 11% of respondents that cited this as their primary use of their property). The examination of the primary purpose that respondents claimed for having stock on their properties (see Figure 10) produced an interesting insight into the lifestyles of these peri-urban residents. Reasons included keeping animals as pets (28%); for recreational purposes (28%); as lawnmowers (26%); and for commercial purposes (18%).

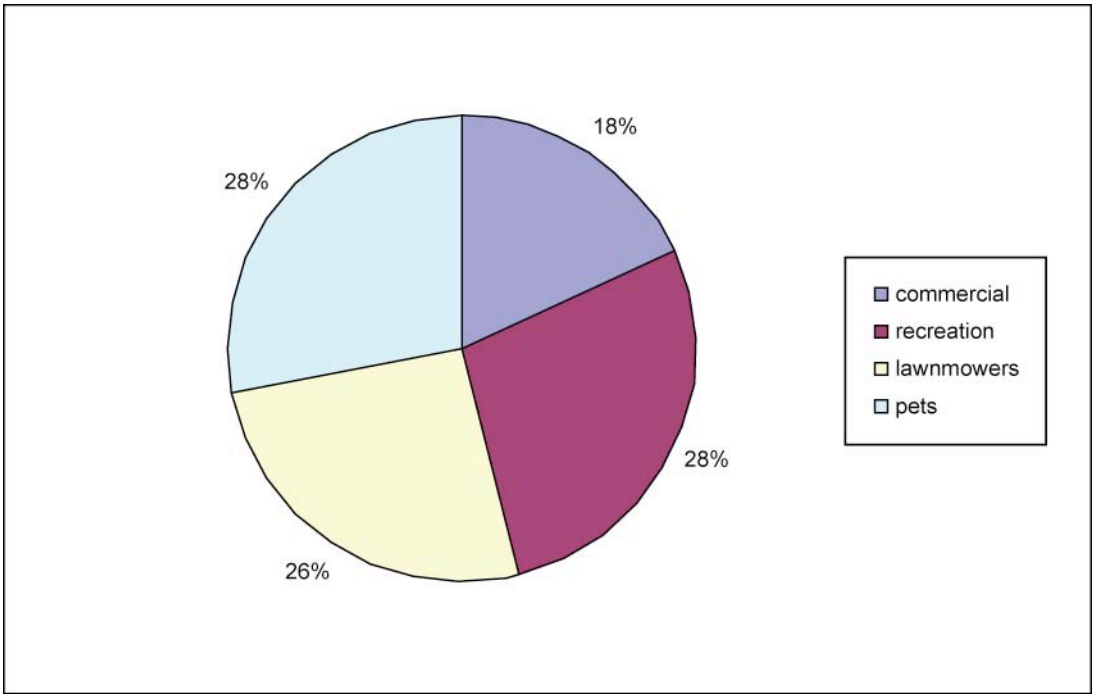


Figure 10: Primary purpose for livestock

The non-agricultural economic purpose of these peri-urban properties is best highlighted by the respondent's total household income that was derived from their properties (for the 2006–07 financial year) – see Figure 11.
The proportions included:

0% derived from property	89% of respondents
0 to 25%	6%
25 to 50%	3%

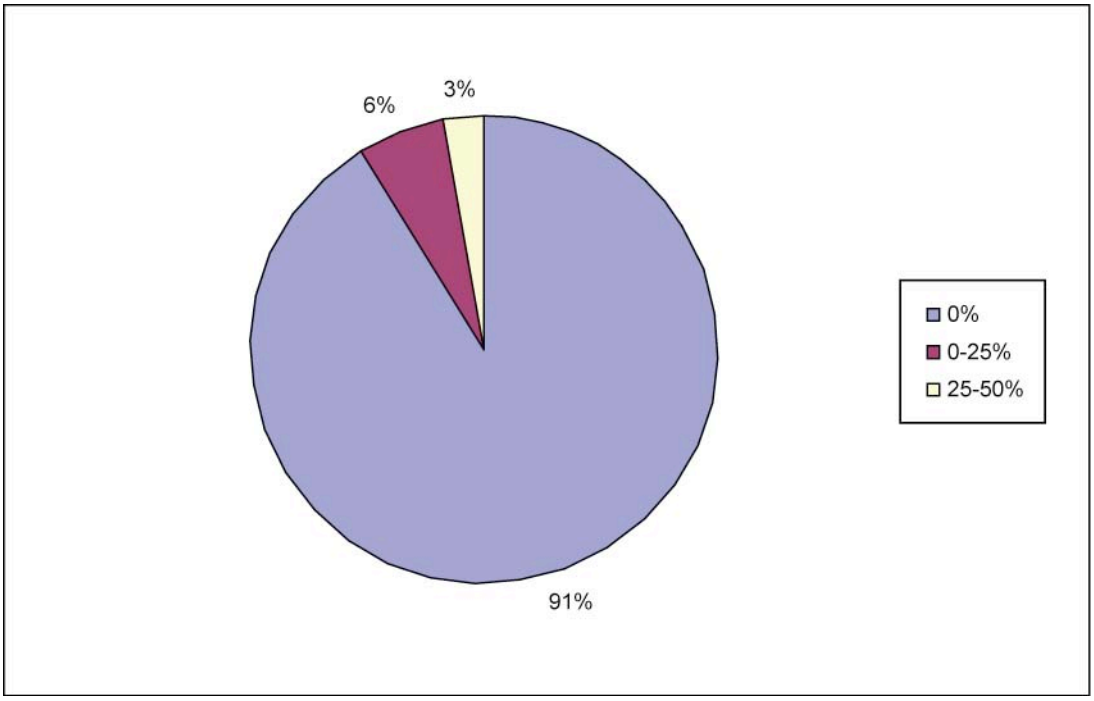


Figure 11: Total household income generated from property (2006–07)

3.1.4 Stock Management

Stock movement was largely by respondents' own truck or float (44% of all properties with horses). A further 28% of properties moved their stock by hired floats, and 24% used contractors. Two properties stated that they did not move their stock.

The main imported stockfeed was hay (used by 18% of all properties and 72% of all properties with horses). Other imported animal feed included: grains (10% of all properties); lucerne (7%); chaff (7%); and straw (3%). Eleven per cent of all properties (44% of properties with horses) did not import stockfeed, including the two properties used for agistment.

The main source for stockfeed was the produce store (39% of all properties). Other sources included: "purchase from farmers" (10%), "cutting own hay" (1%), and imported through agents (3%). The geographic sources for the latter were: Canowindra, Young and Deniliquin.

3.1.5 Property Characteristics

Although there was a wide variation in the property size of respondents, the majority (51%) were small lots (less than 10 acres [4 hectares]). The largest group was the 5–9 acres lots (32%). The survey sample included three properties at the other end of the size scale (of 120 acres, 150 acres, and 212 acres). The distribution of the lot sizes from the survey sample is in Table 4.

Table 4: Lot size distribution

Lot Size Category (acres)	*% of Total Lots*
1 to 4	19
5 to 9	32
10 to 14	13
15 to 19	5
20 to 24	11
25 to 29	4
30 to 34	3
35 to 39	2
40 to 44	4
45 to 49	3
50 to 54	1
>100	3

Almost all properties surveyed had a dwelling. Those few properties without a dwelling had an absentee owner who stated an intention to build in the near future. A number of properties were well developed in terms of private recreational facilities such as swimming pools (13%), and one property supported a tennis court. Other built infrastructure on many properties was heavily oriented towards equine activities. For example, 15 properties (13%) had one or more stockyards; twelve properties (10%) had stables, and seven properties had two or more stables; and a further three properties contained a dressage arena.

There was a high incidence of farm dams across the case study areas (partly because it was a requirement in some areas): 79% of all properties had at least one dam. Of those surveyed, 21% of properties had no dam, 44% of properties had one dam, 18% had two dams, and 6% had three dams. A further 9% of properties had access to their estate's community dams. The two commercial properties in the study had 5 and 25 dams.

The survey also sought to establish the capacity of farm dam storage. Most respondents were unable to provide this information. The data from those that did (14% of respondents) indicated that there were large amounts of water held in this form of storage. For example, one property had 10 megalitres of

water stored in its dams, another 2.6 megalitres and five properties each had 1 megalitre. The primary use for the water stored in farm dams was:

Fire protection	42% (of properties)
Stock watering	19%
Aesthetics	3%
Gardens/vegetables	3%
Other (not specified)	3%
Wildlife habitat	1%
Construction	1%
(not specified	28%)

Thirty-six per cent of properties surveyed also had access to water through a bore; and one property had 2 bores. None of the properties in the case study areas had access to reticulated supplies of town water; however, only 83% reported having tank water.

Reported tank water supply capacities included:

<20 kilolitres	4% (of all properties surveyed)
20 to 50 kilolitres	25%
50 to 100 kilolitres	21%
100 to 150 kilolitres	25%
>150 kilolitres	8%
(None reported	18%)

The majority of properties surveyed (87%) had a gravel access road and a smaller but significant number (10%) had bitumen driveways. Whilst the most gravel access roads (19% of all roads) were between 100 to 200 metres in length, the longest access roads were also of gravel construction (two of 1 kilometre length, one road of 2 kilometres; and one of 4 kilometres). In comparison, three of the longest bitumen access roads were in the vicinity of 500 metres.

The ‘rural’ nature of these areas meant that properties lacked the normal range of urban services such as town water and sewerage. However, contrary to this notion of a ‘rural’ living environment, most properties were serviced by

mains electricity and a daily postal delivery service. Respondent indicated the following levels of services to their properties:

Mains power	84% (of respondents with access)
Mail delivery to gate	72%
Cluster box at main road	15%
Alternative power	5%
Piped sewer	0%
Town water	0%

In terms of solid waste disposal, three quarters of the respondents did not have a council service and undertook that task themselves (65%) or used a private contractor (10%), or both.

Respondents used the following methods of disposal:

Take to tip	65% (respondents do so)
Council collection	37%
Private collection	10%
Disposal onsite	9%
Other	5%

Totals add to more than 100% because some respondents used more than one method.

The ‘other’ methods were dominated by composting, some very minor recycling, and one response stated ‘burning’.

Respondents reported the following communication systems available on their properties:

Phone (landline)	97%
Mobile phone coverage	73%
Internet	77%
Broadband	58%

3.1.6 Future Plans

In terms of their future intentions with respect to their property, two thirds of respondents (66%) saw themselves staying indefinitely, whilst a further 6% said they would pass it on to their children. Some 3% thought that they would stay for less than 5 years, 17% 5–10 years, and the remaining 8% were uncertain.

Respondent's future plans for their properties included:

> *Habitat restoration*: this was the most commonly mentioned aspiration and included a range of related future plans such as: "restoration of original state"; "wetland construction"; "wildlife sanctuary"; "landscaping"; "tree planting"; "erosion control" and "sustainability" intentions. This group of future plans was indicated by 30% of respondents.
>
> *Self sufficiency*: this was also a popular intention, with 13% of respondents mentioning future plans such as: establishing vegetable gardens; permaculture initiatives; and horticultural greenhouses.
>
> *Property development*: 14% of respondents cited property development plans, which included a range of initiatives such as: pasture improvements; infrastructure development (specifically a dressage area and swimming pool); establishing gardens; and a host of building construction (house extensions, granny flat, sheds, studios, rental house, greenhouses, and American barn).
>
> *Additional stock*: 7% of respondents noted that they would like to add additional stock such as: horses; ponies; sheep; goats and llamas.
>
> *Commercial activities*: a minor number of respondents also signified that they had plans for a number of commercial operations such as: orchids; olive groves; and mixed berry farming.

Interestingly, only three respondents mention future plans involving weed control on their properties.

3.2 Case Study Area – Murrumbateman

3.2.1 Location

Murrumbateman is a rural village located 36 kilometres from the Canberra central business district and 18.2 kilometres from Yass, the closest large commercial centre. The village is 30 minutes north of Canberra and three hours south of Sydney (see Figure 12). The Murrumbateman area correlates with the peri-urban PU2 typology (see Section 1.1). An historical overview of the Murrumbateman area is provided in Appendix 3.

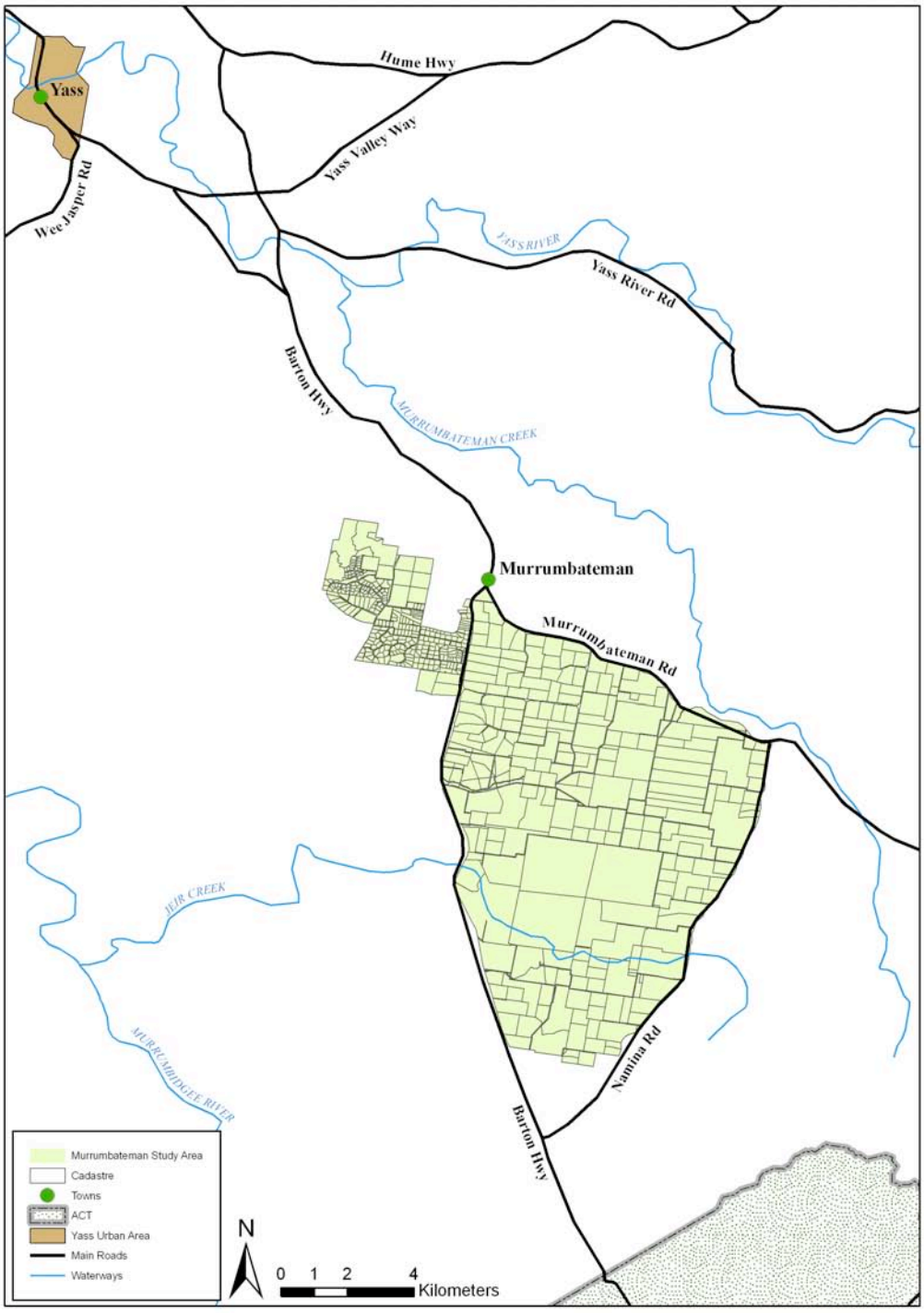


Figure 12: Murrumbateman study area

3.2.2 Demographics

The Murrumbateman area has an equally balanced male-female distribution to its population of 2144 persons. The community's principal demographics characteristics are summarised in Appendix 4 (ABS, 2006 census).

