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## Strengthening biodiversity: Examining volunteer engagement in local government community nurseries

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# **Strengthening biodiversity: Examining volunteer engagement in local government community nurseries**

A thesis submitted in partial fulfilment of the requirements  
for the award of the degree

**Master of Environmental Science (Research)**

**from**

**UNIVERSITY OF WOLLONGONG**

**By**

**Paul W. Marshall**

**School of Geography and Sustainable Communities**

**2017**

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## **Abstract**

Conservation volunteering has grown to become a vital component in national efforts to reduce the serious decline in biodiversity around the world and research has focused on documenting and evaluating its nature and extent, along with the barriers, limitations and motivations of conservation volunteers. Although academic research has examined aspects of this 'movement' and the volunteers who comprise it, various gaps remain. One of these is the role of the community nurseries which grow and supply a diverse range of local provenance native plants for use in revegetation and landscape rehabilitation, including enhancement of Endangered Ecological Communities. The establishment of community nurseries by local government authorities (LGAs) coincided with a legislative broadening of LGA responsibilities from compliance and enforcement roles to include expanded natural resource management and sustainability roles.

The case study research focussed on three LGA community nurseries; covering an urban, a peri-urban and a rural/regional context. The case study research used a survey and interviews to profile the community nursery volunteers and their motivations, volunteer contributions, barriers to volunteering, and their satisfaction with their volunteer experience in the community nursery. The research found that the community nursery volunteers represent an environmentally-aware, civic-minded, dedicated cohort; one that is comprised of active, older, retired or semi-retired, socially-engaged people with a significantly higher proportion being female. A high proportion also volunteer with Bushcare, Landcare and non-NRM groups, demonstrating strong social engagement.

Their motivations for volunteering in the community nursery are primarily to help conserve biodiversity. Another key motivation was enjoyment of the social aspects with volunteers expressing how the community nursery brings people together, gives them a sense of belonging and fosters community spirit. A high percentage of community nursery volunteers found the experience more satisfying, or much more satisfying, than other places where they volunteer. This is significant in that Australia has an aging population and keeping older people engaged in the community is as good for their own health and wellbeing as it is for the maintenance of a vibrant civil society.



## **Acknowledgements**

In the first instance I would like to acknowledge my family for the support and encouragement they have given me to undertake this thesis research. In particular my wife Virginia has encouraged me to focus on the value of this research to supporting and encouraging the community natural resource management sector and the volunteers who are its lifeblood. Also my father, who spent many years encouraging me to undertake a Master's degree, and my mother for her undying faith in me.

I wish to thank all the community nursery volunteers who were willing to provide a candid assessment of the strengths and weaknesses of their community nursery and insights into their motivations for volunteering. I also thank the community nursery coordinators who agreed to be interviewed for this research and the local government environment branch managers who provided insights into the policy drivers behind the establishment of their community nursery.

This research has been conducted with the support of the Australian Government Research Training Program Scholarship. I would not have been able to complete the research without this support.

I am particularly grateful to my supervisors, Professor Lesley Head and Associate Professor Nicholas Gill, who helped me refine my research question, advised on the framing of my questionnaires, guided me through the ethics approval process, provided helpful feedback and guidance on data analysis and the thesis drafts, and were always patient and supportive.

Finally I am grateful to the University of Wollongong HDR office for the opportunity to undertake this research and the support they have provided me to do so.

## **Declaration**

The information in this thesis is entirely the result of investigations conducted by the author, unless otherwise acknowledged, and has not been submitted in part, or otherwise, for any other degree or qualification.

Paul Walter Marshall

15 November 2017

# **1 INTRODUCTION**

## **1.1 Background**

This research focusses on the crucial role that the community can and does play in efforts to reverse biodiversity decline, and in particular focusses on the community volunteers engaged in such work. The evidence suggests (Walsh & Mitchell 2002, World Health Organisation 2005, Natural Resource Management Ministerial Council 2010, Rands et al 2010, Australian State of the Environment Committee 2011, Flannery 2012) that biodiversity both globally and in Australia continues to be in serious decline. Australia's Biodiversity Conservation Strategy 2010–2030 sets out a vision whereby 'all Australians including Indigenous peoples, farmers, land managers, industry, governments and community groups such as Landcare are working together to conserve biodiversity' (Natural Resource Management Ministerial Council 2010, p. 3) and articulates a belief that 'unless the whole community works together to take up the challenge, then we are unlikely to stop the decline in biodiversity' (p. 4) and includes a call to action that asserts 'we must, as a society and as individuals, acknowledge the threat to our biodiversity and act collectively to reverse the decline' (p. 17).

The Strategy refers to the significant role that Indigenous peoples can play in biodiversity conservation, acknowledging that 20% of Australia's land area is under Indigenous management (p. 40); and seeks to more effectively integrate natural resource management into local government operations (p. 60), recognising Local government as a 'valuable and ongoing contributor to efforts to conserve biodiversity through its role in local and regional planning and, increasingly, through its role in environmental management, monitoring and reporting' (p. 69). All Australian states and territories have developed biodiversity conservation strategies of some form (Australian Government 2017) and all seek to engage community volunteers in stemming biodiversity loss, including through grant programs.

The engagement of the community, and the role of community volunteers, has grown to become a vital component in efforts to reduce the serious decline in biodiversity throughout Australia and around the world. Scholarly research has

focused on documenting and evaluating the nature and extent of conservation volunteering, along with the barriers, limitations and motivations of the conservation volunteers. Conservation volunteering encompasses advocacy, research and education, environmental monitoring (including citizen science) as well as threat abatement for endangered species through pest animal and weed control, ecological burning and on-ground revegetation and rehabilitation.

Evidence suggests that the adequacy of the supply of a diverse range of local provenance plants is one of the main barriers to effective implementation of programs and projects aimed at landscape-scale restoration of ecological linkages and protecting and buffering high conservation value remnant vegetation (Australian Government 2011c). In Australia community volunteers play a vital role in the production of local provenance plants for biodiversity conservation programs through Landcare revegetation nurseries, Aboriginal community nurseries and Local Government operated community nurseries.

## **1.2 Thesis aims**

In view of the important role played by community nurseries in growing and supplying local provenance plants for biodiversity conservation and landscape rehabilitation, it is surprising that there is a paucity of research on the people who volunteer within community nurseries. The overall aim of this thesis is to examine the role of community nurseries in strengthening biodiversity conservation and the role of community nursery volunteers in biodiversity conservation, through a case study of three local government community nurseries. This study draws on the perspectives of both the volunteers and those who manage them, and proceeds to generalise from this research to guide and facilitate better engagement, retention and recruitment of volunteers across the community nursery sector.

I examine the case study community nurseries from three perspectives:

1. The perspective of the Council Environment the Branch Managers who have overall responsibility for their performance and budget allocations;
2. The perspective of the Community Nursery Coordinators who have day-to-day operational control of the nurseries and their volunteers; and

3. The perspective of the community nursery volunteers themselves including their demographic characteristics, attitudes, motivations, volunteer experience and the barriers to their continued participation.

Community nurseries could not operate without a core group of volunteers so gaining a better understanding of the motivations, needs and the barriers these volunteers face will assist in attracting, engaging and retaining them into the future, and perhaps also in diversifying the community nursery volunteer base.

There is a growing literature on volunteer engagement in conservation, including volunteer engagement through Landcare, Bushcare, Rivercare, and Coastcare programs in Australia (e.g. Ryan et al 2001, Gooch 2003, Randal & Dolnicar 2006, Youl Marriott & Nabben 2006, Bruyere & Rappe 2007, Curtis et al 2008, Gooch and Warburton 2009, Robins & Kanowski 2011, Buizer, Kurz & Ruthrof 2012, SMCMA 2012, Tennent & Lockie 2012, Rankin 2013, Peters 2015, Randle & Dolicar 2015, Huq & Burgin 2016, Toomey et al 2016), and also on Aboriginal Natural Resource Management through the Aboriginal land and sea ranger programs (e.g. NAILSMA 2012, CAEPR 2012b, Nursey-Bray 2015). However there is very limited scholarly literature on volunteer engagement in local government community nurseries, and very little literature on Landcare revegetation nurseries and Aboriginal community nurseries. While this thesis does touch on Landcare and Aboriginal community nurseries, a detailed examination of these nursery sectors must remain a topic for future study.

The focus of this research is on local government-run community nurseries, and reflects the increasing value and importance of these nurseries in supplying a diverse range of local provenance plants for use in landscape-scale rehabilitation programs. It is likely that community nurseries will continue to play an important role in the production of local provenance plants for landscape restoration / rehabilitation programs, so understanding the drivers behind local government support for them, and the barriers / limitations under which they operate, may also be of value to any local government agency with an interest in establishing a community nursery.

## **2 LITERATURE REVIEW AND BACKGROUND**

This chapter sets the context for the thesis research. Section 2.2 reviews biodiversity loss and why it should be of concern while section 2.3 reviews the importance of engaging all elements of the community in addressing biodiversity loss and the key avenues of community engagement: the Landcare movement, Aboriginal land management programs and local government programs. Section 2.4 reviews the data on volunteering in society in both international and Australian contexts, while section 2.5 reviews the development, character and support structures for conservation volunteering. Section 2.6 reviews the development and character of conservation volunteering through local government, in particular that of Bushcare volunteers; while section 2.7 reviews the literature on the motivations of conservation volunteers and their profiles and characteristics. Section 2.8 focusses on the supply of local provenance plants for biodiversity conservation programs and reviews the three key components of the community nursery sectors; that is, the Landcare revegetation nurseries, Aboriginal community nurseries and local government community nurseries.

Chapter 3 outlines the research methodology, with the results of the research presented in chapters 4-7. Chapter 4 examines the establishment and operation of local government community nurseries, firstly from the perspective of Council Environment Branch managers (section 4.2) and then from the perspective of the nursery coordinators (sections 4.3 & 4.4). Chapter 5 details the results from the community nursery volunteer surveys and telephone interviews and chapter 6 analyses these findings in the context of the published literature. Chapter 7 details the conclusions from the thesis research.

### **2.1 Rationale**

The literature review examines the challenges of addressing biodiversity loss, firstly by examining its extent and significance and then by examining community engagement in biodiversity conservation. Community engagement is acknowledged as crucial to addressing biodiversity loss. In this context the literature review examines volunteering in society, from both an international and then an Australian perspective; the contribution volunteers make to society as a whole and to conservation in particular. It examines conservation

volunteering in New Zealand, within the Australian Landcare sector, through Aboriginal land management initiatives and through the Australian local government sector. These are all central themes in Australia's Biodiversity Conservation Strategy and the state-based strategies, as discussed below. While the management of key threatening processes, such as inappropriate fire regimes, weeds, pest animals, introduced pathogens and land clearing in a landscape context is arguably the primary approach to addressing biodiversity loss, landscape-scale rehabilitation is also important.

The thesis will examine literature on the production of plants for biodiversity conservation; and review the role that Landcare revegetation nurseries, Aboriginal community nurseries and local government community nurseries play in supplying the local provenance plants required. The latter sector, local government community nurseries, is the focus of the thesis research, with the three community nurseries selected for detailed case study providing a basis to compare and contrast volunteer engagement in this important sector, to better understand the characteristics of the community nursery volunteers across the spectrum of community nurseries.

## **2.2 Meeting the challenge of biodiversity loss**

In an effort to address the serious decline in global biodiversity the international community has adopted a range of instruments, Conventions and Declarations, Strategies and Action Plans. These include the Stockholm Declaration (1972), the Rio Declaration (1992) encompassing Agenda 21 and Sustainable Development Goals, the Convention on Biological Diversity (1993) including its Nagoya Protocol and Aichi Biodiversity Target 17, and the Declaration on the Rights of Indigenous Peoples (2007). The Convention on Biological Diversity (CBD) for the first time recognised in international law that the conservation of biodiversity is a common concern of humankind. It has become one of the most widely ratified UN treaties, with 196 treaty Parties. The CBD Aichi Biodiversity Target 17 Article 6 calls on each Party to develop adopt and implement a participatory and effective National Biodiversity Strategy and Action Plan by 2015. As at March 2017 96% of CBD signatories, including Australia, had developed National Biodiversity Strategies and Action Plans (UN CBD Secretariat 2017).

It is reported that Australia has suffered the highest rate of mammal extinction in the world (Walsh & Mitchell 2002). The World Health Organisation (2005), in its Millennium Ecosystem Assessment, warned that some 'ongoing, large-scale human-induced ecosystem changes, such as those involving loss of biodiversity ... are effectively irreversible', and called for collective and coordinated action at all levels of social organization', warning of 'social upheaval associated with ecosystem service failure at the local or regional scale'. In his essay on Australia's new extinction crisis Flannery (2012) comments that efforts aimed at preventing extinctions have been 'generally ineffectual', and expresses dismay at the way conservative state governments are 'rolling back protections for nature'. Flannery is highly critical of the lack of government action, the decline in biodiversity investment, the failure of regulation, and the general public ignorance of this crisis and he asserts that 'such is the depth of public ignorance about Australia's extinction crisis that most people are unaware that it is occurring'. Flannery also points out that many of our regional neighbours are also 'in danger of losing their most distinctive species'.

The Australian continent exhibits very high levels of endemism; for example 91% of our vascular plants are endemic to Australia (Australian State of the Environment Report 2011), earning Australia the tag of a 'megadiverse' country. Like Australia, New Zealand is also a biodiversity hotspot, and one with a severe record of biodiversity loss. Craig et al (2000) report that eight species of endemic plant have been driven to extinction since colonial settlement, and a further 289 species are listed as either threatened or vulnerable. A sobering account of the Australian experience of biodiversity loss was given in the Australian State of the Environment Report 2011:

... the evidence from changes in extent, composition and quality of vegetation communities, and from case studies on selected species, points towards continuing decreases in population sizes, geographic ranges and genetic diversity, and increasing risks of population collapses in substantial proportions of most groups of plants, animals and other forms of life across much of Australia (Ibid, p. 579).



It is estimated that Australia has 17.6% of the world's threatened, rare and poorly known flora (Leigh and Briggs 1992), with nearly 46% occurring in Western Australia. Coates and Atkins (2001) draw attention to the increasing threats to biodiversity in Western Australia, where 72% of the threatened flora populations occur outside the conservation reserve system. Concern for Western Australia's biodiversity values did not emerge as a political priority until the 1990s, and in the prior decade it was the WA government's policy goal to clear a million acres per year of native scrub for grazing and agriculture (Kerin 2017, p. 550). Similarly, CSIRO estimates that 428,100 hectares of land had been cleared in NSW in the 1970s and at least another 112,000 hectares were cleared in the 1980s; which followed extensive clearing of native forest lands from the 1950s to 1970s. Similar extensive land clearing occurred in Queensland (Ibid).

### **2.3 Community engagement in biodiversity conservation**

Many of the biodiversity policy instruments that have been developed at international, through to the national, state, regional, and local jurisdictions recognise that community engagement, coupled with capacity building, is a key component of a successful policy response to stemming biodiversity decline. The first of the ten national targets of Australia's Biodiversity Conservation Strategy is 'By 2015, achieve a 25% increase in the number of Australians and public and private organisations who participate in biodiversity conservation activities'. The *Draft New South Wales Biodiversity Strategy 2010-15* (DECCW 2011, p. 13) highlights that partnerships with communities and stakeholders is 'fundamental' as community partnerships can 'bring together the collective skills and capacities of a range of groups from government, industry, academic and other voluntary sectors' and states that 'effective implementation of the proposed actions can only be achieved through improved partnerships with landholders, non-government organisations, local government, Aboriginal communities and community groups at a regional and local level' (Ibid, p. 1). The *Protecting Victoria's Environment – Biodiversity 2037* (State of Victoria 2017) lists local governments, Traditional Owners and Landcare as key partners in biodiversity conservation (p. 52) and commits to increased support for and engagement with Traditional Owner corporations, Landcare, local government and community

group programs that encourage community action and greater landholder participation in biodiversity conservation (priorities 11 & 19). The *Draft 100-year Biodiversity Conservation Strategy for Western Australia* (Department of Environment and Conservation 2006, p. iii) includes in its top ten deliverables, to by 2029 deliver a ‘whole-of-community involvement in biodiversity conservation, through awareness and active engagement, including Indigenous people, youth, land managers, private enterprise, community groups, local government, and people from urban, regional and rural areas’.

Huq and Burgin (2016) chart the history of environmental volunteerism in Australia from the Natural History Societies of the 1880; the start of the conservation movement of the late nineteenth and early twentieth centuries; the formation of the National Parks Association (NSW) in 1957; the start of Sydney’s volunteer bushland regeneration groups in the 1970s, through to the council-sponsored ‘Bushcare’ groups that sprang up in urban and peri-urban areas in the late 1980s and early 1990s. But it was the Landcare movement that definitively provided a new momentum to environmental volunteerism.

### **2.3.1 The Landcare movement**

The first Landcare group was formed in Victoria in 1986 with the support of Joan Kirner, Minister for Conservation, Forests and Lands and Heather Mitchell, President of the Victorian Farmers Federation. The Victorian Government allocated \$200,000 in grants to community groups under its Landcare program (Kerin 2017) and by 1990 some 70 groups had formed and by 2006 this had increased to 800 groups in Victoria alone (Youl, Marriott & Nabben 2006). Landcare Australia Ltd was established in 1989 as a means of attracting private, mainly corporate, funding to support Landcare initiatives<sup>1</sup> and Prime Minister Bob Hawke launched the Decade of Landcare, 1990-2000 in July 1989 (Kerin 2017), which saw the flow of substantial funding (\$360 million) through the National Landcare Program and encouraged the Landcare movement to flourish. Funding flowed through federal government programs such as One Billion Trees, Save the Bush, and the Murray-Darling NRM program in the 1990s. The National

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<sup>1</sup> The author became actively involved in Landcare in 1990 and served on the Landcare Australia Ltd board and national advisory committee 2006-09

Heritage Trust (NHT) injected \$1.3 billion into NRM programs from 1997-02, and an additional \$1.4 billion through the National Action Plan for Salinity and Water Quality from 2000-08; followed by \$1.2 billion with NHT2 (2002-08); \$2.25 billion for the Caring for our Country program (2008-13) and subsequently additional funds into the Biodiversity Fund, Working on Country and Green Army program.

A key feature of these programs is they all sought to engage the community in initiatives aimed at improving land management; protecting biodiversity assets and restoring degraded landscapes (DAFF 2008, Gooch 2003). It is testimony to the success of this community engagement focus that by 2008 the Landcare movement had grown to include over 4,000 Landcare groups, over 2,000 Coastcare groups and thousands of other Bushcare, Rivercare and 'Friends of' groups (DAFF 2008, p. 13). Over time many Landcare groups formed Landcare networks to facilitate regional collaboration and enable them to source the funds to employ a coordinator and adopt a more professional approach to NRM problems (Youl, Marriott & Nabben 2006). Nonetheless, the heart and soul of the Landcare movement remained in its volunteer community groups. While Bushcare grew as an offshoot from the Landcare program, Bushcare groups are generally auspiced by local government and operate on local government bushland reserves and on crown lands under the care, control and management of Local Government Authorities. These are therefore discussed in the section on conservation volunteering through local government.

The focus on community engagement, capacity building, and participation in natural resource management is widely acknowledged as central to the successful delivery of these programs (Department of Sustainability, Environment, Water, Population and Communities 2011, p.6). Andrew Campbell, the first National Landcare Facilitator (from 1990-92) and respected farming figure and Landcare advocate, in a presentation to the Chairs of the nation's NRM regional bodies argued the need to 'revitalise' Landcare and the regional NRM framework. Among the key imperatives he outlined was the need for a framework at a regional scale 'with strong community support, involving community leaders and engaging grassroots volunteers' (Campbell 2009).

The important contribution made by the volunteers in Landcare nurseries, Aboriginal nurseries and local government-run community nurseries is discussed in section 2.5, Volunteering for Conservation. While all three of these community nursery sectors are important, only local government community nurseries are included in this study.

### **2.3.2 Aboriginal land management for biodiversity**

The revival of Aboriginal engagement in land management in Australia has been supported by funding for 'Caring for Country' Aboriginal ranger programs, 'Land and Sea Management' initiatives, cultural heritage mapping and Aboriginal community nursery projects; all of which all rely on the volunteer contribution of community elders and knowledge holders who act as cultural advisors and mentors. Their voluntary contributions, while often not explicitly acknowledged or highlighted, lies at the heart of the success of these programs.

The UN Convention on Biological Diversity (CBD) includes measures relating to the protection of Indigenous traditional knowledge and the conservation and sustainable use of biodiversity, as articulated in Article 8 (j) and 10 (c). This is also articulated in Principle 22 of the UN Rio Declaration (UNCED 1992), and Articles 24, 29 and 31 of the UN Declaration on the Rights of Indigenous Peoples (UNDRIP 2007). They are reflected in the Australian Biodiversity Conservation Strategy 2010-30, especially Target 2 and Priority Action A6; in the *Draft New South Wales Biodiversity Strategy 2010-15* (DECCW 2011, p. 12); in the *Draft 100-year Biodiversity Conservation Strategy for Western Australia* (Department of Environment and Conservation 2006); in the *No Species Loss Nature Conservation Strategy for South Australia 2007–2017*; and in *Protecting Victoria's Environment – Biodiversity 2037* (State of Victoria 2017) priorities 14, 15, 16.

Over the past two decades there has been a growing recognition of the significant benefits to biodiversity conservation across northern and remote Australia from engaging Aboriginal people in land management (Pyne 1991, Marshall 2011, Flannery 2012, Gillies 2017). This was also highlighted in the Australian State of the Environment Report (2011, p. 575) which stated that the 'Indigenous land and sea management movement stands out for its growing

professionalism and the capacity it has developed to address threats to biodiversity'. Harnessing traditional ecological knowledge (TEK) is increasingly recognised as crucial to preserving biodiversity in remote Australia, and it is argued that preserving the Aboriginal languages that embed complex layers of this knowledge is also crucial (Centre of Excellence in Natural Resource Management 2010, Nursey-Bray 2015, Marshall 2017). The importance of Aboriginal TEK has been recognised by the Australian Government, especially when it draws together the use of TEK, local knowledge and western science 'to protect, restore and better manage the environment and productive agricultural lands' (Commonwealth of Australia 2008, Commonwealth of Australia 2008a, Australian Government 2008, Commonwealth of Australia 2009).

Managing bushfood and medicine plants and teaching this to young people was identified as crucial by Traditional Owners in Central Australia (Walsh and Mitchell 2002) and in the Kimberley (Vernes 2011):

Elders continue to contribute time and knowledge to ensure caring for country activities and decisions relating to land and its people are sound. Passing on this knowledge remains a crucial aspect of land management or caring for country (Ibid, p. 23)

The importance of intergenerational transfer of TEK was acknowledged by the Green Army Program (Australian Government 2014), and 77% of regional NRM plans have now identified Aboriginal knowledge and understanding of the land as 'a critical asset' and aim to engage and empower Indigenous communities directly in natural resource management (NRM Regions Australia 2014).