The largest age cohorts are the middle age groups from the 35–39 years cohort through to the 55–59 years cohort. Collectively these five cohorts constitute 43.2% of the Murrumbateman's total population. There are also corresponding large cohorts in the youth groups from the 0–4 years cohort through to the 15–19 years cohort. This latter group comprises 32.5% of the total population. With three quarters of the case study area's population distributed in these age cohorts, there is a clear picture of the mature family group dominating the Murrumbateman area. This conclusion is supported by the average household size of three, and a median age of 37 years.

The majority of the population (80%) were born in Australia, with only 0.5% of Indigenous background. The results also demonstrate a high degree of stability (in terms of residential mobility): 80% have resided at the same residential address one year prior to the census (2006), and 45% five years prior.

The population displays a high degree of education qualification (e.g. 26% hold a tertiary qualification and 40% have a qualification beyond school level). Not surprisingly, there are relatively high proportions of the workforce in the managerial and professional categories. The principal occupations of the Murrumbateman population include:

Managers	19%
Professionals	24%
Technicians and trades workers	13%
Community and personal service workers	8%
Clerical and administrative workers	19%
Sales workers	7%
Machinery operators and drivers	2%
Labourers	5%
Not stated	1%

There is a high degree of labour force participation (75.5%) and a correspondingly low rate of unemployment (1.9%). The four dominant

industries of employment for the Murrumbateman study area's population include:

Public administration and safety	23%
Professional, scientific and technical services	10%
Construction	10%
Education and training	9%

As indicated by the population's education qualifications, occupations and industry of employment, the area's residents enjoy a high degree of personal and household income. Some 37% of the workforce was in receipt of a gross individual weekly income of $1000 or more. Eighty-one per cent of households had weekly incomes that exceeded $1000, whilst 46% were in excess of $2000 per week, and 18% exceeded $3000 per week.

3.2.3 Dwellings

The main form of dwelling in the Murrumbateman study area is the detached house (98% of dwellings), and there is a very high degree of home-ownership (31% owned and 61% being purchased). There are very few rental properties in Murrumbateman (8%).

3.2.4 Amenities and Services

Murrumbateman has its own church, a pre-school, community hall, recreation ground, volunteer bush fire brigade, pony club, and cub and scout groups. Each year the Murrumbateman Progress Association holds the Murrumbateman Field Day, which is well attended by people from around the region including Canberra. The Murrumbateman village contains a pub with motel, a general store, service station, post office, butcher, take-away, hairdresser and rural supplies store. There are also several cool climate wineries in the district. Although the village contains the basic services, it is highly likely, given the nature of Murrumbateman (peri-urban) community, that the majority of residents would be employed in Canberra and utilise the services provided by that centre. Canberra provides all facilities found in a city centre, including financial, community, employment and entertainment functions.

Yass on the other hand, serves as an alternative service centre to Canberra for those residents who are in a position to visit it and who are not tied to Canberra for employment purposes. Yass provides all retail and banking facilities to be found in a large commercial centre, but little in the way of entertainment amenities.

Further details on services available to the area are contained in the Infrastructure Report for Murrumbateman (Yass Valley Council) and Wamboin (Palerang Council) – see Appendix 5.

3.2.5 Transport Network

The Barton Highway serves as the main transport link to Murrumbateman from both Yass and Canberra. The NSW Roads and Transport Authority is currently planning a new highway bypass around the Murrumbateman village.

Public transport is provided by a bus service, which runs regularly between Yass and Canberra. This service caters for Canberra-based workers with a timetable that peaks mornings and evenings, but with an irregular service at other times of the day and weekends.

3.2.6 Social Network

The Murrumbateman area is served by a diverse range and number of social networks which include: Murrumbateman Progress Association, Adult Riding Club, Agricultural Bureau, Anglican Church, Book Club, Bush Fire Brigade, Catholic Church, Community Church, Community Health Centre – Early Childhood, Cricket Club, Cubs and Joeys, Cycling Group, Darts Social Club, Early Childhood Centre (MECCA), Field Day Committee, Garden Club, Kids Club, Local Landcare Group, Lions Club of Murrumbateman, Old School Grounds & Library Committee, Pony Club, Recreation Grounds Committee, Scouts, Stained Glass Workshop, Tennis Club, Cool Climate Wines, Youth Group.

All groups are relatively active within the local community and their individual details are available through the Murrumbateman website <http://www.murrumbateman.org.au>.

3.2.7 Weed Management and Control Regulations

Weed management on local government managed land and regulations relating to weed control on private land are managed in the Murrumbateman area by the Southern Slopes Noxious Plants Authority (SSNPA). The SSNPA produce a small guide to inform landholders of their weed control obligations, particularly those species listed under the *Noxious Weed Act 1993*. The guide is sent to all new landholders and includes some identification information for the most common species. The SSNPA monitor weeds on private lands using drive-by surveys, aerial surveys, and random inspections of properties arranged with the landholder.

When a property is found to have Class 1 (State prohibited weeds), Class 2 (Regionally prohibited weeds) or Class 4 (Locally controlled weeds) education information is sent to landholder. If a weed is not controlled after the

dissemination of education information, a control order is sent to the landholder that legally requires them to control the listed species present on their property.

In 2007, approximately 40 notices were issued in the Murrumbateman area to properties between 40 acres and 200 acres. Most notices were issued to the larger property owners. Although notices can be sent to properties as small as 2.5 acres, SSNPA does not usually focus on smaller properties.

3.3 Case study area – Wamboin

3.3.1 Location

Wamboin is a rural subdivision situated 32.5 kilometres northeast of Canberra. It is located 17.4 kilometres from Bungendore, its closest township, and 30.2 kilometres from Queanbeyan, its closest large commercial centre (see Figure 13).

For the purposes of this project, Wamboin includes the localities of Wamboin and that part of Bywong south of Macs Reef Road and thus corresponds exactly to the ABS State Suburb of Wamboin. The two localities reflect the dual development of the area, one end being developed from Sutton Road and has a Bungendore postcode, and is closer to Queanbeyan, and the other being developed from Bungedore Road and is closer to Bungendore. The two stages of development were joined after several years.

The Wamboin area correlates with the peri-urban PU2 typology (see Section 1.1). An historical overview of the Wamboin area is provided in Appendix 3.

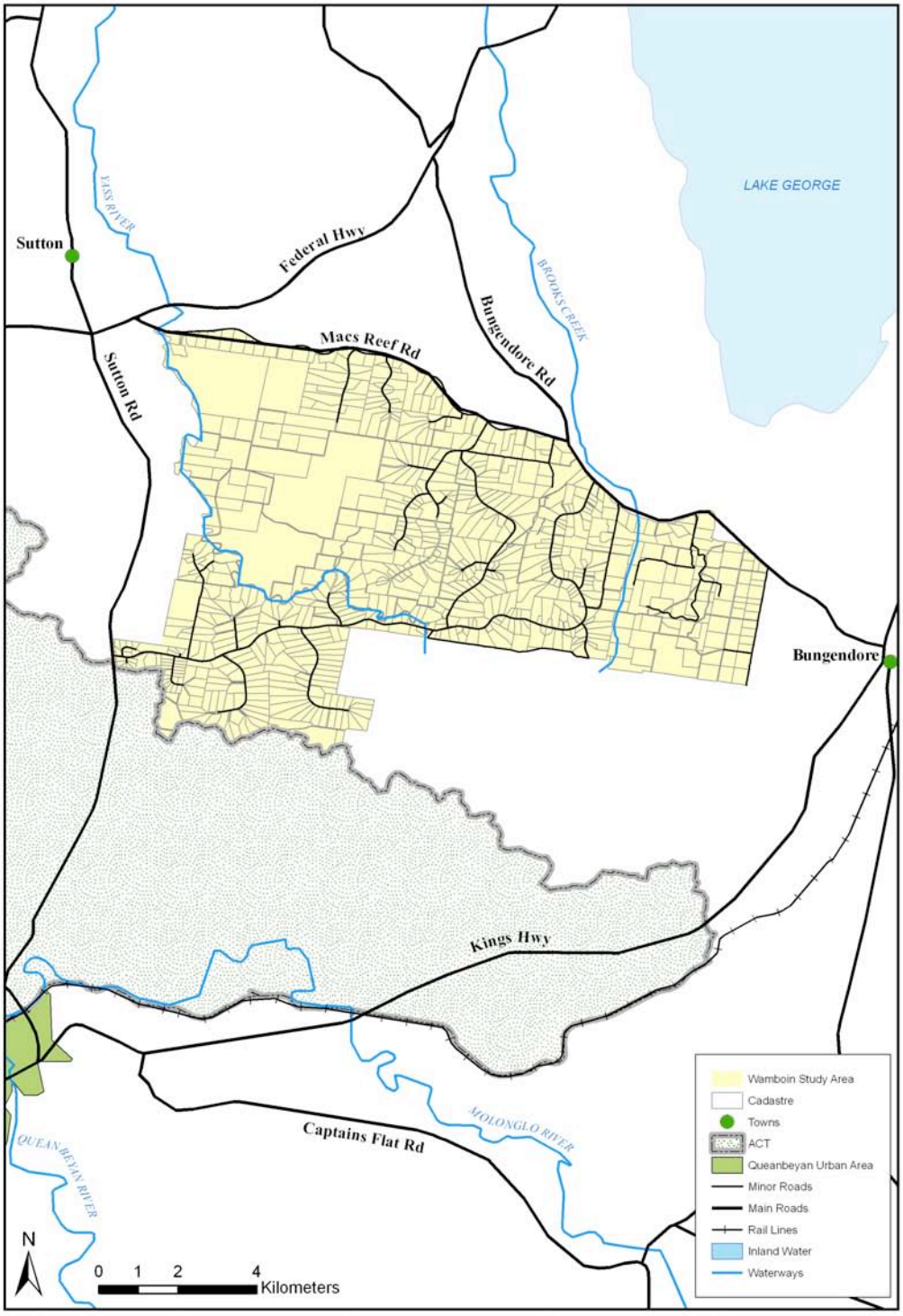


Figure 13: Wamboin study area

3.3.2 Demographics

The Wamboin CSA's population of 1980 persons comprises 47% males and 53% females. The community's principal demographics characteristics are summarised in Appendix 4 (ABS, 2006 census).

The largest age cohorts are the middle age groups from the 35–39 years cohort through to the 55–59 years cohort. Collectively, the five cohorts constitute 46.0% of the Wamboin's total population. There are also corresponding large cohorts in the youth groups from the 0–4 years cohort through to the 15–19 years cohort. This latter group comprises 29.6% of the total population. With just over three quarters of the Wamboin study area's population distributed in these age cohorts, there is a clear picture of the mature family group dominating the Wamboin area – a very similar situation to the Murrumbateman area. This conclusion is supported by Wamboin's average household size of 2.9, and its median age of 41 years.

The majority of the population (76%) are Australian born, with only 0.5% of Indigenous background. It demonstrated a high degree of stable residential mobility: 83% have resided at the same residential address one year prior to the census (2006) and 56% five years prior – again a very similar situation to the Murrumbateman area.

The population displays a slightly higher degree of education qualification than the Murrumbateman area (e.g. 34.8% hold a tertiary qualification and 45.8% have a qualification beyond school level). There are relatively high proportions of the workforce in the managerial and professional categories – in fact the Wamboin workforce has a much higher proportion of professionals (33%) than the Murrumbateman workforce does (24%).

The principal occupations of the Wamboin population are:

Managers	22%
Professionals	33%
Technicians and trades workers	10%
Community and personal service workers	8%
Clerical and administrative workers	16%
Sales workers	5%
Machinery operators and drivers	2%
Labourers	4%

There is a high degree of labour force participation (72.1%) and a correspondingly low rate of unemployment (1.9%). The four dominant industries of employment for the Wamboin area's population are:

Public administration and safety	24%
Professional, scientific and technical services	12%
Education and training	11%
Retail (replacing construction)	8%

As indicated by the population's education qualifications, occupations and industry of employment, residents in the Wamboin area enjoy a high degree of personal and household income. Some 44% of the workforce was in receipt of a gross individual weekly income of $1000 or more. Eighty-four per cent of households had weekly incomes that exceeded $1000, 54% were in excess of $2000 per week, and 24% exceeded $3000 per week. These figures are higher than the corresponding figures for the Murrumbateman study area.

3.3.3 Dwellings

The main dwelling structure in the Wamboin study area is the detached house (97% of dwellings), and there is a very high degree of home-ownership (38% owned and 55% purchasing). There are very few rental properties in Wamboin (8%); however, this area had a higher proportion of improvised homes and caravans (4%, compared with 1% for the Murrumbateman study area).

3.3.4 Amenities and Services

Wamboin has its own church, community hall, volunteer bushfire brigade, pony club, cub and scout groups, a farmers' market and, more recently, a women's group. A number of small businesses operate nationally and internationally from addresses in the area. The subdivision has no local shops: its closest township of Bungendore, together with the area's major centres of Queanbeyan and Canberra, provide residents with their essential services and employment.

As a small country village of old stone, brick and timber buildings, Bungendore has a number of specialty and basic shops, several rural suppliers and related industries that serve the surrounding grazing properties and the Wamboin subdivision. Due to their close proximity, the major centres of Queanbeyan or Canberra are also accessed for their services and employment opportunities. Queanbeyan and Canberra provide all facilities found in a city centre, including financial, community, employment and entertainment requirements.

Queanbeyan has emerged as the major town in the area. Since the Wamboin area developed as a small holding subdivision, mail has been delivered as

part of the Queanbeyan mail route. No garbage service is available, although there is a rubbish tip and private contractors service some properties in the area.

Further details on services available to the Wamboin study area are contained in the Infrastructure Report for Murrumbateman (Yass Valley Council) and Wamboin (Palerang Council) - see Appendix 5.

3.3.5 Transport Network

This area is not served by public transport other than a school bus service. Norton Road—the main road through Wamboin—is now heavily trafficked, not only by residents but also by traffic from Bungendore Road to and from Queanbeyan.

The Palerang Council has drafted the 'Palerang Social and Community Development Plan 2006/07–2010/11' to address the issues of smaller communities within its jurisdiction, such as Wamboin.

3.3.6 Social Network

Wamboin's demographically varied rural residential community is largely oriented towards Canberra and Queanbeyan. However, many residents also interact with Bungendore and participate in the facilities and organisations in that village, such as school, shops, medical, church, social and recreational groups.

Local organisations include: Wamboin Community Association, Bywong Community Association, Landcare, Rural Fire Brigade, Wamboin Women's Group and Wamboin/Geary's Gap Pony Club. The main community focus is the Wamboin Community Hall and Fire Shed, with lesser activities at the Anglican Church and the Bywong Community Hall and Pony Club. The Wamboin Community Association provides umbrella coordination for a variety of interest groups and a conduit to Palerang Council. It also runs a monthly newsletter, the *Wamboin Whisper*, which is distributed to more than 1000 households in Wamboin and Bywong.

3.3.7 Weed Management and Control Regulations

Weed management on local government managed land and regulations relating to weed control on private land are managed in the Wamboin area by the Palerang Council. The Palerang Council produces information to inform landholders of their weed control obligations, particularly those species listed under the *Noxious Weed Act 1993*. The guide is available on their website, and it includes some identification information for the most common species. The council monitors weeds on private lands by drive-by surveys and random inspections of properties arranged with the landholder.

When a property is found to have Class 1 (State prohibited weeds), Class 2 (Regionally prohibited weeds) or Class 4 (Locally controlled weeds), education information is sent to landholder. If a weed is not controlled after the dissemination of education information, a control order is sent to the landholder that legally requires them to control the listed species present on their property.