### **2.3.3 Local government environmental management**

The role of local government in environmental management has steadily increased over the last 25 years, spurred on by international instruments that promote the value that local government can bring to this role, and also by changes in legislative and administrative responsibilities between federal, state and local governments. Local government associations have also vocally advocated for an increased role for local government authorities in natural resource management (ALGA 1998, Local Government NSW 2017).

Section III of the Rio Declaration on Environment and Development (Agenda 21) Declaration gives recognition to the principle that environment and sustainable development issues need to be addressed at all scales of government and chapter 28 refers to local government as 'the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development' (UNCED 1992). This sentiment was endorsed by the National Local Government Biodiversity Strategy, adopted unanimously at the National General Assembly of Local Government in November 1998, which acknowledged the 'willingness of Local Government across Australia to play a lead role in dealing with our most pressing and complex conservation issue - the loss of biodiversity' (ALGA 1998). The ALGA argued that, due to its existing infrastructure and its links with the local community, Local Government is 'the best placed sphere of Government' to deliver biodiversity conservation initiatives. However, it also argued that expertise and human resources are critical if local government is to be active in biodiversity conservation, that the lack of financial resources was a major deterrent, and stressed the need for LGAs to be given the legislative capacity to raise funds for biodiversity management through special rates and levies (Ibid, p. 27).

In regard to local government in New South Wales, Kelly (2011) reports that the introduction of the *Local Government Act 1993* (NSW) created requirements for LGAs to prepare State of the Environment Reports (SoERs), and amendments in 1997 expanded the matters required to be addressed in the SoERs, especially in regard to the *Threatened Species Conservation Act 1995* (NSW) and the *Local Government Amendment (Ecologically Sustainable Development) Act 1997* (NSW); and strengthened the linkages between SoERs and the preparation of council Management Plans. Then the *Local Government Amendment (Community Land Management) Act 1998* added requirements to retain bushland and protect its plant and animal communities, restore degraded bushland, and ensure the ongoing ecological viability and biodiversity of bushland areas (Ibid).

The *Local Government (General) Regulation 2005* (NSW) (LGGR) expanded the Environment Protection Activities permitted under the *Local Government Act 1993* (NSW) from 'activities to properly manage, develop, protect, restore,

enhance and conserve the environment' to include 'activities such as resourcing voluntary conservation groups and providing workshops on establishing back and front yards with locally indigenous plant species' (Kelly 2011, p. 4). However, local government funding restraints, overworked and unqualified staff along with resentment, especially in rural and regional areas, resulted in generally poor levels of implementation or incorporation into decision making (Ibid, p. 10).

The environmental functions of local government in New South Wales underwent further substantial change with the enactment of *Local Government Amendment (Planning and Reporting) Act 2009* (NSW) which introduced a 'quadruple bottom line' approach requiring that civic leadership, social, environmental and economic issues be addressed in an integrated manner through the preparation of Community Strategic Plans (s. 402), Delivery Programs (s 404), and Operational Plans (s 405). The new legislative framework retained the statutory obligation on councils for State of the Environment Reporting (SoER) under s 428A and linked these to the Community Strategic Plans, Delivery Programs and Operational Plans, which Kelly (2011) concedes has potential to provide for improved environmental management by local government. Indeed, Mercer and Jotkowitz (2000) argue for the implementation of a similar SoE reporting framework in Victoria, which they believe would help provide the capacity to assess the comparative environmental performance of Victorian LGAs, especially as regards implementation of Agenda 21 matters.

A discussion paper produced for the South Australian Local Government Association and Environment Protection Agency (Prodirections Pty Ltd 2000) reported that 'Councils do not have the authority, resources or expertise to react and address environmental matters appropriately' and argued that the environment levies used in metropolitan Adelaide be retained into the long term to support the environmental protection functions of rural local governments. It further argued that 'green levies' are viewed by the community as being 'politically acceptable' (Ibid p. 20). A 2006 review of local government engagement in natural resource management in Western Australia (Government of Western Australia 2006) reported that smaller LGAs generally lacked the skills and resources needed for a strategic approach to NRM and the state's NRM

structures and frameworks have generally failed to identify clear 'entry points' for LGAs to deepen their engagement in NRM. As a result local government involvement was described as 'sporadic' and 'somewhat opportunistic rather than strategic' (Malin, cited in Government of Western Australia 2006, p. 42).

In Australia as in the USA, UK, Sweden and China, environmental management and sustainable development are new functions taken on by local government and both federal and state legislation in Australia has increased local government responsibilities toward threatened species and communities (Stenhouse 2004). Research into local government roles and actions for the protection and management of bushland, and whether there is a consistent approach in urban areas compared to urban-rural areas, showed Australia's LGAs had a 'high level of willingness to be involved in biodiversity conservation in urban areas' and highlighted their efforts were generally constrained by low budgets, a lack of staff, minimal state government support and limited coordination within and across regions. Stenhouse (2004) concluded that LGAs are actively motivated in their biodiversity conservation role, and asserts that 'the important next step' is to build on their capacity to conserve local biodiversity.

A contrast has been drawn between the pivotal role of local government in strategic land-use planning and open space management, the fact local government is generally resource poor, especially rural LGAs, controlling a small share of the total government budget but spending a disproportionately large amount of their resources on environmental management (Wild River 2003, Wild River 2005). Case study research undertaken by Pini and Haslam McKenzie (2006) found there had only been limited community engagement in natural resource management at the local government level in rural areas of Australia; and expressed the view that 'researchers have demonstrated little interest in examining why this may be the case and in identifying the types of barriers that may impede natural resource management by rural local governments'. They identified the significant constraints imposed by a shortage of essential resources: money, time, expertise, statutory powers and political will; along with a lack of data and knowledge, poor consultation with stakeholders, and a lack of coherent environmental powers at the local level.



A literature review into the devolution of responsibilities from state and federal government to local government that has occurred in Australia since 1989 found it occurred without a corresponding shift in financial resources available to local government; which are tightly constrained in their capacity to raise revenue (Pini, Wild River & Haslam McKenzie 2007). They pointed out that, while rural and regional areas in Australia face extensive natural resource management problems, the financial problems and viability issues suffered by rural and remote LGAs are much more pronounced than those faced the metropolitan and urban fringe LGAs. They conclude that 'unless State and federal governments recognise the particular impediments that non-metropolitan local councils face in addressing the environment and resource them accordingly, there is little hope of reducing or preventing further natural resource management degradation in rural Australia' (Ibid, p. 172).

In relation to the impact of financial constraints on local government capacity to manage environmental impacts, Mercer and Jotkowitz (2000) refer to a UN comparative survey of local government in 15 countries (ESCAP 1999) which characterised the Australian situation as 'the Commonwealth collects and holds all the money, the states hold all the power and local government is left with all the problems' (Ibid p. 164) and conclude that 'there can be no possibility of genuine progress in making sustainability work at the local level' without a change in state and federal funding to the local level and a shift of powers to local government (Ibid p. 166).

### **Grant funding**

A 2011 review of local government engagement with the Caring for our Country program described local government engagement as 'quite patchy', reporting there had been 'little or no engagement between Caring for our Country and local government, even though local government has functions and responsibilities that directly support local communities and deliver sustainable approaches to land use and natural resource management and planning' (Australian Government 2011b, p. 8). The reluctance of local government to seek grant funding from programs such as Caring for our Country was analysed by

Pini, Wild River and Haslam McKenzie (2007) who found that local government agencies often had significant doubts about program continuity, particularly following a change of government, and had concerns that they could be left with responsibility to continue resourcing an expanded NRM program from their limited financial resources. Bates and Meares (2010 p. 52) also referred to these issues, adding that grants are highly competitive, require skilled personnel to invest considerable time to write submissions and often require significant matching resources.

### **Environmental levies**

In a review of funding options for local government functions as 'environmental manager and protector' Bates and Meares (2010) argue that a capacity to deliver on environmental responsibilities 'depends heavily on their capacity to fund and resource appropriate personnel'. They report that environmental levies are becoming quite common as a means of providing such resources. NSW local governments have used special levies to fund stormwater programs for some time and have used levies to fund environmental compliance since 2000. However environment levies to fund community engagement sustainability programs are a fairly recent innovation and Councils require approval from the Minister for Local Government for their introduction. In NSW rate increases are regulated by the Independent Pricing & Regulatory Tribunal (IPART). Councils seeking to introduce or extend an environment levy must justify this to IPART and demonstrate the support of ratepayers; although Ministerial approval is unlikely to be withheld where a Council can demonstrate firm community support (Bates and Meares 2010, p. 41).

Until recently IPART only recommended approval of limited term environment levies (3-5 years) but in 2016 Wingecarribee Shire Council (WSC) in the rural NSW was one of the first LGAs to have its environment levy approved 'in perpetuity'. This levy raises approximately \$900,000/year to fund environment and sustainability initiatives, including community engagement in its Bushcare program. Environment levies represent a 'game changer' for rural and regional local governments, significantly increasing their capacity to run biodiversity

conservation programs. For example, WSC manages over 4,000 ha of bushland reserve including a number of Endangered Ecological Communities, 130km of public waterways and over 100 endangered species, making its environment levy a vital funding source for bushland management (Wingecarribee Shire Council 2017).

### **Other issues**

The barriers to effective management of natural resources by rural LGAs in Australia were grouped around four main themes by Pini, Wild River and Haslam McKenzie (2007): capacity, commitment, coordination and community; and they concluded that these constraints were 'exacerbated in the rural context'. These themes were summarised as: Capacity - being under-resourced and over-stretched as a result of the devolution of responsibilities from other tiers of government; Commitment – lack of adequate resourcing for environmental sustainability from senior management; Coordination – lack of integration and inconsistent consultation between agencies representing the various tiers of government along with a policy ambiguity; and Community – perceived community concerns over the diversion of limited Council funds away from the provision of services and infrastructure.

Nonetheless, Local Government NSW (2017) asserts that 'Councils have a pivotal role in environmental management, including regulation and education' and to 'take up environmental improvement programs and initiatives'. The Draft NSW Biodiversity Strategy 2010-2015 also indicates that local government has a key role to play in managing invasive species (p. 15) and conserving threatened species (p. 73). Prominent Landcare figure, Andrew Campbell, now director of the Research School for the Environment and Livelihoods, Charles Darwin University, recently renewed his 1990 call for all Landcare coordinators and facilitators to be employed at local government level, which he argues would deliver 'a much greater buy-in' by local government where the 'vast majority of decisions that affect natural resources' are made (Landcare Australia 2014).

## **2.4 Volunteering in society**

### **2.4.1 International perspectives on volunteering**

With the strong emphasis on community engagement in stemming biodiversity decline at international, national, state and local government levels and evidence that environmental volunteers can play an important role in biodiversity conservation, it is useful to review the literature on volunteering, including its history, character and social and economic significance.

In recent decades the value of volunteering in the community has become increasingly recognised, such that both international bodies and nation states are seeking to encourage, support, document and understand the role that volunteer effort plays in their communities and their economy. Anheier and Salamon (1999) traced the birth of the modern formal volunteer movement to the creation of the Red Cross in 1864 and report that the United Nations Volunteer program emerged in 1971 and was later joined by various government-organised programs (such as the Peace Corps); followed by volunteer organizations like Amnesty International and Médecins Sans Frontières. By the 1990s various UN forums were highlighting the contribution of volunteers. In 1997, the 52<sup>nd</sup> General Assembly of the United Nations declared 2001 as the *Year of the Volunteer* and designated 5<sup>th</sup> December as International Volunteer Day. Meier and Stutzer (2004) point to the crucial dependence of many charitable organizations on the work provided by volunteers and state that ‘many community services only exist because people voluntarily offer their work free of charge’. The data available on the value of volunteer work indicates that it is very substantial. In the United States more than 50% of all adults do volunteer work, the value of which is equivalent of 5 million full-time jobs, while in Europe 32.1% of the population do volunteer work, which constitutes an equivalent of 4.5 million full time jobs (Anheier and Salamon 1999, p. 58). In Canada it is estimated that people over 45 years of age collectively contributed more than 1 billion hours in 2010 alone (Cook & Sladowski 2013). Data generated by the John Hopkins Comparative Nonprofit Sector Project (Salamon Sokolowski & Associates, cited in International Labour Organisation 2011) estimated that volunteers make a \$400 billion annual contribution to the global economy.