Although notices can be issued to town blocks, the council focuses predominantly on rural residential properties. Most notices have been issued to the larger property owners.

4. Study Results

4.1 Weed Issues

This section examines the species of weeds that are most commonly identified as being a problem on respondents' properties and how this compares with the species identified by government weed officers as the most common species found in the region.

4.1.1 Weed Species as Identified by Respondents

Respondents were asked if they controlled weeds on their property, and if so, what weeds were the 'biggest problem' on their properties. More than 8% of people did not list species that were a problem, although they noted that they controlled weeds. More than 4% of respondents specifically mentioned that there were species of weeds they could not identify.

The most commonly listed 'problem' species was Paterson's Curse (20%), closely followed by thistles (17%) and Capeweed (15%). All respondents referred to weeds by their common name rather than scientific name, therefore making it difficult to confirm if all common names referred to were the same species. For example, respondents referred to 'thistles'; so it was unclear whether the species was the Scotch Thistle *Onopordum species* (listed as a Class 4 weed) or a less invasive species.

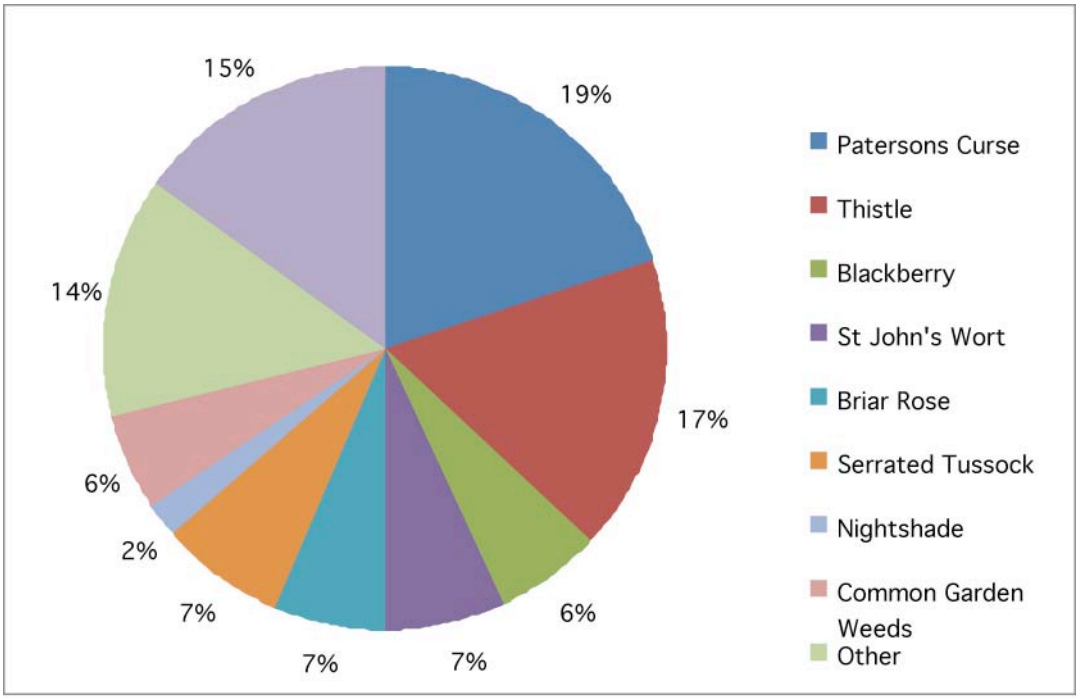


Figure 12: Weeds identified by respondents as a 'problem' on their property

It is interesting to note that, although the survey explicitly defined weeds as ‘Agricultural/environmental weeds, not garden weeds’ on the front page of the survey and at the beginning of the section relating to weeds, 7% of respondents listed common garden weed species under the weeds that were the ‘biggest problem on their property’.

A relatively significant percentage of the respondents (14%) listed a variety of other species. Some of these of note are:

Mallow Weed	1.6%
Broom (possibly mistaken for Gorse – C4)	1%
Pig Weed	1%
African Daisy	1%
Wild Radish (C4)	0.5%

4.1.2 Weed Species as Identified by Weed Officers

The weed officers were asked to list weed species most commonly reported in the case study areas. All species listed by the weed officer were Class 4 species in their area of jurisdiction. The six most common species identified by the respondents corresponded with species listed by the weed officers, with the exception of Capeweed, which is a common weed that can cause nitrate poisoning if it is the main feed (a common problem in drought conditions), but is not a Class 4 weed in the case study areas.

The weed officer from Wamboin listed Broom (Class 3 weed) as a new weed problem with new landowners due to garden escapees, while the weed officer from Murrumbateman did not (Class 4 weed). One per cent of the respondents listed Broom as a common ‘problem’ species, and all of these respondents resided in Wamboin.

It is interesting that Nightshade (a Class 4 weed in Murrumbateman) was mentioned by a small percentage of respondents, but it was not mentioned by the Murrumbateman weed officer as a common weed in that area.

It is important to note that the species that were not listed at all by respondents were African Lovegrass and Chilean Needle Grass. The Murrumbateman weed officer noted that Chilean Needle Grass was the greatest new and emerging weed problem in the region. Grass species weeds were generally underrepresented in the respondents’ list of problem weeds. The most common grass species listed was Serrated Tussock (Class 4),

although a very small percentage also listed Bindii, Couch and Paspalum, which are common garden weeds.

Respondents were also asked which of the species not found on their property were known to be a problem in their region. The majority of respondents listed the same top six species listed in Table 5. Only two respondents from larger (100–200 acre) properties listed African Lovegrass (Class 4 weed).

Table 5: Comparison of respondents' and weed officers' weeds of concern

Respondent listed species	***Percentage of respondents***	***Weed officer top 10 species (W = Wamboin M = Murrumbateman)***
Paterson Curse (C4)	20.0%	Patterson's Curse (W, M)
Thistle (C4)	17.0%	Thistle (W, M)
Capeweed (C4)	15.0%	
Serrated Tussock (C4)	7.0%	Serrated tussock (W, M)
St Johns Wort (C4)	7.0%	St Johns Wort (W, M)
Briar Rose (C4)	6.5%	Briar Rose (W, M)
Blackberry (C4)	6.0%	Blackberry (W, M)
Nightshade (C4)	2.0%	N/A
Wireweed (C4)	2.0%	N/A
Mallow Weed	1.6%	N/A
Broom (C3–Wamboin and C4–Murrumbateman)	1.0%	Broom (W)
Pig Weed	1.0%	N/A
African Daisy	1.0%	N/A
Wild Radish	0.50%	Wild Radish (M)
Not listed by residents	0.0%	African Lovegrass (M) (C4)
Not listed by residents	0.0%	Chilean Needle Grass (M) (C4)

4.2 Awareness and Knowledge of NRM

This section examines rural lifestyle landowners' levels of awareness and knowledge of NRM.

4.2.1 Property Management Experience

Nearly one half of all respondents (47%) had previously lived on a rural property at some time in their life, and just over one third (37%) stated they had previous experience working on a rural property.

A relatively high proportion of respondents (42%) considered that they had a poor knowledge of NRM prior to purchasing their current property, compared to 6% who rated their NRM knowledge at that time as excellent. NRM was defined as including: legal requirements and methods of weed control through to pasture and soil quality management. Conversely, only 14% of respondents considered they had poor NRM knowledge after the purchase of their property. Although the number of respondents who now considered that they had an excellent knowledge of NRM had doubled, there was not the same corresponding improvement as those with 'poor' knowledge. Interestingly, there were quite large perceived improvements in NRM knowledge amongst those who considered that they had some knowledge of NRM – categories 2 and 3 (from 17% to 23% and from 13% to 32% respectively). Table 6 documents these changes in perceived NRM knowledge.

Table 6: NRM knowledge (pre-purchase and current)

Degree of NRM knowledge	***1 (poor)***	***2***	***3***	***4***	***5 (excellent)***
Knowledge prior to purchase	42%	21%	17%	13%	6%
Current knowledge	14%	20%	23%	32%	11%

Respondents identified a range of reasons for their improvement in NRM knowledge, including:

> *Self-education* (largest means): own research, reading, local experience (trial and error in some cases), field days, and meetings. One respondent cited “own research as no-one will help on specific property issues”. Another was motivated to be “self educated after complaints from broadacre farmers”.
>
> *Formal education* (minor number): one respondent had completed the Pro-graze Course through CIT, and another had completed a TAFE course.
>
> *Landcare membership*: a noticeable number of respondents cited Landcare as a major source of information, especially their meetings, field days and other activities (Landcare was the most commonly nominated network that respondents were active members of).

NRM knowledge sources included: local farmers; locals; neighbours and other landowners; local Landcare groups; council (including the weed officer); the Rural Lands Protection Board; the Internet; and specialists, particularly horticulturalists and agronomists. Typical of this latter group was the respondent who “got a horticulturalist to walk over the property with me to help ID weeds”. Only 10% of respondents claimed they received property management advice from their real estate agent at the time of the purchase of their property.

The importance of property management experience was summed up by one respondent who noted that they “have learnt through experience that four horses is too many for seven acres during drought”.

4.2.2 Perception of Weed Management Responsibilities

The majority of respondents (60%) considered that there was inadequate weed control on public land in the Murrumbateman/Wamboin area (e.g. road reserves, parks) – see Figure 14.

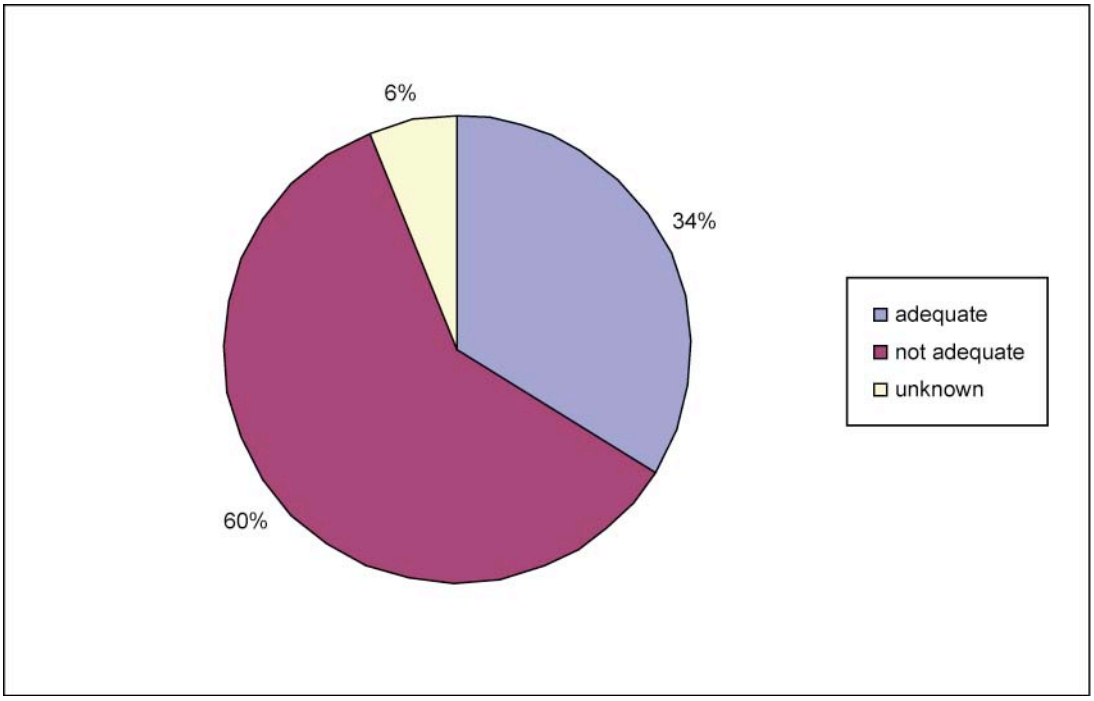


Figure 14: Perception of adequacy of weed control on public land in the Murrumbateman/Wamboin area

Respondents overwhelmingly saw their local council (61%) as being responsible for the management of weeds on public lands, compared to voluntary groups such as Landcare (13%) or a state agency (10%). A further 16% thought other agents should be responsible, ranging from the Catchment Management Authority, the Rural Lands Protection Board, various neighbourhood or community groups to individual landholders. State agencies identified included the departments of Primary Industries, Natural Resources and the Environment (clearly a mix of New South Wales and ACT agencies).

4.2.3 Sources of NRM and Property Management Information

Overall, 94% of respondents sought NRM information, and 6% did not. Nearly one third of the respondents' current primary sources of information on property and NRM were their local council or government agencies. Landcare also constituted a commonly accessed source (25%). The principal sources relied upon for NRM and property management information are in Table 7.

Table 7: Sources of NRM and property management information

Information Source	*% of Respondents*
Council/government	34%
Landcare	20%
Internet, books	14%
Neighbours, friends and family	9%
Produce stores	8%
Other	11%

4.2.4 NRM Topics Sought

The primary NRM topics that were sourced are tabulated below. The most sought after information was in relation to weeds (44%).

Table 8: Primary information topic sought

Primary NRM Topic	*% of Respondents*
Weeds	44%
General	18%
Permits	14%
Pest animals	7%
Native plantings	6%
Other	11%

The ‘general’ NRM information category included: pest and diseases; plant advice especially natives; soils and erosion control; herbicide, chemicals and fertiliser; and dam construction. A number of respondents listed unspecified generic information.

Sixty-eight per cent of respondents could not nominate any additional sources of information or financial help that they had not yet used to help manage NRM. The few respondents that did so, nominated councils, Landcare, the Rural Lands Protection Board, volunteer bushfire brigade and the Internet as potential future sources to access information of weed identification and control, plantings, trees, fire hazards and dam building.

4.2.5 NRM Education

An overwhelming majority (75%) of respondents had not undertaken a short course in NRM. The topics that were covered by the remaining 25% who had completed a course included:

Pastures	20%
Soils	18%
Weeds	16%
Salinity	13%
Plant ID	13%
Farm planning	10%
Native animals	5%
Other	5%

One formal course that one respondent had completed was the Prograze course. All respondents who had completed a course said they were utilising the information gained from the course to manage their properties. Interestingly, 78% of those who had not done a course said that they would consider doing one in the future.

The range of short NRM courses that had been completed by respondents is illustrated in Figure 15.

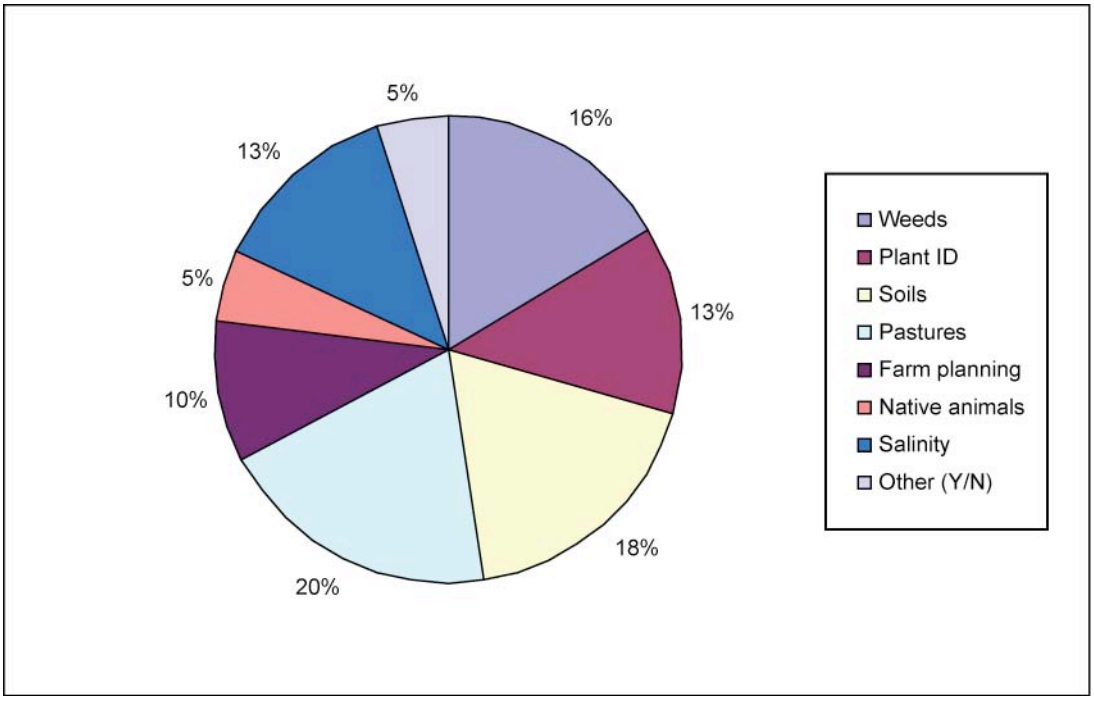


Figure 15: Short NRM course undertaken

4.3 Attitudes, Motivation and Capacity

This section considers the attitudes, motivation and capacity of rural lifestyle landowners to undertake their landscape and weed management responsibilities.

4.3.1 Perception of Responsibility for NRM

Respondents overwhelmingly thought that the private landowner should be responsible for weed control on their properties (79%). Surprisingly, 13% thought that this responsibility rested with the council and a further 8% cited a government agency.

4.3.2 Weed Recognition

Respondents were asked to complete a weed identification test by ticking the images they recognised as weeds. The test results showed that respondents had a surprisingly good knowledge of weeds – 70% scored 80% or higher on the test, and the overall average score was 79%. The range of scores is illustrated in Figure 16.

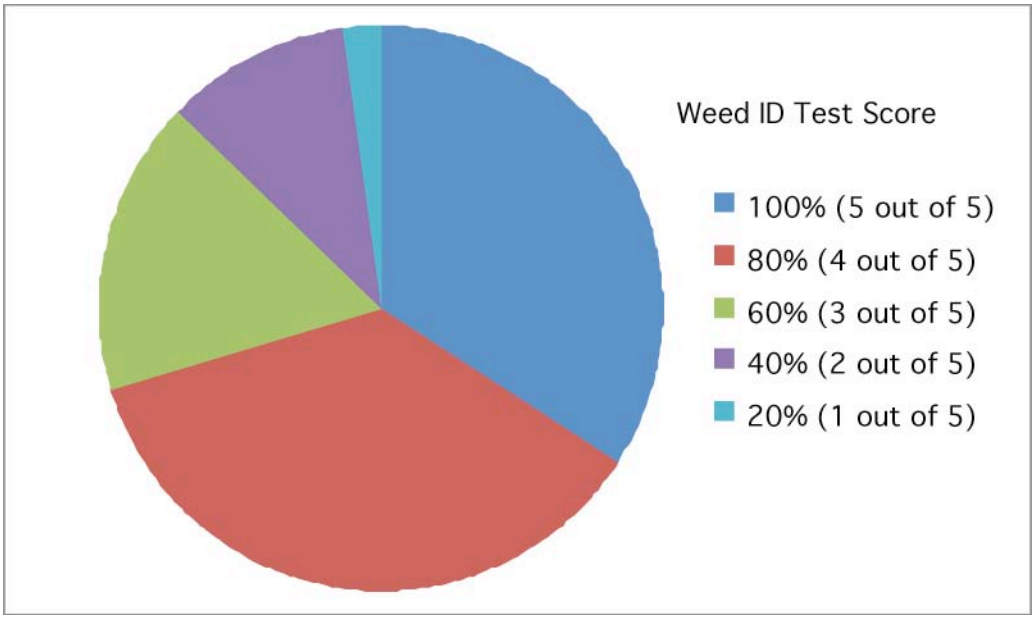


Figure 16: Weed identification test results

The weed identification test also included four images of natives that looked similar, but are quite distinctive, from common weeds. By not selecting these images, respondents indicated they knew these plants were not weeds.

The results from this aspect of the test confirmed that respondents had a surprisingly good knowledge of weeds. Although the scores were not as strong as the weed specific results, 32% of respondents did not identify any of the native plants as weeds. The overall average score across all respondents was 60%.

The ranges of scores are as follows:

4 out of 4 correct	32%
3 out of 4 correct	37%
2 out of 4 correct	18%
0 out of 4 correct	23%

The most common reason cited by respondents for their concern of weeds was their invasive nature, and thus the potential to spread across their property. Only a small number noted the poisonous nature of the weeds and their harmful effect on animals (horses).

4.3.3 Constraints

In terms of wishing to do more NRM on their property, 81% of respondents said they did. However, they cited the following as the single most limiting factors:

Lack of time	36% (of respondents wishing to do more)
Lack of money	23%
Lack of knowledge	21%
Lack of equipment	14%
Other	6%

‘Other’ limiting factors included: lack of labour resources; lack of energy; lack of suitable contractors; and the lack of a coordinated approach across the district.

4.4 Current Management for NRM

This section examines the rural lifestyle landowners’ current levels of NRM on their properties.

4.4.1 Current Management Effort

In terms of the current levels of property management for NRM, respondents indicated that in the week prior to the survey they had spent the following hours of personal work:

>10 hours	31%
8-10 hours	12%
5-7 hours	22%
2-4 hours	14%
<2 hours	18%
nil	3%

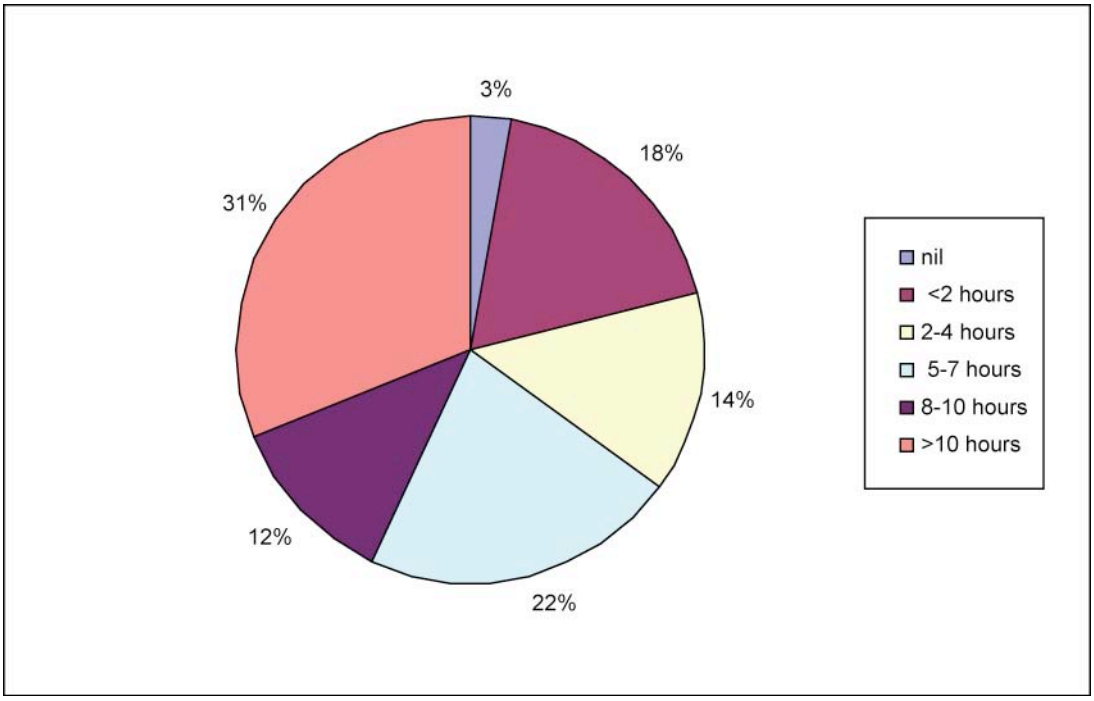


Figure 17: Time spent working on property (hours per week)

Specifically, in terms of weed control, the respondents reported that weekly effort in this regard was inversely proportional to their previously mentioned weekly efforts in property management. Whilst the bulk of respondents' weekly efforts tended to be in the upper end of the time spent, most had spent limited amounts of time on weed management. For example, whilst 65% of respondents had put in five hours or more of property management effort, almost 90% had only spent four hours or less (including none) on weed control (see Figure 19).

Respondent's weekly effort in weed management (Figure 18) included:

>10 hours	1%
8-10 hours	6%
5-7 hours	4%
2-4 hours	29%
<2 hours	43%
nil	17%

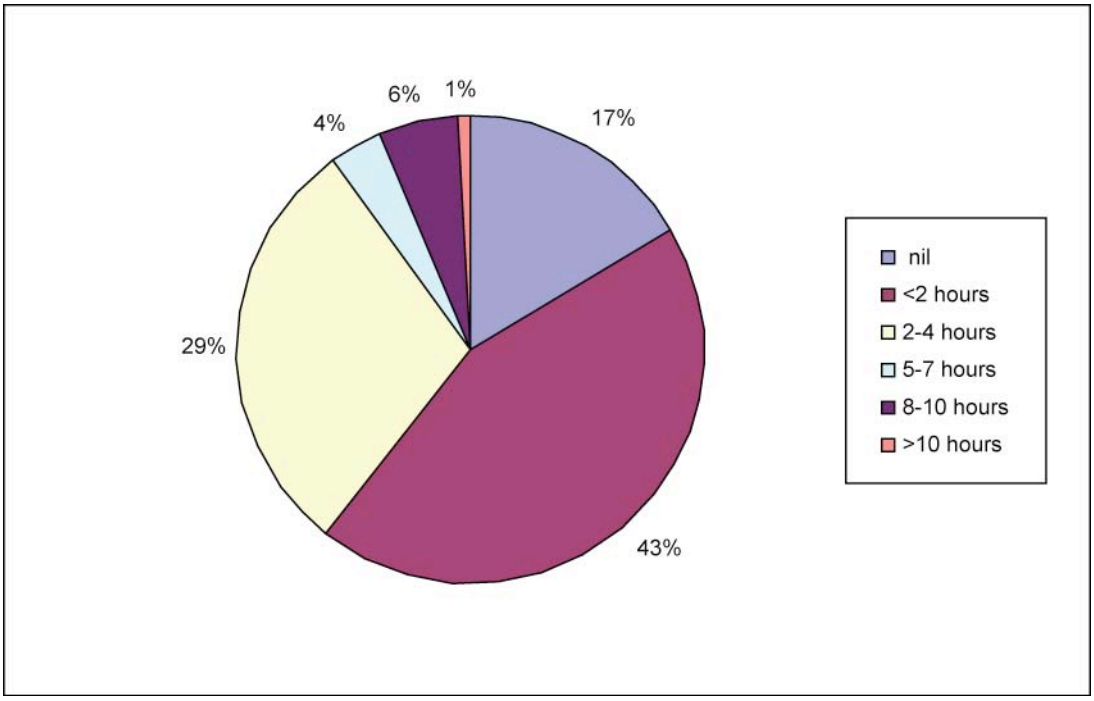


Figure 18: Time spent on weed control (hours per week)

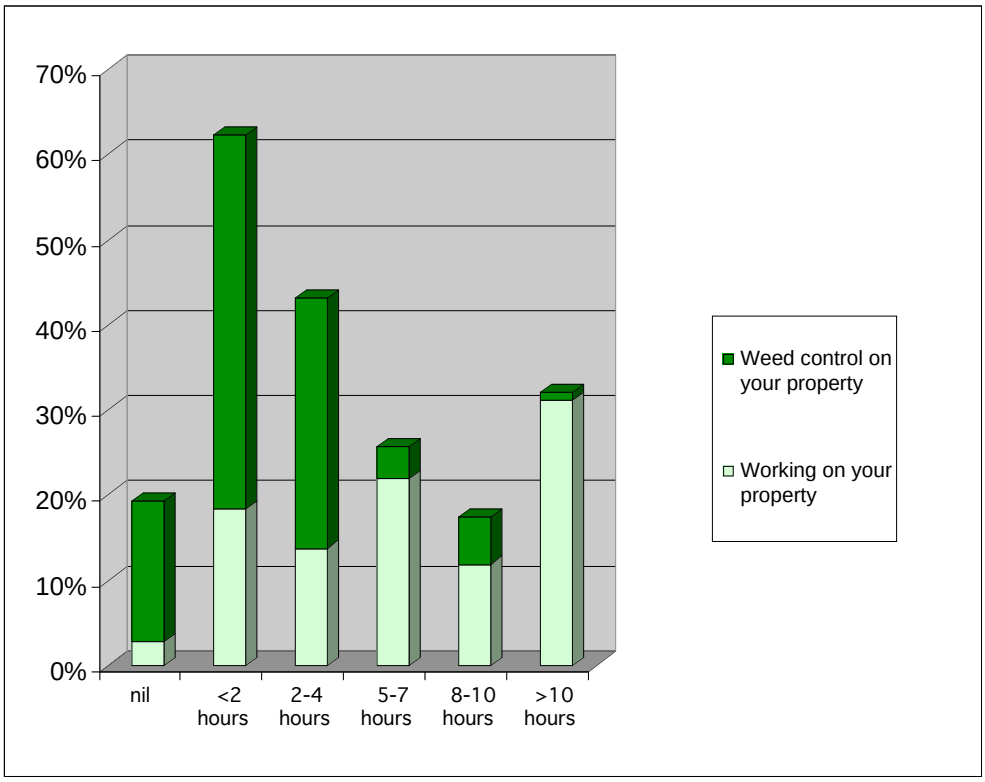


Figure 19: Comparison of time spent on property management to time spent on weed control

4.4.2 Weed Management

The most favoured methods of weed control used by respondents were “digging out the weed” (46%) and “self-spraying” (44%). Two respondents used a form of bio-control. Only 6% claimed that they used contractors for this task. The weeds nominated as the biggest problem on their properties have previously been reported (see the section on weed issues).

In terms of the most time-consuming task involved in property management, respondents nominated the following:

Gardening	40% (of respondents)
Mowing	19%
Caring for stock	15%
Weed control	12%
Maintenance	6%
(Other	8%)

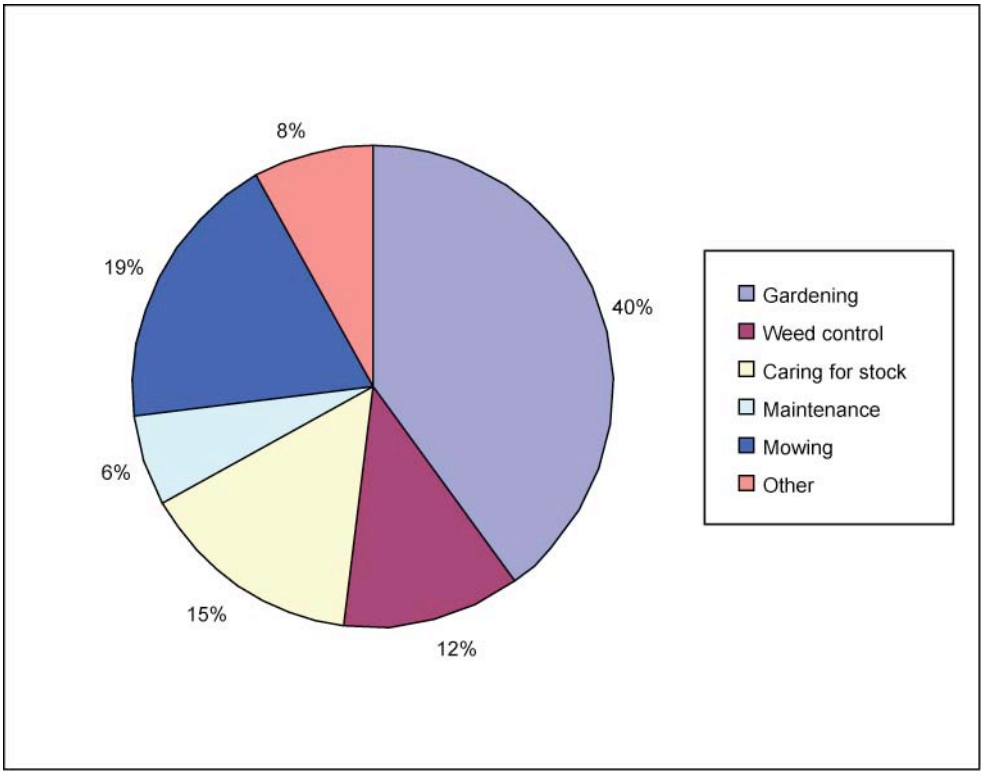


Figure 20: Most time consuming tasks

The second most time-consuming tasks reported by respondents were:

Gardening	24% (of respondents)
Maintenance	17%
Weed control	16%
Fencing	14%
Caring for stock	7%
Mowing	6%
(Other	17%)

Clearly, weed management (including gardening) is foremost in respondents' minds in terms of property management. It is seen as a significant task that competes for their time. One respondent summed up their thoughts in relation to the matter:

> "Perhaps the most important resource to aid weed control is a colour brochure which identifies 'local' problem weeds with information on how best to eradicate those weeds (we need info on land AND water weeds – thanks)".