Over 1 million New Zealanders participate in volunteering (Smith & Cordery 2010) where 31% of the population volunteered 270 million hours in 2004, valued at \$3.3 billion (Statistics New Zealand 2007). This percentage is reported to be similar to that in Australia (32%), higher than Canada and the United States (27%) but lower than the United Kingdom (39%). However Smith and Cordery caution that cultural differences in how the term 'volunteering' is understood may lead to under-reporting of contributions, particularly in Māori, Pacific and ethnic communities where contributing to the common good (e.g. the Māori concept of *mahi aroha*) encapsulates similar actions.

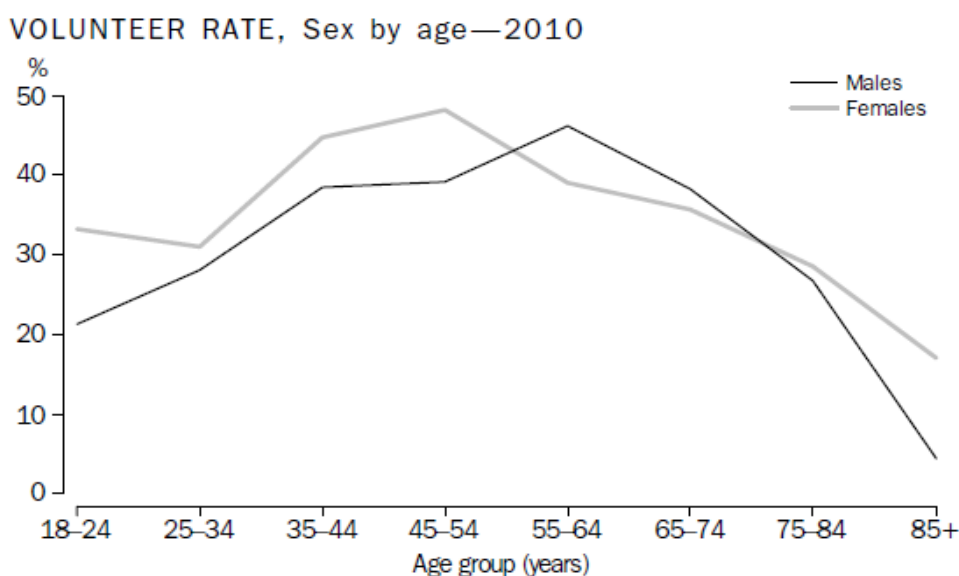
A similar caution has been drawn in the Australian National Volunteering Strategy which reports that the contributions of some cultural groups are under-represented in the volunteering data: 'Culturally and linguistically diverse communities and Indigenous communities, in particular, often give large amounts of time to supporting others but report lower rates of formal volunteering' (Volunteering Australia 2005). This was discussed above in relation to the significant volunteer contribution made by Aboriginal elders in their role as cultural advisors and mentors to the Working on Country Aboriginal Ranger Program. The United Nations General Assembly passed Resolution A/RES/56/38 to encourage member states to establish the economic value of volunteering and Resolution A/RES/60/134 calling for member states to build up a knowledge base, disseminate data and expand research on other volunteer-related issues (International Labour Organization 2011). According to the ILO, 'boosting the visibility and highlighting the importance of volunteer work can stimulate volunteer effort thus bringing additional resources to bear on pressing social, environmental and economic problems'.

#### **2.4.2 Australian volunteer data**

The Australian Bureau of Statistics asserts that 'the importance of voluntary work to national life is increasingly being recognised' and that voluntary work 'meets needs and expands opportunities for democratic participation, personal development and recreation within a community and helps to develop and reinforce social networks and cohesion' (ABS 2011). Volunteering rates in Australia were reported to be comparable with those in other OECD countries

with more than six million adult Australians, or 36% of the population aged over 18, formally volunteering in 2010 (Ibid). This proportion has grown from around 24% in 1995 and 32% in 2000 (ABS 2001). The Australian Bureau of Statistics estimates the amount of volunteer time donated in 2006 at over 713 million hours, a median of 56 hours per volunteer (ABS 2007) while the data for 2010 showed an increase in volunteers from 5.2 million to 6.1 million; and also that 7.83 million Australians volunteered in 2014 (ABS 2015).

The 2010 ABS survey found that volunteer rates varied across different age groups, particularly with ‘life stage’; those in middle aged being more likely to volunteer than those in younger and older age groups and higher rates of females volunteering except in the 55-74 age brackets when a higher percentage of men volunteered (figure 1).



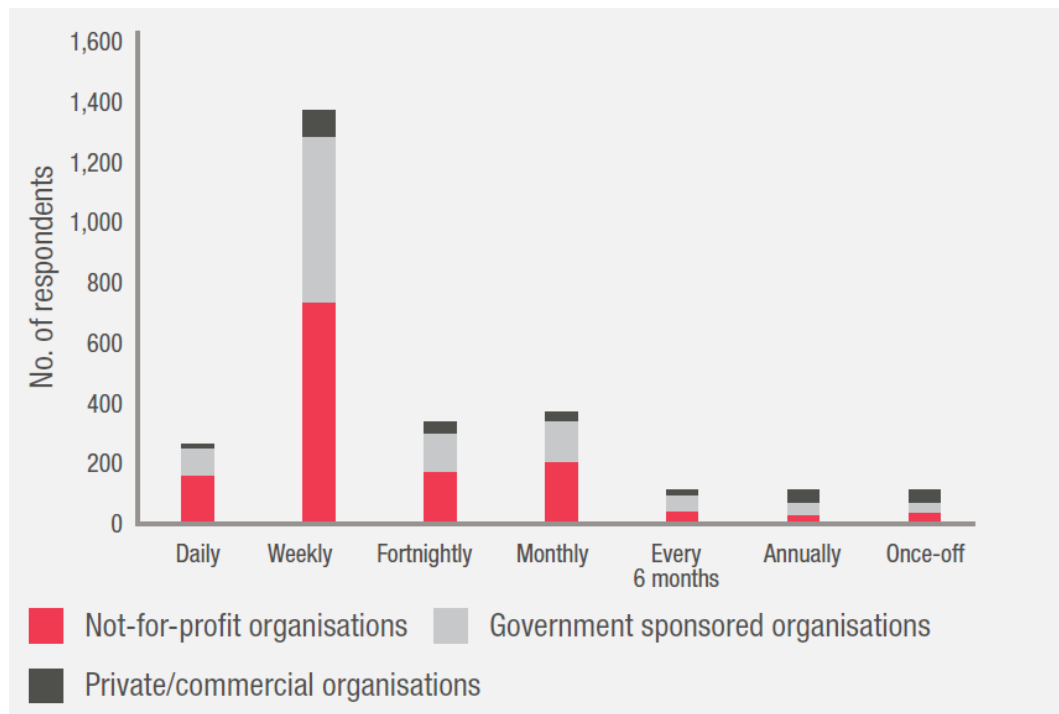
**Figure 1: Australian volunteer rate by sex and age**

Source: ABS 2010, Voluntary work Australia

The Productivity Commission estimated the value of the unpaid labour contribution by the not-for-profit sector in Australia during 2006–07 was over \$14.6 billion (Australian Government 2011, p. 11). Two-thirds of those volunteers participated at least once a month with most contributing 5-10 hours per month; the most frequent volunteering areas being sports & recreation (28%); social services (17%); kindergarten & child care (13%); community development (13%);

religion (13%); health (8%); culture & arts (7%); advocacy (7%). A survey of general community volunteering (Volunteering Australia 2016) showed that weekly volunteering was most common; the bulk of volunteers volunteering at least monthly (figure 2a); the most common extent of volunteering (by ~ 29% of respondents) being 200+ hours per annum or 4 hours per week (figure 2b).

Figure 2(a): Frequency of volunteer engagement



2(b): Estimated number of hours of volunteering in the last 12 months

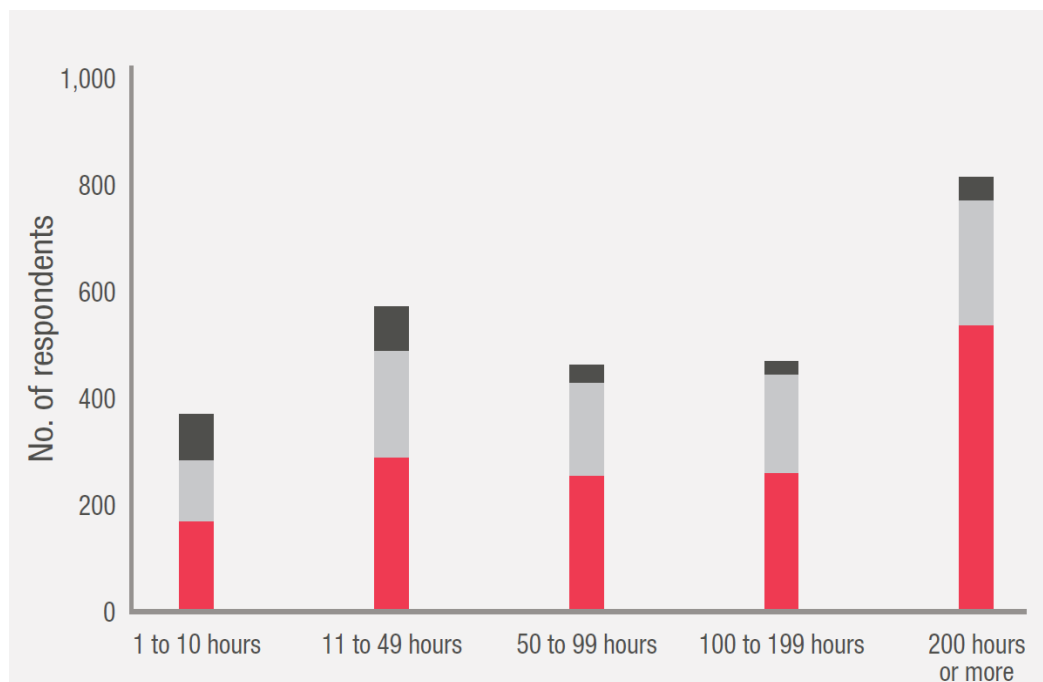


Figure 2 (a) Frequency and 2 (b) Extent of volunteer effort in the general population Source: Volunteering Australia (2016)

The ABS 2010 data showed that 35% of adult volunteers volunteered at least once a week, while a further 27% volunteered less frequently, but at least once a month; and showed that volunteers were more likely to be involved in other aspects of community life than those who had not volunteered in the last 12 months. In terms of overall life satisfaction the ABS data revealed that 82% of volunteers were delighted, pleased or mostly satisfied with their lives, compared to 75% of non-volunteers. This is consistent with the view that volunteering brings health and wellbeing benefits to participants, such as reduced stress, better physical and mental health and greater longevity, and that the social connections developed through volunteering can contribute meaning, a sense of purpose and satisfaction to people’s lives (Australian Government 2011, Cook & Sladowski 2013).

Table 1 below shows the volunteer sectors, numbers and proportions identified in the 2014 ABS survey indicating that during 2014 some 224,700 people, or 3.9% of the total volunteer workforce, volunteered in the environment sector, where they contributed 29.4 million volunteer hours (ABS 2015).

**Table 1: Characteristics of voluntary work in Australia**

Source: General Social Survey of Australia (ABS 2015, table 21.2)

Type(s) of organisation(s) they did unpaid voluntary work for in last 12 months	ESTIMATES ('000)	PROPORTIONS (%)
Sport and physical recreation	1,801.9	31.1
Welfare/Community	1,226.4	21.2
Religious	1,096.4	18.9
Education and training	1,386.0	23.9
Health	592.8	10.2
Parenting, children and youth	314.3	5.4
Emergency services	217.1	3.8
Arts/Heritage	219.4	3.8
Environment	224.7	3.9
Business/Professional/Union	121.9	2.1
Other	629.4	10.9
	7,830.3	



### **2.4.3 Australian National Volunteering Strategy**

Australia's National Volunteering Strategy was launched by the Minister for Social Inclusion and Minister for Human Services in 2011 to mark the 10<sup>th</sup> anniversary of the United Nations International Year of Volunteers. In addition to setting out a vision for the future of volunteering in Australia, in which 'volunteering is encouraged, supported and recognised' it also 'explores emerging issues and challenges for the volunteering sector' and sought to strengthen volunteer management and training, improve volunteer advocacy and increase the recognition of volunteers (Australian Government 2011).

The National Volunteering Strategy acknowledged that research to measure volunteer work 'plays a vital role in improving the effectiveness of volunteer policy and programs'. While the strategy points out that many organisations and governments 'currently collect data and information about volunteering, alongside the national data collected by the Australian Bureau of Statistics' there is a need to collect better data (Ibid, p. 29). The Australian Government committed itself to produce a report card every three years, drawing on available quantitative data on trends in volunteering, with qualitative data from the Volunteering Australia survey and case studies to be integrated into the report card. The first of these report cards was due for release in 2014, but with the swearing in of the Abbott Federal Government on 18 September 2013, both the Social Inclusion Unit and the Office for the Not-for-Profit Sector were disbanded. Arguably, government support for volunteering in Australia is continuing to erode (Pro Bono Australia 2017).

Nonetheless, as the National Volunteering Strategy pointed out 'opportunities exist for researchers and the volunteering sector to work together to make the best use of existing data and information, coordinate research and survey work, and shape the research agenda to meet contemporary challenges in volunteering'. This thesis takes up the challenge to research a gap in the data by researching an important volunteer sector that makes a valuable contribution to biodiversity.

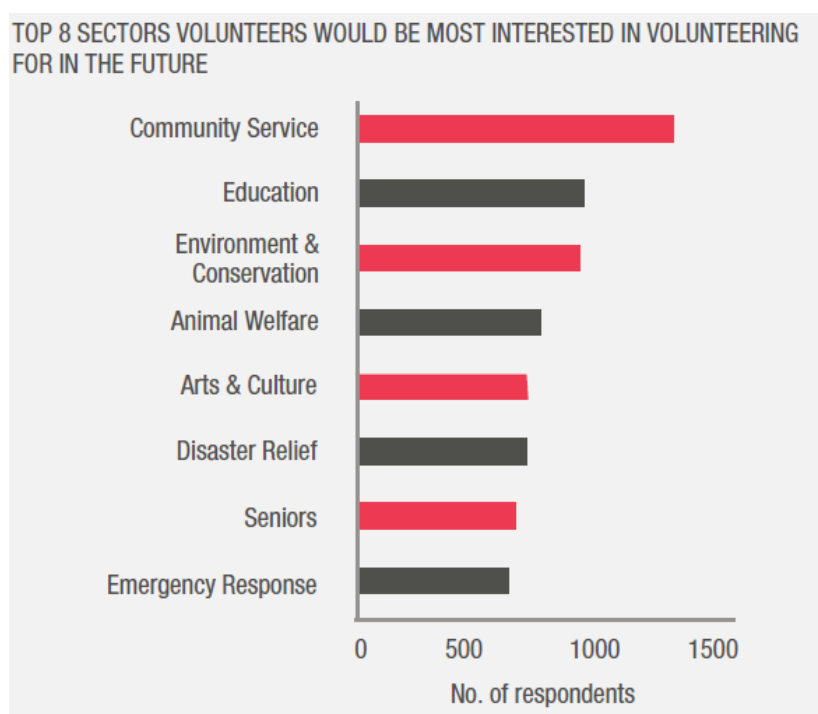
## 2.5 Volunteering for Conservation

Community volunteers have become a vital and highly valued component in efforts to conserve and protect natural areas and reduce the serious decline in biodiversity throughout Australia and around the world. Conservation volunteering encompasses advocacy, research and education, environmental monitoring (including citizen science) as well as on-ground revegetation and rehabilitation. It is expressed through initiatives such as Landcare, Bushcare, Rivercare, Integrated Catchment Management (ICM) groups, Coastcare, and the various 'Friends of' groups, who along with groups like Greening Australia and Conservation Volunteers Australia engage community volunteers in 'on ground' natural resource management activities. The 'on ground' activities of these groups extend upon and complement the research, education, policy development, strategy formulation and advocacy roles of the various Nature Conservation Councils, and groups like ACF and WWF (Huq and Burgin 2016).

Social Research conducted for the NSW government indicated that 20% of the respondents surveyed had taken part in a Landcare, Bushcare, tree planting or other restoration project in 2009 (DECCW, 2010, p 75) while the 2012 survey found only 17% of respondents had taken part in such activities; 21% of respondents from outside Sydney having volunteered in these roles compared to 15% of Sydney residents (OEH 2013).

The 2012 survey found that 79% of respondents had spent time in bushland or other natural areas in the previous year; almost half (45%) believed there is too little emphasis on protecting natural habitats in NSW; and a large majority of (71%) were concerned about environmental problems, with 23% saying they have a 'great deal of concern'; 40% expressing a 'fair amount of concern', and 8% saying they are 'only a little concerned'. It also found that women were more concerned (75%) than men (67%) about environmental problems; those aged 45-54 are more likely to be 'concerned a great deal' (30% vs 23% community-wide), and those aged 55-64 (36% vs 23%); retirees are more likely to be 'concerned a great deal' (31% vs. 23%) and university graduates were more likely to be 'concerned' (79% vs 71%) or 'concerned a great deal' (31% vs. 23%).

Price Waterhouse Coopers Australia (PwC) conducted a volunteer survey on behalf of Volunteering Australia with 2,304 respondents (31% male, 68% female; 70% metropolitan residents, 30% regional or remote residents) and found formal volunteering accounted for 48% of the volunteer activity; informal volunteering accounted for 6%, with 40% of respondents having undertaken both formal and informal volunteering. Volunteering in the environment and conservation sector of was the third most attractive to the respondents after community service and education (Volunteering Australia 2016) as shown in figure 3 below.



**Figure 3: Top 8 sectors of most interest to volunteers**

Source: Volunteering Australia 2016

### 2.5.1 Conservation volunteering in New Zealand

New Zealand is following a worldwide trend that has seen a continual rise in volunteer input into the conservation and natural resource management sector (Peters 2015, p. 118) with increased expectations by the resource management agencies for contributions by volunteer groups to biodiversity conservation.

Peters (2015) undertook a study of group and project characteristics, restoration objectives, group activities, and support provided by project partners, with 296 groups from all mainland areas of New Zealand responding to the survey. Nearly

three-quarters (72%) of the respondent groups reported having 20 or fewer active participants. The survey showed that 54% of active group participants were in the 51–65 year age bracket, with 13% being 66 years or over, 26% in the 31–50 year age bracket and just 8% being 30 or younger.

While the groups were engaged in a range of environmental activities from advocacy and education, community building, amenity enhancement, and environmental monitoring, 86% reported participation in weed control activities and 85% in the planting of natives. The survey revealed that 54% of group environmental restoration projects were being undertaken in rural areas, 28% in peri-urban areas and 18% in urban areas. Only 2% reported involvement in plant propagation activities. Local government was the most significant provider of technical support, funding and on-ground works with nearly one-third (31%) of the groups receiving support for their activities from local councils.

### **2.5.2 Landcare Volunteers**

The Landcare movement has undergone incredible growth, and by 2004 had more than 700 groups in its 'birth state' of Victoria with 23,220 members and a further 30,282 volunteers (Curtis & Cooke 2006); and around 4,500 groups nationally, comprising around 120,000 volunteers (Salt 2016) This emanated from a broad community recognition of the need to address serious challenges in biodiversity decline and land and water management (Curtis et al 2008) and the acknowledgement that to effectively address the 'wicked problems' that had developed necessarily requires a collaborative approach (Robins & Kanowski 2011). The 'Landcare movement' also has displayed a growing sophistication, which has seen some of the larger regional and peri-urban groups adopt a community enterprise model, operating nurseries and providing contracting and consulting services, to generate a portion of their income. Many local governments have supported Landcare groups with office space, administrative support, and funds to employ coordinators, and also assist Landcare groups operationally, although Landcare has consistently relied on the unpaid efforts of landowners and community volunteers (Youl, Marriott & Nabben 2006).

Over the 25 years of the Landcare movement's history, the various 'phases' of NRM funding (NLP, NHT1, NAPSWQ, NHT2, CFoC) have seen a shift away from locally-driven projects run by Landcare groups, towards regional investment strategies and Environmental Stewardship Programs run by regional bodies/ CMAs, and a shift towards the use of market-based instruments (MBI) to achieve the more targeted and efficient use of funds (Salt 2016). This shift had significant implications for the Landcare movement (Mooney et al 2007, Tennent & Lockie 2012). Robins and Kanowski (2011) are highly critical of the way the CfoC national priorities were developed and implemented asserting they were a 'retreat from the ... participatory approaches to NRM delivery that were progressively evolved under the NHT and related programs'. These sentiments were also echoed by the NRM Regional Bodies submission to the Senate Inquiry into the National Landcare Program (NRM Regions Australia 2014) which bemoaned the lack of opportunity to input to the CfoC Program design, especially in regard to the changed arrangements for funding Landcare groups; the move away from building capacity and social capital, and away from a collaborative model to a competitive process with high transaction costs. In their Senate submission, the NRM Regional Bodies acknowledge community volunteer groups are 'essential to regional NRM programs' and are regarded as 'major partners in delivering the NRM outcomes'.

Curtis et al (2008) point out that Landcare group activity is 'an investment in capacity-building of both human and social capital' and they indicate that these 'are vital characteristics of any community's capacity to respond to the challenges of sustainability'. Salt (2016) draws attention to concerns that the early achievements of Landcare and the 'stocks of human and social capital' are at risk of being lost; that the 'drive for efficiency may have come at the cost of effectiveness'. Both Tennent and Lockie (2012) and Salt (2016) point to evidence that the membership of Landcare groups in WA, Victoria and NSW has been declining and volunteer burn out has been reported in many places. Gooch and Warburton (2009) assert that sporadic funding erodes the resilience and undermines the viability of Landcare groups. Salt's criticism of the policy shifts in NRM funding delivery is biting: 'It moved from cultivating an ethic rooted in

collaboration, sharing, and volunteerism to a culture of benefit-cost analysis and fee for service' (Ibid, p. 102). Similar concerns were expressed by the Senate Standing Committee on Rural and Regional Affairs:

Where previous programs had successfully mobilised people and resources in all levels of government, private industry and local communities, Caring for our Country has effectively disenfranchised people engaged with NRM' (Commonwealth of Australia 2010, p.73).

## **2.6 Conservation volunteering through local government**

It has been reported that local councils support the majority of the work done by environmental volunteers in the Sydney metropolitan area (SMCMA 2012).