4.4.3 Tools and Equipment

Respondents reported that they used a variety of tools and equipment to manage their properties. The most used piece of equipment was the spray pack (used by 62% of respondents), followed by the ride-on-mower (34%) and a variety of garden/hand tools (30%). These responses correlate with the reported most favoured methods of weed management (see Section 4.4.2). Respondents also used utilities (24%) for property management, along with heavier equipment such as tractors (16%), trailers (9%), slashers (4%), and kanga mini diggers and bobcats (4%). Small numbers of a variety of other tools and equipment were also mentioned, including: rotary hoes; chainsaws; scarifiers; mulchers; seeders; whipper-snippers and brush cutters; and fencing tools. One property also employed a water cart.

Personal tools and equipment were supplemented by hiring equipment. Commonly hired equipment related to earthworks and fencing (e.g. bob cats, backhoes, excavators and post hole diggers). Slashers, fertiliser spreaders and fencing equipment were also mentioned. The water cart used on one property was hired.

4.4.4 Use of Contractors

A total of 60 respondents (52%) reported that they had used a contactor to undertake work on their property in the 12 months before the survey. The range of contracting services that were accessed is tabulated below.

Table 9: Use of contractors

Contracting Services	***% of respondents***
Water carter	29%
Fencing	25%
Construction (e.g. sheds)	19%
Trade repairs	5%
Weed control	5%
Slasher	2%
Other	15%

Six respondents (5% of all surveyed and 10% of those who had used a contractor) listed weed spraying as one of the contract services they had used. Most had properties smaller than 5 acres. A small number of respondents sourced contractors for alpaca and sheep shearing and crutching, direct drilling, landscaping, tree removal and dam cleaning.

4.5 Engagement and Dissemination Options for NRM

This section considers the optimum approaches to engage rural lifestyle landowners on weed management and the opportunities to disseminate NRM information amongst this group.

4.5.1 Rural Lifestyle Landowner Networks

The statistics regarding membership to a formal NRM group such a Landcare highlighted some interesting perspectives. For example, 20% claimed to belong to a Landcare group. Of the remaining 80% that did not belong to a group, nearly one third (31%) said that they would consider joining. What is equally revealing are the reasons respondents provide as to why they are NOT members. By far the most overwhelmingly cited reason was a lack of time, including work and children (67% of all those who had originally responded that they were not members). Interestingly, six respondents had previously been members but had left or let their membership lapse – one

noting, "… was in Landcare but left due to focus on commercial farming". Another respondent had a similar view, claiming, "… that's for farmers".

A further three respondents claimed they were unaware of the existence of these groups and another had just moved into the area and who noted: "I am new to the area, would like to preserve nature and help with community but am having trouble finding out who the community is yet." Four would not join due to the "local politics of such groups" or to the "inappropriate or unusual tactics", whilst another was "not sure they are effective in relation to small properties".

However, as suggested by the typology of new peri-urban landscape managers, rural lifestyle landowners have a vastly different range of personal interests, priorities and leisure activities to the traditional rural landowners that have been the subject of much NRM focus to date. It is to these networks of the rural lifestyle landowners that future NRM efforts in peri-urban zones such as the Murrumbateman and Wamboin case study areas should now be targeted in addition to Landcare.

Respondents indicated that they were actively engaged in a range of local social networks. Many of these revolved around their primary leisure activities, especially those associated with their reasons for choosing their peri-urban location, such as ownership of horses, dogs and other domestic animals, gardening and the like. Others, it was noted, were associated with the sporting interests for themselves and their families (see Section 3.1.1 for a fuller discussion on these leisure interests). The full range of social networks in the case study areas has previously been identified (see Sections 3.2.6 and 3.3.6).

4.5.2 Information Transfer

Previous sections have reported on respondents' current sources for accessing NRM and property management information as well as the specific topics that they sought (see Sections 4.2.3 and 4.2.4). Respondents' preferred methods of receiving *free* information on NRM were:

Fact sheet/booklets	25%
Internet	21%
Newsletters	17%
E-newsletters	13%
Courses and field trips	12%
Community meetings	7%
Home visits	5%

The abovementioned responses that are related to the Internet and electronic forms of information exchange will need to be noted in relation to the current levels of Internet connections (77% of all respondents) and broadband (58% of all respondents) in these areas – see Section 3.1.5.

Only 51% indicated that they were prepared to pay for this information. The forms of NRM information exchange that this group indicated that they were prepared to pay for included:

Courses and field trips	47%
Factsheet and booklets	29%
Home visits	24%

Respondents saw the responsibility for the provision of NRM information as:

Printed information

Council	40%
Government	28%
Landcare	27%
Other	5%

Training Courses

Council	37%
Government	31%
Landcare	26%
Other	6%

In terms of which specific state agencies or other organisations that had responsibility for disseminating NRM information, respondents identified the: Rural Lands Protection Board, the Department of Agriculture, Department of Environment and Climate Change, the Catchment Management Authority, and the Friends of Grasslands. They also noted that councils needed the support of state agencies to undertake this role. A number of respondents volunteered that they were unsure who was responsible.

Interestingly, this study has identified that Yass Valley Council has produced a ‘Newcomers Kit’ containing information about services and rural residential area basic land management information for new ratepayers. Palerang Council currently produces a weeds brochure and distributes it to ratepayers

and a newcomers kit, similar to that produced by Yass Valley Council, is under preparation.

One respondent summed up what they considered to be the priority need in information transfer as follows:

> "While there are people moving from an urban to a semi-rural environment it is important for all organisations and institutions to provide appropriate advice to ensure a sound transition. Most people try to do their best for their land and stock and should be able to avail themselves of information and advice. For example, fire precautions are often overlooked and trees are planted too close to houses/outbuildings."

4.6 Social Conflict

This last section briefly considers the degree of conflict between rural lifestyle landowners and other peri-urban landscape residents and managers (including traditional farmers)

4.6.1 Annoyances

Respondents cited a range of local annoyances and frustrations as impacting on their current lifestyles (see Table 10).

Table 10: Annoyances and frustrations

Annoyances and Frustrations	***% of Respondents***
Lack of services	23%
Weed infestation from neighbours	14%
Dogs	14%
Other (see below)	13%
Road issues	10%
Lack of NRM support or help	9%
Noise	7%
Trail bikes	6%
Increased development	5%

Nearly one quarter of all annoyances and frustrations related to a lack of services. These concerns included unreliable electricity supplies, waste disposal challenges, and poor telephone and broadband communications.

From an NRM point-of-view, respondents cited ‘weed infestation from neighbours’ and ‘straying dogs’ (including wild dogs attacking stock) as being of concern. Overgrazing and straying stock, especially during droughts, were also cited as an annoyance and frustration. Interestingly, very few direct annoyances with traditional farming practices were cited. The few that were reported involved spray drift and noise from farming operations.

Road issues resolved around speeding vehicles, trucks and poor road conditions. Dust from unsealed roads and machinery was also noted as a problem.

Thus the majority of reported annoyances and frustrations of respondents from the case study areas can best be summed up as being related to ‘urban’ and ‘neighbourhood’ issues.

Overwhelmingly, the majority of formal complaints that were lodged related to dogs. There were also minor numbers of complaints noted that related to poor land management by neighbours (e.g. slashing serrated tussock when in seed), illegal discharge of firearms and fireworks, stray stock, speeding vehicles, road conditions, and poor services provision.

The majority of complaints were lodged with the respondents’ local councils, especially in relation to dogs. Other foci for complaints have been the Rural Lands Protection Boards, Telstra, and the police. Some respondents indicated that they took their complaints directly to their offending neighbour. Whilst many of the complaints were resolved, it was also reported that no action was taken in a number of cases.

4.6.2 Other Concerns

A range of other issues and concerns were raised by respondents. These included:

- Weed control needs to be addressed on a whole community basis. One respondent cited Patterson’s Curse, St Johns Wort, and Serrated Tussock as thriving in vast areas of properties, on roadsides and on crown land.

- Overgrazing is a problem. Interestingly, one respondent saw council as needing to be more actively managing degradation caused by overgrazing.

- The level of the watertable and number of bores has changed over the years. One respondent thought that “Yass Council should put an end to

> housing developments … mainly because of the water situation". Another reason for this concern was the establishment of wineries and their deep bore practices.

Perhaps the most revealing indication of future potential social conflicts can be summed up by the comments from one respondent:

> "My greatest concern about my rural area is the type of people moving here. This is not a town or city and should not be providing the same services e.g. sealed roads, street lighting, mains water, etc. which all affect the environment and natural habitat. I am concerned about feral animals and uncontrolled domestic animals, excessive use of water for gardens i.e. keeping lawns green. Overstocking on small blocks causing erosion, weeds, dust, poor animal management. Lack of passive design utilised by councils as a normal code i.e. locating buildings for effective heating and cooling by environment rather than an over use of electricity."

5. Towards a Way Ahead

Five key research questions have provided direction and guidance to the conduct of this research project, including the implementation of the surveys of residents of the Murrumbateman and Wamboin case study areas and agency personnel with weed management responsibilities. A number of assumptions were also proposed in relation to the likely behaviour of the general approaches used by rural lifestyle landowners to manage their properties and, more specifically, to control weeds (also see Section 1).

The following discussion summaries the research findings in relation to the key research questions and addresses whether the research findings confirm these assumptions.

5.1 Drivers of Change

Research Question 1: What drivers of change are influential in attracting the new wave of peri-urban dwellers (rural lifestylers) to these locations and what are the characteristics of the lifestyles they are pursuing?

Research Question 2: Are these drivers and trends likely to continue in the near future?

The principal influential drivers of change that have attracted rural lifestyle landowners to the Murrumbateman and Wamboin areas were clearly related to lifestyle, they were associated with the rural landscape and its openness in terms of space. Hobby farming and horse-related interests and activities were also part of these motives. In fact, a quarter of all properties supported horses – most had two horses. Other animals grazed on these properties included alpacas, sheep and cattle. Clearly, the idea of self-sufficiency was a strong motivator for the range and number of livestock being kept on these properties as well as their use for growing produce for non-commercial purposes.

The non-agricultural economic use of these peri-urban properties is highlighted by the fact that nearly 90% of all property owners do not derive any income from their properties. So who then are these rural lifestyle landowners and what are their distinguishing attributes that relate to these drivers of change affecting these peri-urban areas?

5.1.1 The Rural Lifestyle Landowners

The majority of the rural lifestyle landowners belong to the upper young to middle adult age group (24–54 years), living as predominantly two person households and as traditional family groups with one or two dependent children. They are well-educated and highly qualified: the majority are in full-time employment, with a third belonging to the public service. Almost one fifth of residents were retired.

Residents displayed relatively low degrees of residential mobility: there was an extremely high degree of 'home ownership' (99%) in relation to their primary place of residence.

These attributes correlate with the demographic characteristics of Murrumbateman and Wamboin from the 2006 ABS census.

There is a very high degree of car ownership amongst the residents from this typical peri-urban commuting zone. An overwhelming majority of all commuter trips (75%) are for employment purposes – Canberra is the principal destination. The major implication is that most residents are commuting relatively long distances for employment purposes and spending considerable time in doing so. For example, more than two thirds of commuters are spending up to seven hours commuting in a week. Proximity to Canberra, presumably for employment access, was also noted as an important locational criterion.

The survey data confirms the 'new actors' that are now responsible for the management of these peri-urban landscapes of Murrumbateman and Wamboin are essentially from the 'Seekers' and the 'Survivors' groups, including in particular, 'Tree changers', 'Blockies', 'The horse community' and 'Adaptive farmers' (see Section 1 and Figures 2 and 3).

5.1.2 The Rural Lifestyle Properties

Just over one half of all properties were small lots (less than 10 acres [4 hectares]), where the predominant lot size of 5–9 acres accounted for one third of all properties. The majority of properties were serviced by gravel access roads that were typically 100–200 metres long.

The case study areas' rural nature suggests that properties should lack the normal range of urban services, such as town water and sewerage. Contrary to this notion of a rural living environment, most properties were serviced by mains electricity and a daily postal delivery service. On the other hand, none of the properties had access to reticulated town water, with the majority having tank water instead.

There was also a high incidence of farm dams throughout the case study areas: nearly 80% of all properties had at least one dam. The primary purpose for these water storages was stated as fire protection and stock watering. Whilst not conclusive, there appears to be large volumes of water retained through these on-farm storages. More than one third of all properties also utilised bore water.

Three quarters of properties did not have a council solid waste disposal service, with the majority undertaking this task themselves.

In terms of telecommunications, most residences were serviced by a landline with more than three quarters having Internet connection, of which half were on broadband. Nearly three quarters of properties had mobile phone coverage.

The predominant use of these properties related to equine activities with a quarter of all properties supporting an average of two horses each. Almost all properties had a dwelling and were well developed in terms of private recreational facilities (e.g. swimming pools) and built infrastructure oriented towards equine activities (e.g. stockyards, stables and dressage arenas).

5.1.3 Future Trends

The evidence from this research suggests that the previously noted principal influential drivers of change are likely to continue to exert a strong influence. An insight into future trends can be gauged from the future intentions of the current group of rural lifestyle landowners. Two thirds of residents saw themselves staying on their properties indefinitely. Only a very small minority (3%) intended leaving within five years.

There is also evidence of reasonably well-developed and maturing social and commercial networks in both case study areas to support the continuation of the emergent lifestyles of the rural lifestyle landowners.

5.2 Weed Management Responsibility

Research Question 3: What are the priority weed management challenges for existing peri-urban areas?

Most residents considered that the primary responsibility for weed control on their properties rested with them. Of concern, however, is the 20% of residents who responded to this survey that thought that the responsibility for weed control on their properties rested with their council or a government agency. Residents also considered that there was inadequate weed control on

public land in the Murrumbateman and Wamboin areas. There was an overwhelming view that this responsibility rested with their local Council. Landcare, state and territory agencies, catchment management authorities, and the Rural Lands Protection Board were also identified by a small number of residents.

5.2.1 Weed Management Challenges

The most common property concern cited by residents was the invasive nature of weeds. However, only a small number noted their possible poisonous nature and harmful effect on stock. Weed management (including gardening and maintenance) were the two most time-consuming property management tasks for residents. It was seen as a significant task competing for their time.