Analysis of local government engagement of volunteers in the conservation and management of native vegetation (Stenhouse 2004) found that 94% of the local government authorities (LGAs) surveyed cooperate with groups of community volunteers that care for local bushland by supplying tools, materials and plants, and providing assistance with seeking grants, grant administration, technical advice and on-ground works. In Sydney 33% of LGAs supervised on-ground volunteers and 30% provided those volunteers with training (Ibid).

The Sydney-based Volunteer Coordinators Network (VCN) published its first guide to developing a Bushcare Volunteer Program in 1998 as a best practice guide for not-for-profit organisations, including local government agencies, that manage long-term environmental volunteer programs, to assist them to make their 'programs manageable, support their volunteers and keep themselves skilled as professional volunteer program managers' (SMCMA 2012).

### **2.6.1 Bushcare volunteers**

Data on environmental volunteering in the Sydney region has been collected and published periodically with the fourth survey covering 2012 data (Hawkesbury Nepean Catchment Management Authority 2013). The data from the 2012 survey shows that 7,542 regular volunteers together with 20,429 one-off and corporate volunteers contributed 198,762 hours to conservation work in 2012, valued at \$5.96 million. Some 87% of the 'regulars' volunteered through local government programs, and this represented 80% of the hours volunteered, with

an average annual contribution of 24 hours per volunteer. Forty of the sixty-one organisations which provided data for the survey were Local Government Authorities, as were fifteen of the twenty organisations who reported running a community nursery. Bushcare /planting activities made up 90% of the reported volunteer hours, with community nursery work contributing 7%, flora & fauna monitoring 2% and water quality monitoring 1% of the reported volunteer hours (ibid). Note, this data excludes volunteer activities such as rubbish removal and clean ups, work done by students in classroom hours, administration, newsletters, publicity, presentations, and leading guided walks.

An investigation of the character and experience of community volunteers engaged in the Bushcare program within the Shoalhaven local government area (Rankin 2013) focussed on the motivations of volunteers from forty-nine groups (46 Bushcare, 2 Landcare and one Dunecare) all of which undertook works on Council lands with Council support. The vast majority (90%) of survey respondents were over fifty years of age, with 23% in the 51-60 age group, 42% in the 61-70 age group and 21% in the 71-80 age group. A higher proportion of respondents (54%) were female and a quarter of the respondents reported volunteering with more than one Bushcare group. The survey found high volunteer retention levels with the median length of volunteering being six years and the mean being seven years. Some 2% had volunteered for 20+ years, 3% for 16-20 years, 11% had volunteered for 11-15 years and 36% for 6-10 years, while 48% reported they had volunteered for 1-5 years. The average frequency of volunteering varied widely, with a modal frequency of three hours per month and a mean participation of seven hours per month; with 53% of respondents reporting they volunteer five or less hours per month. The strongest reason given by respondents for why they volunteered with the SCC Bushcare program was to 'help the environment' with 'enjoyment and satisfaction' and living in 'close proximity' to the Bushcare site also being significant motivating factors.

A survey conducted in 2009 of Bushcare volunteers in Hornsby (Hornsby Shire Council 2009) revealed that half of them were retired (46.4%) or semi-retired (4.9%) while those working fulltime (28.1%) or part-time (16.7%) made up the bulk of the remainder. Sixty percent of respondents had been volunteering in the

Hornsby Bushcare program for over five years: 2.3% for 20+ years, 10.3% for 12-19 years, 15.6% for 9-12 years and 31.6% for 5-8 years. Only 5.3% were new volunteers, 14.0% had volunteered for 1-2 years and 18.3 had volunteered for 3-5 years. This again demonstrates a very high volunteer retention rate.

## **2.7 What motivates conservation volunteers?**

Research by Smith and Cordery (2010) concluded there is no clear pattern of what motivates volunteers except that 'motivation is multifaceted and complex'. A 2007 literature review probing research on the motivations of environmental volunteers (Bruyere & Rappe 2007) concluded that a minimal amount of research existed concerning their 'motivations, recruitment and retention'. More recent research reported that 41% of volunteers indicated their primary motivation for volunteering was 'volunteering allows them to give something back to the community' (Volunteers Australia 2016).

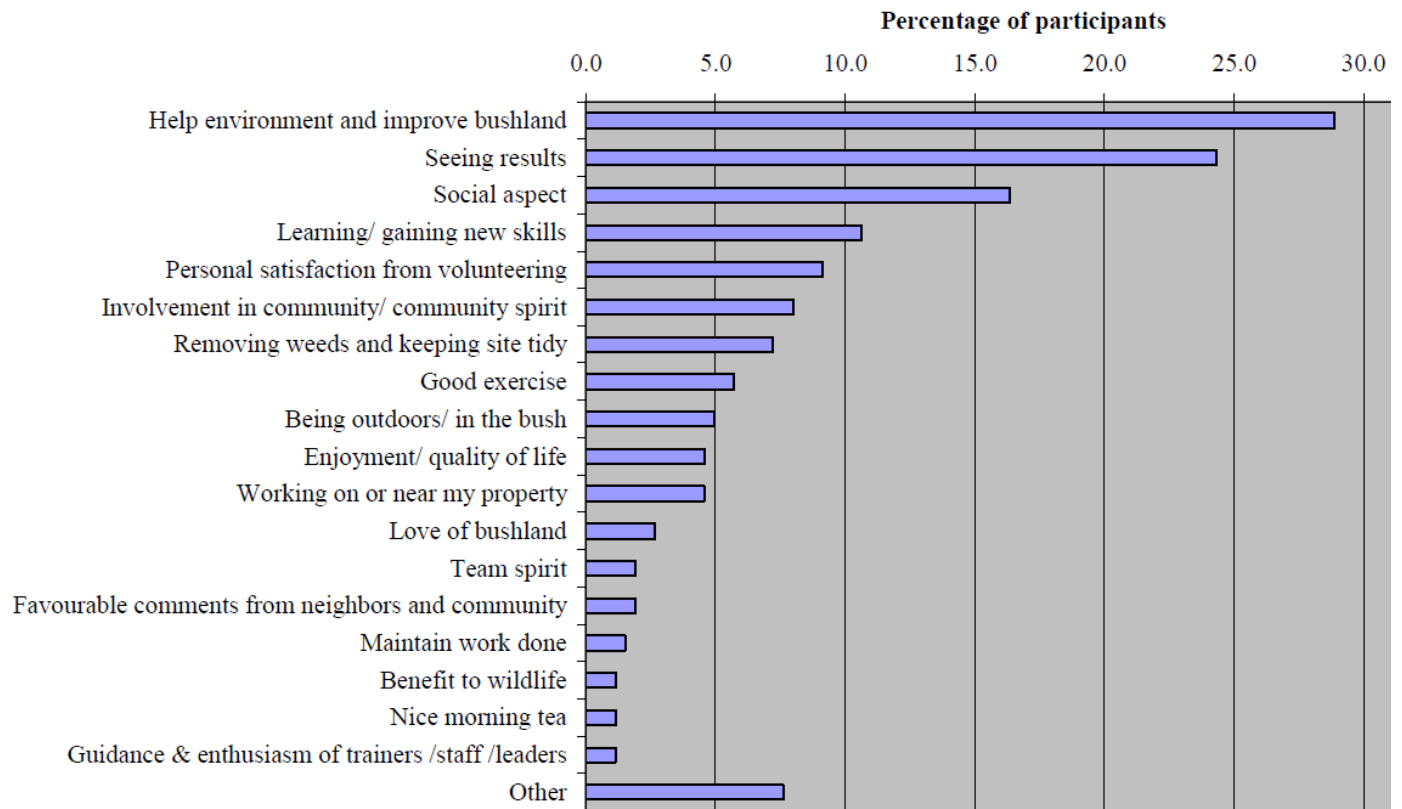
Figure 4 below graphs the percentage of responses in the Hornsby Bushcare survey to the question 'what motivates you to keep going /what do you personally gain from your volunteering?' This shows the greatest motivating factor is to 'help environment and improve bushland' (28%), coupled with 'seeing the results of their activities' (24%). The 'social aspect' was also a strong motivator (16%) especially when combined with 'involvement in community/ community spirit' (8%); with other motivations being a set of personal benefits such as 'learning new skills' (11%), 'personal satisfaction' (9%), 'good exercise' (6%), 'enjoyment of the bush' (7%) and 'enjoyment/quality of life' (5%).

The strongest motivations volunteers expressed for joining the Shoalhaven Bushcare program (Rankin 2013) was also found to be a desire to help the environment, themed around 'help restore natural areas' (98.4%), 'help conserve biodiversity' (95.1%), the desire 'to make a difference' (94.1%) and 'to do something important' (83.2%) with other significant motivations being those relating to 'learning about plants and animals' (90.3%), 'learning about their surroundings' (91.4%) and 'to learn from nature' (79.4%), followed by social factors such as 'to work with a team of people' (76.9%), 'to see familiar faces' (64.9%) and 'to meet new people' (55.7%). Motivations relating to personal



rewards were less significant overall and were expressed as ‘to do something physical’ (71.1%), ‘to have fun’ (57.3%), ‘to have peace of mind’ (43.4%), ‘to feel needed’ (26.3%).

### What motivates bushcarers to continue



**Figure 4: What motivates Bushcarers to continue**

Source: Hornsby Shire Council 2009 Bushcare Survey

The key motivations of volunteers working in environmental stewardship programs in Michigan were identified as ‘helping the environment’, ‘learning new things’ and ‘seeing the tangible benefits of their efforts’ (Ryan et al, 2001) while Constable (2015) found the strongest motivation *by far* for volunteers working on the rehabilitation of Rodley Nature Reserve, in Leeds England, was making a ‘meaningful contribution’.

#### 2.7.1 Characteristics of conservation volunteers

An investigation into the motivations of environmental volunteers in Australia was undertaken to determine whether environmental volunteers display unique characteristics which could assist environmental organisations to more

effectively target their recruitment strategies (Randal & Dolnicar 2006). While the research found environmental volunteers have a similar socio-demographic profile to the general population it did reveal environmental volunteers are more altruistic than non-environmental volunteers and they 'identify significantly more strongly with the local region in which they live than non-volunteers'. This is consistent with the findings of Gooch and Warburton (2009) and Gooch (2003) who found community-based NRM volunteers showed a strong connection to a 'sense of place' and this connection was a strong motivating factor for them. With this in mind Randal & Dolnicar (2006) recommended that marketing campaigns could be better focused by highlighting the 'direct and immediate benefits' to the local environment that their environmental volunteers achieve.

In their analysis of the strength of volunteer motivations, Bruyere & Rappe (2007) found that the factor 'helping the environment' was strongest, and suggested that managers of volunteer programs in natural areas could best meet this motivation by tailoring volunteer projects to include activities 'such as tree-plantings, invasive weed management or retrieving litter from riverbanks'. They also found 'learning' and 'social' motivations were important and suggested they be considered in the planning and implementation of volunteer projects by seeking to understand the particular interests and motivations of the volunteers and structuring activities that resonate with. They emphasised the importance of creating variety in project activities to make for a more positive and satisfying experiences and providing acknowledgement and recognition to volunteers.

Research into the ways in which the 'lay' knowledge of natural resource management volunteers can 'complement abstract scientific knowledge' found there was a significant lack of research that 'examines how knowledge moves and transforms in situations where decontextualized scientific knowledge comes into contact with contextualized volunteers' knowledge', and this limits the opportunity for volunteers and scientists to 'develop a more reflective interaction when they are dealing with questions about ecological restoration' (Buizer, Kurz & Ruthrof 2012, p. 158). This aligns with the assertion that 'conservation is a social process that engages science, not a scientific process that engages society' (Toomey et al 2016, p. 5).