Surprisingly, the residents surveyed displayed a good knowledge of weeds in terms of their recognition, and a smaller number made correct distinctions from native plants. However, although the survey explicitly defined weeds as ‘agricultural/environmental weeds, not garden weeds’, a number of residents cited common garden weed species in their responses. This suggests a possible inability to make that distinction. Also, during the survey, all respondents referred to weeds by their common name rather than their scientific name, and a small number acknowledged that there were species of weeds they could not identify.

With one exception, most residents identified the same six most commonly reported weeds (all Class 4) that were reported by council weed officers as relevant to the case study areas. Disappointingly, however, none of the residents named weeds that are new to their areas.

Other priority weed management challenges perceived by residents related to their knowledge of NRM generally. Of concern is the relatively high proportion of residents who considered that they had a poor knowledge of NRM prior to purchasing their current property (NRM was defined as including legal requirements and methods of weed control through to pasture and soil quality management). Interestingly, and in view of the previously noted residential stability of property owners, the group who considered that their NRM knowledge prior to purchase was ‘poor’ appeared to gain knowledge some time after purchase. In fact, most residents perceived that they had major improvements in NRM knowledge since the time that they purchased their properties. This was largely achieved through self-education and experience. A smaller number had completed formal CIT and TAFE courses, and a noticeable number cited Landcare as a major source of information, especially meetings and field days. Other sources of NRM knowledge included: local farmers; neighbouring landowners; council (including the weed officer); the Rural Lands Protection Board; the Internet; and specialists, particularly horticulturalists and agronomists. Only a very small number claimed they

received property management advice from their real estate agent at the time they purchased their property.

In terms of specific property management information sought, nearly two thirds of residents sought advice on a range of NRM related topics, including weeds, pest and diseases, plant advice especially natives, soils and erosion control, herbicide, chemicals and fertiliser, and dam construction. Interestingly, weeds information accounted for nearly three quarters of this sought-after information.

With the extremely high incidence of horse-related activities and equine associations, stock management becomes a critical link to the incidence of weeds in the case study areas. There was a very high incidence of horse movement to and from properties, with nearly one half of residents using their own truck or float. Nearly three quarters of all horse properties imported hay as stockfeed. Other imported animal feed included grains, lucernes, chaff and straw. Most of this stock feed was sourced from the produce store, and minor amounts were imported through agents who were sourcing their supplies from Canowindra, Young and Deniliquin.

5.2.2 Current Management Efforts

Time spent on weed control by residents was, surprisingly, inversely proportional to their weekly efforts in property management. Whereas one third spent more than ten hours a week in property management, and nearly two thirds were spending five hours or more each week managing their properties, 90% were spending four hours or less on weed management. This included nearly 20% of residents who were not spending any time at all on this task.

Nearly one half of residents undertook weed management through ‘digging out the weed’; a further half used ‘self-spraying’ – all physically intense and time-consuming techniques. Only a very small number of residents used a form of bio-control. A further 6% used contractors for this task.

5.2.3 Priority Challenges

Consequently, the biggest perceived challenges appear to be knowledge of weeds and a lack of time to manage them. Residents lacked knowledge of NRM (including weeds), especially at the time of property purchase. They also lacked up-to-date knowledge of weeds new to their district. Hence it will be imperative to ensure that all property owners are aware of their weed management responsibilities and have access to the latest information and management knowledge.

The second major challenge facing residents concerns the time that they had available to complete these essential management tasks.

There was also suggestions that, whilst individual property weed management was essential, it needed to be part of a larger district effort that included all public lands and involved public land managers such as the council and relevant state and territory agencies. This collective effort would also have to include their neighbours, as residents reported that local frustrations and annoyances that impacted on their current lifestyles included ‘weed infestation’ and ‘straying dogs’ from neighbouring properties.

There also appears to be a need to better inform horse owners of the potential for equestrian-related activities to be a vector for new weed species. Activities such as the purchasing of feed from unknown sources (particularly during drought) and the movement of horses between regions and states are high risk for the introduction and spread of some weed species.

Thus the question remains: can property owners do more in terms of weed management?

5.3 Motivation

RQ 4: Do rural lifestylers have the necessary motivation, capability and capacity to properly address existing and emergent NRM issues, particularly invasive weeds, on their properties?

Rural lifestyle landowners noted that the most common aspiration in terms of future plans for their properties was native habitat restoration. There was also a consistently strong expressed desire to make more use of their properties particularly for self-sufficiency purposes (including establishing vegetable gardens, permaculture initiatives, and horticultural greenhouses). This also included a host of property improvements including: pasture improvements; infrastructure development (e.g. dressage area and swimming pool); establishing gardens; and building construction (e.g. house extensions, sheds, studios, greenhouses).

A small number of residents also indicated plans to add additional stock such as horses, ponies, sheep, goats and llamas. Other future plans included the establishment of commercial operations such as orchids, olive groves, and mixed berry farming.

Interestingly, only three residents mention future plans involving weed control on their properties, despite residents previously noting that this was their primary responsibility.

5.3.1 Capability and Capacity

It appears that while rural lifestyle landowners do have a reasonable range of available leisure time, they also belong to a large number of community organisations – many associated with equine interests. These commitments, along with their family commitments, leave only limited time for property maintenance. Although residents' principal leisure activity was overwhelming gardening, only a small number considered working on their property as a leisure activity.

An additional indication of capacity of residents for land management and weed control can be gauged from their access to, and use of, tools and equipment. For example, the most commonly used items by nearly two thirds of residents were the spray pack, and a third used both a ride-on-mower and various garden hand tools. This correlates with the previously noted, physically intense, most favoured methods of weed management. Lesser numbers of other tools and equipment used including: rotary hoes; chainsaws; scarifiers; mulchers; seeders; whipper snippers and brush cutters; and fencing tools. A minor number of residents also had items of heavy equipment available, including tractors, trailers, slashers, 'kanga' mini-diggers and bobcats, and utilities.

In terms of further access to tools and equipment, it was also noted other hired items included equipment related to earthworks and fencing (e.g. bob cats, backhoes, excavators and posthole diggers), plus slashers, fertiliser spreaders and fencing equipment.

Private contractors were used for property management in the following services: water cartage, fencing, building construction and trade repairs, shearing and crutching, landscaping, dam cleaning, slashing and weed control. Most of those who used a contractor for weed spraying had properties less than five acres in size.

5.3.2 Constraints

Although more than 80% of residents wanted to do more on their properties, they acknowledged that they were constrained largely through a lack of time (as previously noted). A lack of money, knowledge and equipment were also noted. Other limiting factors noted by a small minority of residents included a lack of labour resources, a lack of suitable contractors, and the lack of a coordinated approach across their district.

5.4 Rural Lifestyle Landowner Networks

RQ 5: Do rural lifestylers have well-developed networks that can be utilised to inform and disseminate important NRM information and messages on weeds through their peri-urban communities?

Future attempts to engage rural lifestyle landowners and to disseminate NRM and weed information to this group of peri-urban residents will need to utilise their existing and developing networks. The group with potential to provide this effective network appears to be Landcare – one fifth of residents were members at the time of the study, and a further quarter indicated that they would consider joining. It was previously noted that Landcare was a major source of information that led to a perceived improvement in NRM knowledge for many residents. Equally, however, it is important to note the primary reasons for not joining Landcare were a lack of time due to work, commuting and family duties. Local (small 'p') politics also was cited as a reason for not joining, including a perceived focus of Landcare on traditional farming.

However, rural lifestyle landowners have a vastly different range of personal interests, priorities and leisure activities to traditional rural landowners, who have been the focus of past NRM initiatives. In addition to Landcare, rural lifestyle landowners should also be engaged through their particular networks. For Murrumbateman and Wamboin, these could include a range of local social networks that revolve around rural lifestyle landowners' primary leisure activities and the reasons for them selecting their peri-urban location. They typically revolve around animals especially horses, dogs and other domestic animals, as well as gardening. It was previously noted that residents belonged to a large number of community organisations – many associated with their equine interests. Others were associated with the sporting interests for themselves and their families (a full range of social networks in the case study areas was identified in sections 3.2.6 and 3.3.6).

5.4.1 Options for Engaging Rural Lifestyle Landowners

Residents preferred to receive *free* information on NRM, largely as printed material (factsheets, booklets and newsletters) and through the Internet including E-newsletters. Indeed, it was previously noted that more than three quarters of the residents had an Internet connection, and half were on broadband. Smaller numbers preferred to access NRM information through courses and field trips, community meetings and home visits.

Interestingly, just over half of the residents indicated they were prepared to pay for NRM weed information, largely through courses and field trips, factsheets and booklets, and through home visits. They largely saw their local

council as having the responsibility for the provision of NRM information, and to a lesser degree, Landcare and the government (including the Rural lands protection Board, the Department of Agriculture, Department of Environment and Climate Change, and the catchment management authority). It was also noted that councils needed the support of state agencies. The majority of the three quarters of residents who had not undertaken a short course in NRM said that they would consider doing one in the future.

Future endeavours should include an evaluation of the Yass Valley and Palerang councils' Newcomers Kits, particularly their land management content and other initiatives such as the Yass Valley Council's weeds brochure. This evaluation should, amongst a number of matters, consider their suitability for the immediate tasks identified by this research.

5.5 Summary

In terms of addressing the previously made *assumptions*, the research findings have confirmed that *the majority of rural lifestyle landowners undertake little weed management on their peri-urban properties*, in fact a sizeable number spend no time at all on this task. Those that do, do so in manual and time-consuming ways.

However, it is not the case that *most rural lifestyle landowners have limited skills in identifying environmental weeds,* although it is apparent that most *rural lifestyle landowners have no knowledge of new weeds and as a result pose potential biosecurity risk.* Unfortunately, it would appear that *most rural lifestyle landowners have little knowledge of effective weed management regimes*, such as collective effort.

Whilst *few rural lifestyle landowners are motivated to undertake weed management on their land*, many have displayed a motivation to make more use of their property and to do so in a sustainable and self-sufficient manner. This may be the 'key' to achieving a greater commitment to weed management on these peri-urban properties, i.e. establishing for the rural lifestyle landowners, a link between weed control and a sustainable and self-sufficient property.

That said, it needs to be acknowledged that these same residents are severely challenged in finding the time to undertake weed management because of their work, commuting and family lifestyles. They also need improved ways of accessing the relevant information as well as advice on less time-consuming techniques of weed control.

In view of the demographic and socio-economic backgrounds of these rural lifestyle landowners, it would certainly appear that *most rural lifestyle landowners have financial resources to undertake weed management*, particular in larger measures than previously believed.

Whilst there may be some minor differences related to lifestyle priorities, experiences and financial resources, in general rural lifestyle landholders and farmers have the same motivations and limitations in controlling weeds. They share an over-riding desire to maintain the rural character of their district and to achieve sustainability on their individual properties.

There is definite evidence that providing more information, and more relevant information, to rural lifestyle landowners on weeds will result in a change in behaviour and this will lead to more positive outcomes in terms of property management.

6. Conclusions

It was earlier noted that weed management in peri-urban areas is poorly understood and under-resourced. Control of invasive weeds and the monitoring of new weeds have traditionally focused on large-scale commercial properties. However, within the area of responsibility of the UMCCC, there exist extensive areas dominated now by smaller properties that are owned by ‘rural lifestyle’ landowners rather than traditional farmers

Within these areas there has been a dearth of information on the level of weed management undertaken by these landowners of smaller properties. Peri-urbanisation processes continue, particularly in areas in close proximity to major urban centres, including Canberra. Peri-urban landowners, especially rural lifestyle landowners, have a significant impact on these landscapes and have the potential to play a more significant role in management of natural resources, which includes the control of weeds.

This project has sought to better understand the demographic attributes, the priorities and the levels of motivation and resources of rural lifestyle landowners to help determine the barriers that exist to behaviour change in weed management and, therefore, opportunities for the successful engagement of these new land managers.

In addressing the research questions that were designed to inform future engagement of rural lifestyle landowners on weed management issues, the project has identified that the key factors revolve around the issues of time available, NRM (weed) knowledge, and the need for a collective approach to weed management.

In essence, time is the crucial factor. This involves time to undertake essential property management tasks, in particular weed control, and time to gain the necessary knowledge of NRM and weed management. The time required to undertake property management planning, and potentially cross-property planning, is also important for sustainable property management. Clearly, rural lifestyle landowners have to balance their property management responsibilities against the time required to commute to work, their work commitments, and a host of family commitments and other social and recreational choices. Although time management is the key to this dilemma, prioritisation of property management is essential if weeds are to be effectively managed. This can be achieved only if there is awareness of the problem and motivation and capacity (including resources) to do what is necessary. The research findings provide important considerations to address these matters.

On the whole, rural lifestyle landowners have the financial resources and, in many cases, the motivation to potentially become more active in weed

management. Importantly, the crucial and continuing time balancing requirement of rural lifestyle landowners must be taken into account in any future engagement and development of NRM (including weed) knowledge and engagement products.

While there is already use of contractors for a range of property management tasks including weed control, opportunities exist to increase this approach to weed management, particularly in view of the findings in relation to rural lifestyle landowners' resources availability, motivation and lack of time. Hence, contractors' availability, capacity and capabilities also need to be addressed in any future weed management strategy.

The research also indicates an emergent and potentially fuller role for Landcare disseminating property management and weed control guidance, advice and demonstration. These initiatives may be supplemented through greater use of the Yass Valley and Palerang councils' Newcomers Kits, subject to positive outcomes from their evaluations.

On the whole, the research findings suggest that there are major barriers to overcome if weed management is approached on an individual property basis only and consequently, such an approach is highly problematic. It is apparent that weed control needs to be addressed on a whole-community basis.

In this manner, individual property owners could become more fully engaged, particularly if they have confidence that their individual efforts will be complemented by those of their neighbours and especially by those of public land managers. Collective efforts that include neighbours could go a long way to address the local frustrations and annoyances (weed infestation and straying dogs) commonly reported by residents as impacting on their current lifestyles. Residents need to be assured that their efforts will be making a contribution to the overall improvements in their district and community as a whole. Whole-of-community weed management strategies could be developed with the express intent to maintain the rural character of these districts, thus allowing residents to fulfil their desired 'rural lifestyle' – the primary motivator and driver behind their original decision to move to and now to stay in these peri-urban areas. Such strategies, if implemented have the potential to impact on weeds far more effectively than spasmodic action by individual landholders — whether 'rural lifestyle' or primary producers.

Appendices

Appendix 1

Case Study Questionnaire Survey Objectives

Objectives

a) To establish the **background and defining attributes** of 'rural lifestyle landowners' who form a major component of the contemporary peri-urban landscape managers from the Upper Murrumbidgee Catchment

b) To determine 'rural lifestyle landowners' levels of **awareness and knowledge** of NRM

c) To determine the **attitudes, motivation and capacity** of 'rural lifestyle landowners' to undertake their landscape and weed management responsibilities

d) To establish **current levels of management** for NRM

e) To identify optimum approaches to **engage** 'rural lifestyle landowners' on weed management and to **disseminate** NRM information amongst this group

f) To ascertain the degree of **conflict** between 'rural lifestyle landowners' and other peri-urban landscape managers (including traditional farmers)

Follow-up Points for Questionnaire Survey

1. Background of 'rural lifestyle landowners'

- Origins (residential location immediately prior to relocation to current address)
- Reasons/s for relocation to current location
- Details of family unit (adults, children, other dependents)
- Animals – normally on property (including domestic pets)
- Tenure details (owners, purchasers, lessees, renters, carers)
- Permanent or part-time residency (weekender, absentee owner)
- Length of time on current property
- Principals reasons for selecting this property

- Reliance on income generated from activities undertaken on this property
- Future intentions for this property
- Future residential intentions (part of family lifecycle, temporary, permanent)

2. **Defining personal attributes of 'rural lifestyle landowners' (base on principal householder)**
    - Age
    - Current or past occupation (full time, part time, casual, retired)
    - Industry of employment
    - Highest academic qualification
    - Average leisure time available (hours per week)
    - Principal recreational activities (self and family)
    - Current local and regional networks (work related, recreation, children activities, social, other) – include membership to community organisations (including Landcare)
    - Commuting details (reasons for commuting, usual destinations [employment, education, shopping, health, recreation, social, religion, etc], frequency of commuting)
3. **Awareness and knowledge of NRM**
    - Past rural living experience
    - Past property management experience
    - Understanding of what NRM entails
    - Current source/s of property management information (does it include NRM information?)
    - Current source/s of direct NRM information (including online)
    - Prior knowledge of NRM before acquiring current property
    - Property management and NRM information conveyed by real estate agents on acquiring current property
    - Knowledge of potential NRM sources

- Awareness of potential sources for practical and financial NRM assistance

4. Attitudes and motivation of ‘rural lifestyle landowners’

- Concerns for environment care generally and views about NRM and weed priorities
- View/s on responsibility for weed management in this location (individual property owner, council, state NRM agency, catchment group etc)
- Perception of weed problem for this location/district
- Priority of onsite NRM undertakings in relation to other property management requirements
- Value placed on a ‘good-looking’ property
- Attitudes to weeds (including concern for specific weed species in the general location and on their property)

5. Capacity of ‘rural lifestyle landowners’ to undertake NRM

- Special NRM training undertaken (formal courses, workshops, field days etc)
- Spare time available for property management
- Future intention to acquire NRM capabilities

6. Current levels of management for NRM

- Average time (hours per week) devoted to property management
- Major NRM challenges on this property
- Resources (including plant and equipment) available to support NRM on this property
- Use of contractors for property management (including NRM tasks) – for example, solid waste disposal, landscapers, water carters, weed contractors etc

7. Mechanisms to engage ‘rural lifestyle landowners’ (including NRM dissemination options

- Preferences for acquiring NRM information and remaining up to date

- Preferred form of NRM information
- Likelihood of purchasing NRM information (including weeds)
- Perception of responsibility for disseminating NRM information (including weeds)
- Preference for engagement on NRM matters
- Likelihood of their membership to a local group centred on improved property management (including reasons and factors against)
- Incentives to encourage and improve NRM on individual properties

8. Conflict between ‘rural lifestyle landowners’ and traditional farmers

- List current annoyances and frustrations in living in this location (including those associated with farming practices in this location)
- Complaints made against annoyances
- Conflict resolution experienced
- Expected role and responsibility of council in conflict management

9. Control questions

- Size of this property
- Adequacy of current property for their current requirements (size, location biophysical attributes)
- Primary (and secondary) use of property
- Improvements made/introduced since acquiring property
- Number and type of buildings (main dwelling, sheds, other buildings)
- Services to property (for example, postal deliveries, solid waste pick-up)
- Length and surface of property access driveway
- Source/s of power
- Main domestic water supply source
- Number (and size) of farm dams
- Communication details (Internet, broadband, mobile phone coverage)

- Main methods of moving livestock
- Number of horse float or trailers on property
- Source of imported stock fodder

Appendix 2

Project Reference Group

Lynton Bond	Molonglo Catchment Group Chair; peri-urban landowner; UMCCC Treasurer, ACT Representative, Australian Landcare Council
Rowan McKay	Urban Planner, Yass Valley Council
Luke Pope	District Agronomist, NSW DPI
Neville Plumb	Weeds Officer, Palerang Council
Geoff Butler	Consultant, botanist and weed specialist; Peri-urban landowner in study area; Member of Wamboin/Gearys Gap Landcare Group
Simon Katz	Rural Programs Coordinator, ACT Government; Rural landholder in ACT
Geoff Price	Weeds Coordinator, ACT Government

Appendix 3

Historical Survey of the Case Study Areas

Report prepared by: Sandra Harding, Research Assistant, UMCCC Inc.
February 2008

Murrumbateman

Murrumbateman is a village 30 minutes north of Canberra. The village is rapidly expanding, with many people being attracted from nearby cities looking for a relaxed country lifestyle. The Murrumbateman village has a pub with a motel, post office, general store with garage, butchery, take-away and a handful of retail outlets. There are also several cool climate wineries in the district.

Murrumbateman was historically based on wool and beef cattle but has recently emerged as a centre for wine and tourism with wineries, cafes and restaurants, award-winning bed and breakfasts, and other attractions. The village and surrounding district is made up of a diverse and active community, with many local groups and events.

Murrumbateman is believed to have been settled in approximately 1826 with the establishment of 'Murrumbateman' Station, followed in 1850 by more squatters building basic bark huts or slab homes. By 1861, a large proportion of the land in the Murrumbateman district was already held by squatters, leaving small pockets of fertile land and less productive land in the more rocky areas of the district. With the introduction of the *Free Selectors Act of 1861*, Queanbeyan records show 104 transactions giving 8036 acres in the County of Murray, many in the Murrumbateman district. From 1860 to 1930, 'mini-gold rushes' were experienced in the Murrumbateman district, depleting its manpower, but bringing increased traffic of gold seekers and related fortune hunters through the district, and several small acre claims were registered.

Population statistics from the 1881 Census show that there were 14 males and three females living in the village, and 543 males and 443 females lived in the south-east quadrant from the village. Census data covering the next 80 years are important as they indicate a long period of stability, in contrast with the expansion of the subsequent twenty years.

Statistics for the years 1901, 1911, 1921, 1947 and 1954 show:

Statistics	***1901***	***1911***	***1921***	***1947***	***1954***
Occupied Dwellings	-	38	33	41	52
Males	51	104	91	92	114
Females	41	94	82	78	99
Total	92	198	173	170	213

It was estimated that, in 1965, approximately 260 to 280 people resided in the village; and in 1987 village population was 750 persons, with 450 living within a 10-kilometre radius. In 1987, it was estimated 1200 to 1500 people were residing with a 10-kilometre radius of Murrumbateman. Seventy-three per cent of these had moved there from Canberra. Subdivisions have replaced broadacre grazing in more than one-third of the landscape.

Although small acreages had been planted with vines in the 1800s, drought had played a significant part in these ventures petering out. Planting of grapes for wine started in 1971. In 1979 the Canberra District Vignerons' Association was established with 25 members. By 1995, the Yass Show exhibited 73 wines from 14 district wineries.

In 1966 the first subdivision was approved for 40 acres blocks. In 1969 Council resolved to increase the minimum size of blocks from 40 acres to 500 acres and to provide for special zones where small lots could be created.

(Reference: Dorothy Mulholland, 1995: *Far Away Days: A History of the Murrumbateman, Jeir and Nanima districts.*)

Wamboin

Wamboin is a small rural community in New South Wales in Palerang Council Area. It is approximately 20 kilometres northeast of Canberra and comprises more than 2000 residents who live on properties ranging from 5 to 40 acres in size. Wamboin has its own church, community association, community halls, newsletter, volunteer bushfire brigade, pony club, cub and scout groups, a farmers' market and, more recently, a women's group. A number of small businesses operate nationally and internationally from addresses in the area. The Wamboin area has an Anglican community centred on St Andrew's Church, which attracts people from surrounding communities. It was first established in 1985, as an adjunct to St. John's Church, Canberra, and early services were held in the local community hall.

The name Wamboin (Womboyne, Wamboin) was originally derived from the Didawall Aboriginal word for 'large grey kangaroo', although history does not relate why this name was chosen. There has been little research done

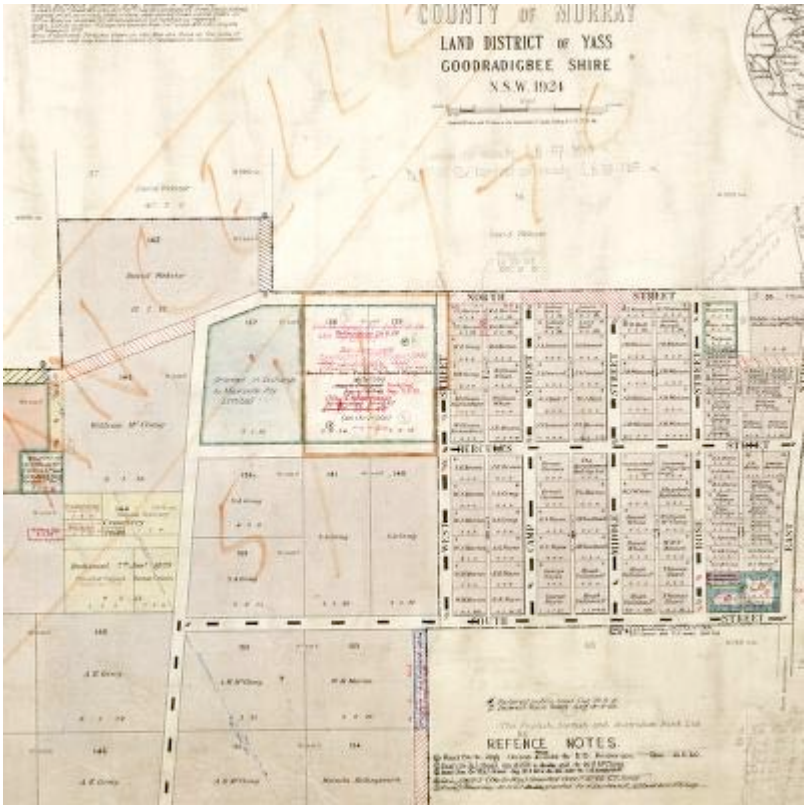
regarding the Wamboin Parish, and very little is known regarding its historical background.

Research of historical maps and early publications at the National Library of Australia revealed that there is no reference to Wamboin in their 1880 New South Wales Gazetteer, and the only pastoral station referenced in the area in the *Atlas of NSW Pastoral Stations 2004*, researched from early records, by Terence & Rosemary Alick, is 'Alira' (though no settlement as such is recorded). Early squatters' records for New South Wales record no inhabitants in Wamboin, and maps dated 1906 show no settlement in the area.

Mine records in the New South Wales State Archives record mining under 'Wamboin Kaolin deposit, Bungendore area' as commencing 1875. Maps from 1895 indicate gold veins and diggings in the area from Bywong to Gundaroo, with a few in the Wamboin area, a small village, Newington, near the current Newington Road, sprang up in 1865 for a short time to service a small gold deposit (Mac's Reef). The report in 1897 noted that the lack of water could account for the decline in the mining industry in the area. The gold fields shown within close proximity of Wamboin may have influenced some settlement in the area. A few land applications were made under the Torrens Title Act of 1863 and are lodged with NSW State Archives.

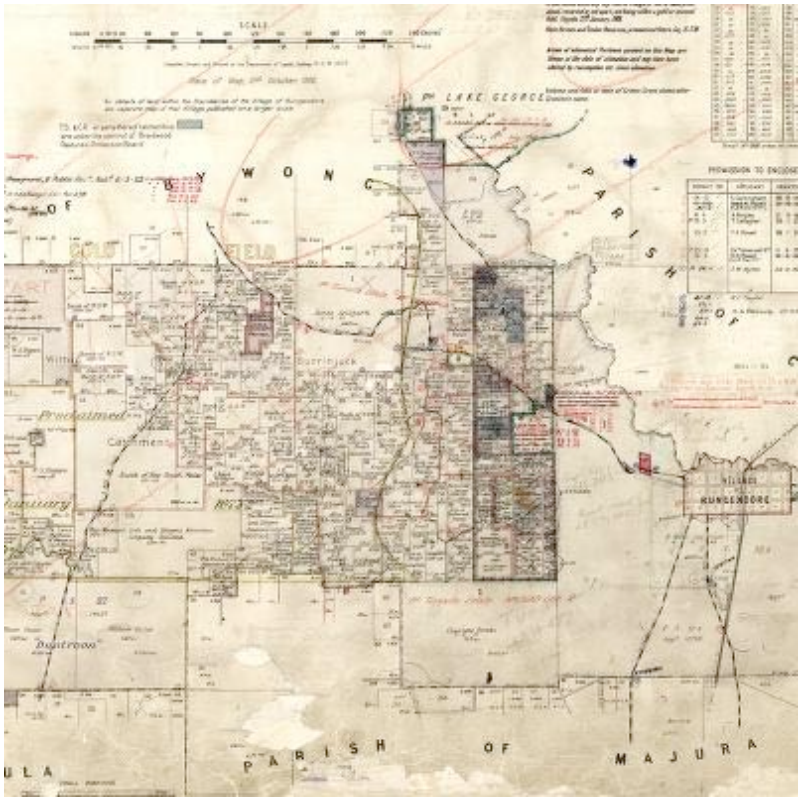
Maps dated 1926 reveal a relatively sudden increase in settlement in Wamboin, thought to be a result of post World War I soldier settlement blocks. The land in Wamboin has been described as poor and not suitable for agriculture and grazing, therefore soldier settlement blocks may have been allocated as a form of compensation for returned servicemen, though not necessarily taken up. Block sizes ranged from approximately 10 acres up to 40 acres or more. A large number of smaller blocks are distinctly marked in a rectangular area all bordering each other in the same vicinity (see map attached). It is thought these made up the majority of the soldier settlement blocks, but further historic research would need to be undertaken to verify this. By 1927, Wamboin maps identified a large area of small holdings to the east (near Bungendore) and the west (near Canberra) with larger properties being concentrated in the central portion of Wamboin. This is felt to be due to these areas being closer to major centres, making services more accessible.

Mr. John Wright, Strategic Planner, Palerang Council, advised that prior to 1964, no planning control was in place, resulting in *ad hoc* portion subdivision. With the introduction of the NSW State Interim Development Order in 1964, subdivision was limited to 50 acres, and the first Rural Residential Zone application was approved by council in 1973.



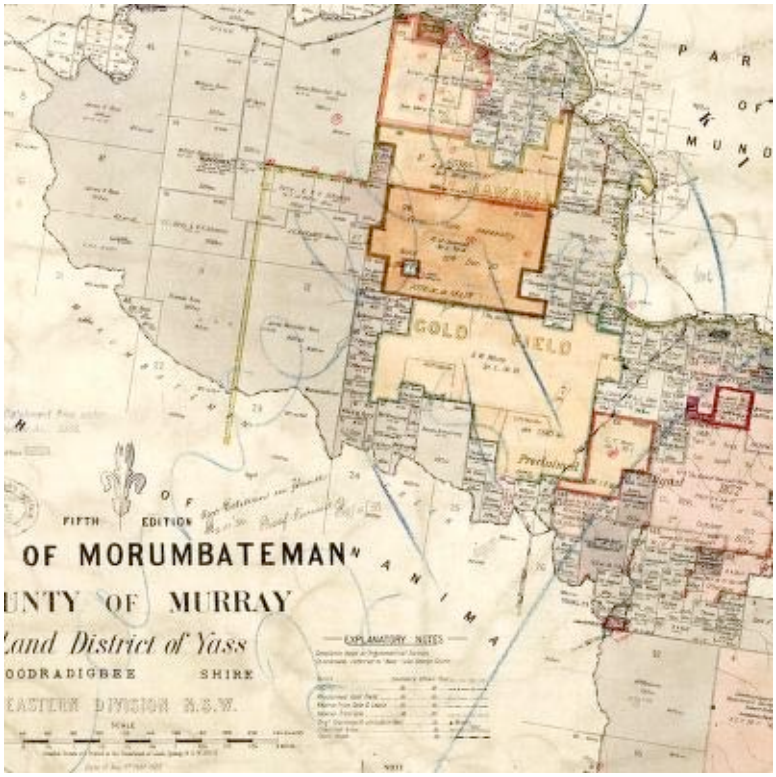
Department of Lands, Parish Map Preservation Project

Murrumbateman Town, County of Murray, 1924



Department of Lands, Parish Map Preservation Project

Murrumbateman, County of Murray, 1924



Department of Lands, Parish Map Preservation Project

Wamboin, NSW 1925

References:

The Atlas of NSW Pastoral Stations 2004, researched from early records, by Terence & Rosemary Alick

Department of Lands, Parish Map Preservation Project, <*http://parishmaps.lands.nsw.gov.au/pmap*>

Far away days: a history of the Murrumbateman, Jeir and Nanima Districts, Dorothy Mulholland, Murrumbateman Old School Grounds Committee, 1995.