A recent article asserted that ‘few researchers have attempted to identify the types of individuals likely to volunteer for environmental causes’ and argued that identifying the unique characteristics of *potential environmental volunteers* may facilitate targeted marketing and recruitment campaigns and make more efficient use of limited marketing dollars (Randle & Dolicar 2015). The research found that the potential environmental volunteers had different motivations for volunteering and differing personal values to those of non-environmental volunteers, and recommended that recruitment marketing should focus on both *altruistic factors* such as opportunities to support an important global cause, to make tangible improvements to the local area, and on the positive impact they could have on quality of life for future generations; the *egoistic benefits* of volunteering, such as the opportunity to meet new people and make friends with similar values and attitudes. They suggested this would be of particular interest to a large segment of the population that is approaching, or have already reached, retirement age who will be seeking activities to keep them active, healthy and useful (Ibid, p. 337).

## **2.8 Growing plants for biodiversity conservation**

### **2.8.1 Sourcing local provenance plants**

One of the main barriers to effective implementation of programs and projects to restore landscape-scale ecological linkages, and protect and buffer high conservation value remnant vegetation (including Endangered Ecological Communities) is an adequate supply of a diverse range of local provenance plants and the seed to propagate those plants:

The supply of seed and plants for restoration is a widespread problem across Australia ... the local nursery can’t grow or source seed for most of the required species. The seed suppliers can’t supply the seed needed at the short timeframe of the project, in the quantities needed or from the correct locations to maintain genetic integrity (which contributes to resilience) ... Although work to date is beneficial, we need to significantly lift the bar to achieve restoration of habitat and landscape function (Australian Government 2011c, p. 4).

The Australian State of the Environment 2011 Report (p. 677) also highlights a 'failure to improve the ability of regional communities to manage their links with biodiversity' as a major current and emerging risk to biodiversity. Although the Hawkesbury-Nepean Catchment Management Authority's (HNCMA) Local Provenance Plant and Seed Strategy specifies the use of plants grown from local provenance seed, it also reported that nearly all HNCMA staff had problems obtaining local provenance native seed/ plants for their projects and that commercial nurseries were generally not interested in supplying provenance plants (Hawkesbury-Nepean Catchment Management Authority 2007, p. 12).

While it has been argued 'if NRM programs were to promote seed supply planning, this would enable local businesses to supply locally appropriate seed for the species required to restore priority vegetation communities' (Australian Government 2011c), presentations made at a recent ANPC National Native Seed Industry Workshop, representing a broad cross-section of the sector, described a 'fragmented, erratic and insecure market' that lacked coordination and was impacted by short-term project-based demand cycles (ANPC 2016).

It should also be noted that is considerable discussion in the scientific literature on how 'local provenance' should be defined and the emphasis that should be placed on local genetics, species range and the patch size of remnant seed sources in order to maximize the genetic fitness and evolutionary potential of the rehabilitated landscape. The importance of using local provenance seed can depend on the target species, the degree of fragmentation of the landscape and the genetic quality of the available local seed. Williams (nd), a professional native seed harvester and merchant, is critical what he sees as an overly-simplistic emphasis on local provenance by government-funded natural resource management agencies and contrasts this to the approach taken by mine site rehabilitation specialists. He refers to a 'fundamentalist' attitude promoted by Florabank and Greening Australia such as the 'maximum permissible seed collection distances' and highlights the significant restrictions on seed supply that rigorous approaches to local provenance would create. Broadhurst et al (2006) express concern about the risks of collecting seed from a small number of remnant stands and warn that 'the quality of seed from remnant vegetation in

degraded landscapes is compromising revegetation efforts', highlighting the need to critically evaluate the quality of seed sources. Whalley et al (2013) argue that the local provenance protocols which may be applicable to cross-pollinated woody plants do not apply to native grasses and refer to 'clear evidence that distinct adaptive advantages may be gained by sourcing non-local provenance seed, which is matched to the environment of the revegetation site... to increase the genetic diversity of seed sources' (Ibid p.155).

On the other hand, the genetic studies of coastal *Acacia* species undertaken by Krauss & Hua He (2006) highlighted the importance of provenance, leading them to suggest that 'a narrow seed collection zone should be applied to these species for the conservation of genetic diversity and natural patterns of population genetic structure'. Byrne et al (2011) point to the risks of genetic change in local native plant populations posed by hybridisation facilitated by revegetation which they say can 'threaten population persistence and contribute to species extinction through genetic assimilation or demographic swamping'. In response to these risks they advance a 'genetic risk assessment protocol' for use in revegetation programs. Likewise Hufford et al (2016) point out that 'wide mixing of provenances may result in ... lower fitness of introduced plants, or outbreeding depression as a result of cross-pollination among differently adapted genotypes', but also warn that genetic bottlenecks can result 'if seeds are collected from a limited number of sources'. Hufford et al (2016) used genetic testing to help define local provenance for ecological restoration in the southwest of Western Australia – a region of high plant endemism – in an effort to understand both the spatial genetic structure and the scale of adaptive differentiation in focal species, and refer to a growing number of studies (Stingemore and Krauss 2013; Bower et al 2014; Dillon et al 2014) which are using 'genetic data to determine the scale of local adaptation and delineate species-specific seed provenance zones'.

From another perspective, it might be argued that human-mediated dispersal of culturally / economically important plants to Aboriginal people over millennia may have influenced their provenance ranges and that flood-mediated dispersal of riverine species (e.g. *Lomandra spp.*) could also impact their provenance

ranges. While it is clear that the value and importance of using local provenance seed and plants for landscape rehabilitation remains valid there are a number of complexities involved that should be an ongoing consideration for community nursery managers.

### **2.8.2 Landcare revegetation nurseries**

The volunteer-centred propagation nursery model seems to represent a dominant paradigm in Australia for the production of local provenance plants for revegetation and habitat restoration, and they are often the supplier of choice for revegetation project managers (Hawkesbury Nepean Catchment Management Authority 2007, p. 5). These community nurseries can be grouped into three categories, the NGO-run Landcare style revegetation nurseries, the Local Government run 'Bushcare' community nurseries and the Aboriginal community-run nurseries, which are typically (but not exclusively) located in remote areas of northern Australia.

Many Landcare revegetation nurseries were established to propagate local provenance native plants, both for Landcare revegetation projects and for sale to primary producers and the general public. Key drivers for this has been the difficulty sourcing a diverse range of local provenance plants from the commercial nursery sector, the high cost of plants from commercial nurseries and a desire to plant tube stock rather than the advanced stock favoured by commercial nurseries, which are significantly more expensive. It is reported that Landcare groups in Victoria have established 150 indigenous plant nurseries (Youl, Marriott & Nabben 2006), although many of these may be quite small and only grow plants for their own project needs, and I have been unable to establish how many of these still exist today.

Similarly, small-scale, site-specific, community-run native plant nurseries began springing up in the San Francisco Bay area from around 2002 with the aim of propagating local provenance plants for ecological restoration, and by 2010 twenty-six of these (with outputs ranging from 12,000 to 72,000 plants per annum) formed a network to foster collaboration and share knowledge on issues such as propagation techniques, seed collection, marketing, fund-raising and

volunteer programming (Serrill 2011). It is reported that all these community nurseries are dependent on volunteers and it is conservatively estimated that 3,000 volunteers are involved annually through this community nursery network.

Some of the bigger Landcare nurseries in Australia have an annual plant production in the order of 100,000 plants per year (see Table 2), and the profits generated from nursery sales help subsidise the group’s educational and on-ground activities. Several of the Landcare nurseries in south-east Queensland have a long history of collaboration. The author was intimately involved with the establishment and development of the Gympie & District Landcare nursery in the decade from 1997 to 2007 and collaborated closely with the Noosa & District Landcare and Barung (Maleny) Landcare nurseries during this time. This historic collaboration was extended recently through the agency of the Queensland peak body for NRM volunteers, Queensland Water and Land Carers (QWaLC), which facilitated an April 2016 forum hosted by Noosa and District Landcare, bringing together representatives from ten community revegetation nurseries from Townsville, Rockhampton, Gayndah, Fraser Coast, Tin Can Bay, Gympie, Noosa, Coolum and Brisbane, to share their knowledge and experience on topics extending from irrigation, stock control, legislation regarding propagation of endangered species and supporting volunteers (QWaLC 2016). Collaboration of this kind demonstrates the growing maturity and strength of the Landcare community nursery network in Queensland.

Table 2 below is a non-exhaustive list of revegetation nurseries run by Landcare groups, catchment protection groups, environment and ‘Friends of’ groups which was compiled by the author through an extensive internet search. Note that this would not pick up the many small Landcare nurseries that don’t have an internet profile and/or don’t produce plants for sale. The table provides the names and locations of the nurseries, additional details and website links.

**Table 2: Landcare / revegetation nurseries**

Source: web search of Landcare nurseries in Australia conducted January/ February 2017

<b>Group / Nursery Name</b>	<b>Location</b>	<b>State</b>	<b>Details</b>	<b>website</b>
Weddin Community Native Nursery	Grenfell	NSW	Opening Hours: 9.00 - 12 noon Monday to Friday	<a href="http://www.weddinnativenursery.com/">http://www.weddinnativenursery.com/</a>

<b>Group / Nursery Name</b>	<b>Location</b>	<b>State</b>	<b>Details</b>	<b>website</b>
Riverina Highlands Landcare Nursery	Tumut	NSW	Opening times vary; 80,000+ plants/year	<a href="http://www.riverinahighlandslandcare.com.au/landcare-nursery/">http://www.riverinahighlandslandcare.com.au/landcare-nursery/</a>
Port Macquarie Landcare Community Nursery	Port Macquarie	NSW	Mondays 9.00 – 12.00	<a href="http://www.landcareportmac.com.au/plant_list.php">http://www.landcareportmac.com.au/plant_list.php</a>
Barung Landcare Association	North Maleny	Qld	Porters Lane Nursery (retail) Wed, Thur, Fri 9:00 - 3:00 Sat 9:00 - 12:00	<a href="http://www.barunglandcare.org.au/nursery">http://www.barunglandcare.org.au/nursery</a>
Barung Landcare Association	Landsborough	Qld	Wholesale Production Nursery ( <i>appointment only</i> ) ~ 100,000/yr	<a href="http://www.barunglandcare.org.au/page-1167256">http://www.barunglandcare.org.au/page-1167256</a>
Noosa & District Landcare	Pomona	Qld	Retail Nursery: Wed – Fri 9.30 - 2.30; Sat 9.00 – 12.00 Riparian (prod ~70,000/yr)	<a href="https://noosalandcare.org/planet-sales/">https://noosalandcare.org/planet-sales/</a>
Gympie & District Landcare	Gympie	Qld	Wed - Fri 8.30 - 3.30; Sat 9:00 - 1.00; ~ 52,000/yr	<a href="https://gympielandcare.org.au/nursery-plant-sales/">https://gympielandcare.org.au/nursery-plant-sales/</a>
Coolum Community Native Nursery (Coolum District Coast Care Group & Maroochy Waterwatch)	Yaroomba	Qld	Tues- Fri 7.30-3.30 Sat 8.30-12.30	<a href="http://coolumnatives.com/worpress/">http://coolumnatives.com/worpress/</a>
Lower Burdekin Landcare Nursery	Ayr	Qld	Wed 8.00-11.30; 9.00-11.30 1st Sat each month	<a href="http://www.lowerburdekinlandcare.org.au/Nursery.aspx">http://www.lowerburdekinlandcare.org.au/Nursery.aspx</a>
Bulimba Creek Catchment Coordinating Committee Nursery	Carindale	Qld	Tues & Wed 7:30 – 2.00 Fri 7:30-12.00 First Sat /month 9.00 - 12.00	<a href="http://bulimbacreek.org.au/nursery/">http://bulimbacreek.org.au/nursery/</a>
Bundaberg Landcare Native Plant Nursery	Norville, Bundaberg	Qld	Wed - Fri 10.00 – 3.00	<a href="http://www.brisbanecatchments.org.au/bundaberg-landcare-native-plant-nursery">http://www.brisbanecatchments.org.au/bundaberg-landcare-native-plant-nursery</a>
Bribie Island Community Nursery	Bribie Island	Qld	Mon-Fri 8.00- 11:00	<a href="http://www.brisbanecatchments.org.au/bribie-island-community-nursery">http://www.brisbanecatchments.org.au/bribie-island-community-nursery</a>
Caboorture Region Environmental Education Centre (CREEC) Nursery	Burpengary	Qld	Mon, Wed & Fri 7.00 – 3.00	<a href="http://www.creec.org.au/nursery">http://www.creec.org.au/nursery</a>
Florabunda Bushcare community nursery / Petrie Creek Catchment Care Group	Woombye	Qld	Opening times vary;	<a href="http://www.florabundabushcare.org.au/index.php">http://www.florabundabushcare.org.au/index.php</a>
Gin Gin Landcare Native Plant Nursery	Gin Gin	Qld	Wed & Fri 8.00 – 4.00	<a href="http://www.brisbanecatchments.org.au/gin-gin-landcare-native-plant-nursery">http://www.brisbanecatchments.org.au/gin-gin-landcare-native-plant-nursery</a>
Moggill Creek Catchment Group Nursery	Brookfield	Qld	first and third Mon / month 9.00 – 12.00	<a href="http://www.moggillcreek.org/volunteering-with-mccg">http://www.moggillcreek.org/volunteering-with-mccg</a>
Sarina Community Native Plant Nursery	Sarina	Qld	Tues - Fri 8:30 - 4:30	<a href="http://www.sarinalandcare.org.au/sarina/index.html">http://www.sarinalandcare.org.au/sarina/index.html</a>
SOWN Nursery (Save Our Waterways Now)	The Gap	Qld	Wed 8:30 - 12:30 Sat 9.00 – 11.00	<a href="http://www.saveourwaterwaysnow.com.au/01_cms/details.asp?ID=59">http://www.saveourwaterwaysnow.com.au/01_cms/details.asp?ID=59</a>
Oxley Creek Catchment Association	Coopers Plains	Qld	Thur 10.00- 12.00	<a href="http://www.oxleycreekcatchment.org.au/community-native-">http://www.oxleycreekcatchment.org.au/community-native-</a>