Murrumbateman Progress Association, Murrumbateman, NSW 2582, <http://www.murrumbateman.org.au>

National Library of Australia, Mapping Records – personal visit

NSW Gazetteer 1880.

State Records NSW <http://www.records.nsw.gov.au/archives/>

Wikipedia – The Free Encyclopedia http://en.wikipedia.org/wiki/Bungendore, New South Wales

Appendix 4

Demographics of Murrumbateman

Age	Males	Females	**Total**
Age (years):			
0-4 years	*85*	*81*	***166***
5-9 years	*94*	*90*	***184***
10-14 years	*105*	*90*	***195***
15-19 years	*69*	*82*	***151***
20-24 years	*40*	*38*	***78***
25-29 years	*32*	*42*	***74***
30-34 years	*57*	*76*	***133***
35-39 years	*85*	*107*	***192***
40-44 years	*88*	*82*	***170***
45-49 years	*111*	*97*	***208***
50-54 years	*95*	*93*	***188***
55-59 years	*89*	*83*	***172***
60-64 years	*54*	*43*	***97***
65-69 years	*30*	*31*	***61***
70-74 years	*14*	*21*	***35***
75-79 years	*20*	*0*	***20***
80-84 years	6	7	**13**
85-89 years	0	7	**7**
90-94 years	0	0	**0**
Total	**1,074**	**1,070**	**2,144**

Demographic summary	Males	Females	**Total**
Labour force status:			
Employed, worked full-time	501	293	**794**
Employed, worked part-time	89	234	**323**
Employed, away from work	26	40	**66**
Unemployed, looking for work	11	12	**23**
Total labour force	***627***	***579***	***1,206***
Not in the labour force	120	196	**316**
% Unemployment	1.8	2.1	**1.9**
% Labour force participation	79.6	71.5	**75.5**
% Employment to population	78.2	70.0	**74.0**
Non-school qualifications:			
Postgraduate Degree	52	45	**97**
Graduate Diploma and Graduate Certificate	24	33	**57**
Bachelor Degree	123	138	**261**
Advanced Diploma and Diploma	71	80	**151**

Demographic summary	Males	Females	**Total**
Certificate Level	194	90	**284**

Indigenous	Males	Females	**Total**
Total	**11**	**0**	**11**

Country of Birth	Males	Females	**Total**
Australia	841	867	**1,708**
Overseas	232	205	**437**

Gross individual weekly income	Males	Females	**Total**
<$400	145	293	**483**
$400-$599	81	104	**185**
$600-$799	70	76	**146**
$800-$999	78	87	**165**
$1,000-$1,299	96	90	**186**
$1,300-$1,599	86	59	**145**
$1,600-$1,999	73	39	**112**
$2,000 or more	108	20	**128**

Household Income	Family house-holds	Non Family house-holds	**Total**
< $500	18	21	**39**
$500-$649	15	7	**22**
$650-$799	9	9	**18**
$800-$999	27	10	**37**
$1,000-$1,199	44	15	**59**
$1,200-$1,399	33	0	**33**
$1,400-$1,699	58	12	**70**
$1,700-$1,999	44	3	**47**
$2,000-$2,499	82	0	**82**
$2,500 -$2,999	81	8	**89**
$3,000 or more	107	3	**110**

Number of motor vehicles per dwelling	Dwelling number
None	7
1 motor vehicle	106
2 motor vehicles	341
3 motor vehicles	122
4 or more motor vehicles	78
Total	***654***

Method of travel to work	Males	Females	**Total**
Bus	8	12	**20**
Car, as driver	434	333	**767**
Car, as passenger	24	67	**91**
Truck	17	0	**17**
Motorbike/scooter	6	3	**9**
Bicycle	3	0	**3**
Other	3	3	**6**
Walked only	16	5	**21**
Total	***515***	***423***	***938***
Worked at home	42	43	**85**
Did not go to work	47	90	**137**

Household structure (No. persons usually resident:	Family house-hold	Non Family house-hold	**Total**
One	..	75	**75**
Two	212	17	**229**
Three	111	0	**111**
Four	151	0	**151**
Five	74	0	**74**
Six or more	29	0	**29**
Total	**577**	**92**	**669**

Dwelling structure	Dwellings	Persons
Separate house	653	1,971
Semi-detached		
One storey	6	21
Two or more storeys	3	4
Total	***9***	***25***
Other dwelling:		
Caravan, cabin, houseboat	4	13
Improvised home, tent, sleepers out	3	8
House or flat attached to a shop, office, etc.	0	0
Total other structures	***7***	***21***

Tenure Type	Dwelling number
Fully owned	200
Being purchased	402
Rented:	
Real estate agent	19
Person not in same household	27
Other landlord type	5
Landlord type not stated	4
Total rented	***55***

Movement into the area	Place of residence	
	1 year ago	5 years ago
Same usual address 1 or 5 years ago as in 2006	1,707	974
Different usual address 1 or 5 year ago:		
Same Statistical Local Area (SLA)	44	80
Different SLA	238	768

Demographics of Wamboin

Age	Males	Females	**Total**
Age (years):			
0-4 years	55	61	116
5-9 years	64	59	123
10-14 years	63	109	172
15-19 years	79	97	176
20-24 years	35	40	75
25-29 years	25	25	50
30-34 years	49	57	106
35-39 years	58	75	133
40-44 years	84	96	180
45-49 years	102	111	213
50-54 years	104	96	200
55-59 years	90	95	185
60-64 years	64	58	122
65-69 years	35	32	67
70-74 years	18	13	31
75-79 years	10	10	20
80-84 years	4	4	8
85-89 years	0	0	0
90-94 years	0	3	3
Total	**939**	**1,041**	**1,980**

Demographic summary	Males	Females	**Total**
Labour force status:			
Employed, worked full-time	436	279	715
Employed, worked part-time	88	226	314
Employed, away from work	37	41	78
Unemployed, looking for work	9	12	21
Total labour force	***570***	***558***	***1,128***
Not in the labour force	137	204	341
% Unemployment			
% Labour force participation	1.6	2.2	1.9
% Employment to population	75.4	69.1	72.1
Non-school qualifications:			
Postgraduate Degree	76	51	127
Graduate Diploma and Graduate Certificate	32	49	81
Bachelor Degree	150	177	327
Advanced Diploma and Diploma	65	89	154
Certificate Level	141	77	218
Indigenous	Males	Females	Total
Total	**16**	**6**	**22**

Country of Birth	Males	Females	**Total**
Australia	713	783	1,496
Overseas	208	257	465

Gross individual weekly income	Males	Females	**Total**
<$400	134	255	389
$400-$599	57	104	161
$600-$799	65	74	139
$800-$999	54	73	127
$1,000-$1,299	108	94	202
$1,300-$1,599	81	68	149
$1,600-$1,999	73	40	113
$2,000 or more	125	42	167

Household Income	Family households	Non Family households	**Total**
< $500	12	8	20
$500-$649	13	11	24
$650-$799	10	11	21
$800-$999	15	9	24
$1,000-$1,199	38	14	52
$1,200-$1,399	28	0	28
$1,400-$1,699	34	9	43
$1,700-$1,999	36	3	39
$2,000-$2,499	80	0	80
$2,500 -$2,999	82	4	86
$3,000 or more	131	0	131

Number of motor vehicles per dwelling	Dwelling number
None	0
1 motor vehicle	90
2 motor vehicles	312
3 motor vehicles	141
4 or more motor vehicles	78
Total	***621***

Method of travel to work	Males	Females	**Total**
Bus	0	3	3
Car, as driver	387	348	735
Car, as passenger	29	53	82
Truck	19	4	23
Motorbike/scooter	4	0	4
Bicycle	5	0	5
Other	0	0	0
Walked only	15	8	23
Total	***466***	***416***	***882***
Worked at home	24	35	59
Did not go to work	51	86	137

Household structure	Family household	Non Family household	Total
Number of persons usually resident:			
One	..	70	70
Two	226	7	233
Three	114	0	114
Four	138	0	138
Five	50	0	50
Six or more	26	0	26
Total	**554**	**77**	**631**

Dwelling structure	Dwellings	Persons
Separate house	602	1,743
Semi-detached		
One storey	0	0
Two or more storeys	0	0
Total	*0*	*0*
Other dwelling:		
Caravan, cabin, houseboat	10	20
Improvised home, tent, sleepers out	7	19
House or flat attached to a shop, office, etc.	5	16
Total other structures	***22***	***55***

Tenure Type	Dwelling number
Fully owned	234
Being purchased	340
Rented:	
Real estate agent	14
Person not in same household	0
Other landlord type	29
Landlord type not stated	6
Total rented	**49**

Movement into the area	Place of residence 1 year ago	Place of residence 5 years ago
Same usual address 1 or 5 years ago as in 2006	1,651	1,116
Different usual address 1 or 5 year ago:		
Same Statistical Local Area (SLA)	16	45
Different SLA	*134*	*525*

Appendix 5

Waste Disposal and Mail Services – Murrumbateman (Yass Valley Council) and Wamboin (Palerang Council)

Murrumbateman

Yass Valley Council, 209 Comur Street, Yass, NSW 2582

Waste Transfer

Garbage collection is done by Yass Valley Council for the Murrumbateman village and surrounds.

Areas serviced are: Village confines, Ambleside Estate, Dundoos Estate, Merryville Estate, Merryville Park, Barton Highway to 'Barton Downs' in the south and the 60-kilometre speed-limit sign in the north, Euroka Avenue.

Murrumbateman has its own tip managed by Yass Valley Council

Mail

Australia Post: Murrumbateman Post Office, 22 East Street, Murrumbateman, NSW 2582

Australia Post: Yass Post Office, 95 Comur Street, Yass, NSW 2582

Murrumbateman Post Office services post office boxes and pigeon holes inside the post office only. A total of 390 households have mail delivered in this manner.

All other mail is delivered by a contractor from Yass Post Office. Mail Delivery run follows a route from Murrumbateman Village along the Barton Highway to Mundays Lane south, Dog Trap Road to the west, village limits north and along Murrumbateman Road to Boutchers Drive east.

Areas serviced include: Dundoos Drive, Davis Ct, Linden Road, Elrington Close, Broughton Ct, Ambleside Ave, 3 cluster boxes at Glengyle Rd, Dicks Creek Road, 11 cluster boxes at Mountainvale Rd/John Jobbins Dr, 10 cluster boxes down Boutchers Drive, Nanima Rd to Glencoe Road, Bushs Lane, Patemans Lane, Turton Place, Euroka Avenue, Vallencia Drive, 13 Gooda Creek Rd cluster boxes and 6 Mundays Lane cluster boxes, 3 Casuarina Lane cluster boxes, to the east of the Barton Highway, Merryville Drive, Acacia Way, Scrubby Lane, Isabel Drive, Woods Close, and all avenues/places thereon to the west of the Barton Highway.

Mail is delivered 3 days per week.

Wamboin

Palerang Council, 4 Majara Street, Bungendore, NSW 2620

Waste Transfer

No garbage collection is done by council in the Wamboin area.

Private contractor: O'Sullivan's Rural Waste (David O'Sullivan)

Garbage collection of all types is made on a needs basis. Garbage is place in a 240-litre bin (supplied by O'Sullivan's Rural Waste) and collected when required. Cost is $7 per collection and approximately 300 households, covering all streets of Wamboin, are serviced.

O'Sullivan's Rural Waste is the only garbage collection service being carried out in the Wamboin area and covers surrounding districts.

A tip is located within the area, on Macs Reef Road. Bungendore also has a tip. Both are managed by Palerang Council.

Mail

Australia Post, Queanbeyan Mail Delivery Centre

Mail Delivery run follows route from Sutton Road along Norton Road to:

Gallagher Road, Proud Place, Coopers Road, Campbell Place, Furnloff Road, Finn Place, Robertson Place, Poppet Road, Canning Close, Amingla Place, Bingley Way, Merino Vale Road, Ryans Road, Valley View Lane, Clare Valley Place, Weeroona Drive, Reedy Creek Place, Majors Place, Woolshed Road, Denley Drive, Birchman Grove, Kestral Place, Hogan Drive, Wirreanda Drive. Beyond this point mail is delivered from Bungendore via Bywong.

Mail is delivered five days per week. Mail is delivered to individual households except for one case of cluster boxes at the end of one lane.

A total of 524 households in the area have mail delivered from Queanbeyan.

Appendix 6

Weed Identification Test Methodology

Method description

A weed identification test was included in the survey questionnaire in an attempt to determine the knowledge level respondents had of environmental weeds. The environmental weeds chosen for the identification test were determined through consultation with the project reference group, which included botanical experts and council weed officers. The five weeds chosen were considered the most common and high priority weeds found in both case study locations.

To add complexity to the test, three extra images of native non-invasive plants were included in the test. The purpose of these images was to try and control against respondents guessing the answers and selecting all images as weeds. The native species chosen for the test were specifically chosen as they are species that look similar, but are still distinct, from common environmental weeds. Council weed officers and Landcare representative of the project reference group identified that there is a high risk of vulnerable and protected native species, such as these, being mistakenly poisoned by peri-urban landholders.

Photos were used as an easy and quick identification method (see attached Weed Test sheet). The photos chosen were close up images showing distinct characteristics such as flowers and fruit. The paddock scale image of serrated tussock was chosen to show the distinct growth and spread pattern of the weed.

Methodology Limitations

The weed identification test was limited in its success due to the unclear nature of the question. Because the question was posed as '*Which of the following photos are of agricultural/environmental weeds?* (tick any)'. It was assumed that the images the respondent did not tick were known to be natives. This assumption is potentially misleading. It is possible that some respondents who did not tick the natives did not recognise the plant at all, rather than recognising it as a native species.

The results can therefore not be used to judge respondents' knowledge of native plant species. However, if a respondent did not identify the native species as a weed it can be assumed that the respondent would also not treat this species as a weed. This data can therefore be used with some confidence to judge the percentage of respondents who are at risk of poisoning native species in mistake for weeds.

References

Buxton M, Tieman G, Bekessy S, Budge T, Mercer D, Coote M and Morcombe J (2006) *Change and Continuity in Peri-urban Australia: State of the Peri-urban Regions – A Review of the Literature*, Monograph 1 - Change and Continuity in Peri-Urban Australia, RMIT University.

Buxton M and Low Choy DC (2007) *Change in Peri-urban Australia: Implications for Land Use Policies*. Paper to 3rd State of Australian Cities Conference, Adelaide, 28–30 November 2007.

Low Choy D, Sutherland C, Gleeson B, Sipe N and Dodson J (2008) *Change and Continuity in Peri-Urban Australia: Peri-Urban Futures and Sustainable Development*, Monograph 4, Urban Research Program**,** Griffith University, Brisbane.

Low Choy DC, Sutherland C, Scott S, Rolley K, Gleeson B, Dodson J and Sipe N (2007) *Change and Continuity in Peri-urban Australia – Peri-urban Case Study: South East Queensland*, Monograph No 3. Urban Research Program, Griffith University, Brisbane.

Mulholland D (1995) *Far Away Days: A History of the Murrumbateman, Jeir and Nanima districts*, Murrumbateman Old School Grounds Committee.

Australian Bureau of Statistics, 2006 Census of Population and Housing.