Group / Nursery Name	Location	State	Details	website
				<a href="#">plant-nursery/</a>
Hindmarsh Island Landcare Group		SA	40,000 + plants/year	<a href="http://communitynurseries.com.au/nurseries/hindmarsh-island-landcare-group/">http://communitynurseries.com.au/nurseries/hindmarsh-island-landcare-group/</a>
Finniss Catchment Group Community Nursery	Meningie	SA	15,000 plants/year	<a href="http://communitynurseries.com.au/nurseries/finniss-catchment-group-community-nursery/">http://communitynurseries.com.au/nurseries/finniss-catchment-group-community-nursery/</a>
Shoreline Community Nursery	Milang	SA	Mon & Tues 9.00 - 4.30; 60,000 + plants/year	<a href="http://communitynurseries.com.au/nurseries/milangnursery/">http://communitynurseries.com.au/nurseries/milangnursery/</a>
Clayton Bay Community Nursery	Clayton Bay	SA	Tuesday & Thursday	<a href="http://communitynurseries.com.au/nurseries/clayton-bay-nursery/">http://communitynurseries.com.au/nurseries/clayton-bay-nursery/</a>
Ngopamuldi Nursery (Ngopamuldi Aboriginal Corporation)	Raukkan	SA	50,000 plants/year	<a href="http://communitynurseries.com.au/nurseries/ngopamuldi-nursery/">http://communitynurseries.com.au/nurseries/ngopamuldi-nursery/</a>
Kersbrook Landcare Indigenous Nursery	South Para	SA	50,000+ plants/year	<a href="http://www.communitywebs.org/kg/">http://www.communitywebs.org/kg/</a>
Bellarine Landcare Indigenous Nursery	Drysdale	Vic	Mon & Tues 9.00-3.00	<a href="http://www.bellarinelandcare.org.au/index.php/blg-activities/bellarine-indigenous-nursery">http://www.bellarinelandcare.org.au/index.php/blg-activities/bellarine-indigenous-nursery</a>
Friends of Warrandyte State Park	Warrandyte	Vic	Thur 9:30- 12:30; first Sat / month 9.00-1.00 (Apr-Oct); first Sun / month, 2.00-4.00 (Apr-Oct)	<a href="http://fowsp.org.au/nursery.php">http://fowsp.org.au/nursery.php</a>
Geographe Community Landcare Nursery	Busselton	WA	Mon & Tues 8.00-4.00; Wed – Fri 9.00-2.00	<a href="http://www.geographeplants.com/about.html">http://www.geographeplants.com/about.html</a>

### 2.8.3 Aboriginal revegetation nurseries

With support from the Caring for Country and Working on Country programs various Aboriginal Ranger Programs have established revegetation nurseries to assist with rehabilitation of traditional lands and to grow bush food and traditional medicine plants for planting in communities, around schools and clinics. This is consistent with the concept of a *culture and conservation economies* for Indigenous communities across northern Australia, which identified the establishment of native plant nurseries as one of the new Indigenous enterprises that could be developed to provide Indigenous employment opportunities throughout northern Australia (Hill et al 2008).

The North Australian Indigenous Land and Sea Management Alliance also argue that the evolution of culture-based economies builds on contemporary Indigenous culture, knowledge and connection to country and ‘supports their ongoing maintenance whilst creating genuine opportunities for employment, income and business development’ (NAILSMA, 2012). Support for the

development of a 'nursery industry' was also identified in 2004 by traditional owners in the Burdekin Dry Tropics Region of Queensland (Smyth, Szabo & George 2004). Wilson, Pickering and Kay (cited in Weir, Stacey & Youngentob 2011, p. 22) point out that:

harvesting and cultivation of bushfoods ... can help propagate and re-establish these species in areas where they might otherwise be out-competed or over predated by exotic species ... (and) provide local provenance plants for environmental restoration works.

Among the Aboriginal ranger groups in the Northern Territory that have established plant propagation nurseries are the Djelk rangers in Maningrida and Yirralka Rangers in Yirralka. The focus of these nurseries is: growing local and garden plants for the community and for sale; growing food plants, including bush tucker; growing plants to show school children; planting around communities; planting bush medicine near clinics for local use; learning how to grow different types of plants from seed and cuttings; seed collecting and collecting bush tucker for ourselves and the community (CAEPR 2012b).

The Yirralka Miyalk rangers expressed their nursery work as:

We learn about different plants, collect seeds, bush plants and bush foods ... how to plant, propagate, pot up and make good potting mix. ... We have been planting bush medicine plants around clinics in the homelands and learnt about landscaping. We want to take tourists around to see our bush plants and how we use them. (Ibid, p. 18)

These nurseries also provide a mechanism for the implementation Article 24 of the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP 2007). The Dambimangari native title group whose traditional land spans 16,040 km<sup>2</sup> on the Kimberley coast, identified a strategic goal was to develop a plant nursery to assist them 'teach the young ones the names and uses of rare plants so our knowledge is not lost' (Dambimangari Aboriginal Corporation 2012). The Gooniyandi native title group whose traditional country covers over a million hectares of the central Kimberley east of Fitzroy Crossing are also focused on developing a revegetation nursery. The Gooniyandi Healthy Country Plan

(Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015) lists 'develop and maintain a nursery on Gooniyandi country to supply plants for revegetation and commercial sale' among its operational capacity-building strategies. Traditional owner, Anthony Dawson, stated 'Seed collection is needed to revegetate bush tucker/ bush medicine plants around communities as they are hard to find near communities when they are needed' (Ibid, p. 16)

The federal government's Green Army program provided a new avenue for the engagement of Aboriginal youth in projects to protect their natural and cultural heritage (Australian Government 2014) and the Kimberley Land Council took on 30 Green Army participants as casual rangers, half of them women (KLC 2017). One remote Kimberley Aboriginal community, Jarlmadangah Burru Aboriginal Community (JBAC), used Green Army teams to construct a revegetation nursery to further their aspirations to rehabilitate degraded areas of their native title lands along the National Heritage listed Fitzroy River frontage, and to enhance the distribution and abundance of culturally important bush foods and medicine plants (Marshall 2016).

These Aboriginal community nurseries are reliant on a considerable volunteer in-kind contribution from elders engaged in the intergenerational transfer of Traditional Ecological Knowledge (TEK) relating to bush food and medicine plants, their names, distribution patterns, uses, preparation, flowering and seeding times, seed collection and propagation. Unfortunately, discontinuation of the Green Army program has disrupted the efforts by remote Aboriginal communities to develop a capacity to rehabilitate degraded areas of their traditional country (Coorey 2016, KLC 2017).

It should be noted that not all Aboriginal plant nurseries are located in northern Australia or in remote Aboriginal communities. One example of this is the plant propagation nursery near Kilkivan run by Aboriginal elder Eugene Bargo, which has propagated and planted over 100,000 native plants (SBS: Surviving 2016, Bargo E, pers. comm., 1/7/16). Another example is Muru Mittigar Provenance Nursery, located in Castlereagh in Western Sydney, which specialises in Western Sydney provenance and Cumberland Plain species (Muru Mittigar 2015).

#### **2.8.4 Local government community nurseries**

The drivers for the establishment of community nurseries by NSW local government agencies (LGAs) include legislation, policies and protocols, and grant funding conditions, which have been developed and implemented to maximise biodiversity conservation at the local and regional level. The *National Parks and Wildlife Act 1974* (NSW), stipulates that revegetation work within or adjacent to Endangered Ecological Communities (EECs) requires a Section 132C Scientific Licence issued by the Department of Environment and Heritage. A Section 132C licence is also required for seed collection from threatened species, endangered populations and for seed collection within EECs. Typically a S132C license will specify the approved activities (such as ‘conduct bush regeneration activities, collect seed from protected plants for revegetation purposes, excluding individually listed threatened species’), the approved collection area (such as ‘non-NPWS estate within a specified LGA area’), list the EECs that can be collected from, stipulate licence conditions (such as ‘should follow best practice guidelines’), list the persons approved under the license and specify annual reporting requirements. The use of local provenance plants for revegetation projects is generally stipulated by natural resource management (NRM) agencies and various federal and state NRM grant programs.

A specification by Warringah Council in Sydney, that plants used in landscaping a development had to be grown from local provenance native seed or cuttings to ensure compliance with Council’s Local Habitat Strategy, was challenged but ultimately upheld in the Land and Environment Court in 2009, providing a legal basis for other LGAs to adopt a similar specification (Bates & Meares 2010). The Hawkesbury Nepean Catchment Management Authority in its *Local Provenance Plant and Seed Strategy* reported that it specifies in its funding agreements that ‘local provenance plants’ must be used in all revegetation projects (Hawkesbury-Nepean Catchment Management Authority 2007, p.8). Similarly the NSW Environmental Trust’s Restoration and Rehabilitation Program grant application guidelines outline the principles that must be followed in funded revegetation projects, including to ‘ensure appropriate sourcing of plants and/or seed stock to maintain genetic diversity’ (NSW Environmental Trust 2016).

The role of community nurseries/ revegetation nurseries in the supply of local provenance plants has become increasingly important, and engaging community volunteers in the propagation of local provenance plants, the 'best practice' collection and storage of local provenance seed, and the data tracking of seed batches from collection through to supply and planting, is vital to achieving the desired biodiversity outcomes. However, a range of barriers are currently limiting the capacity of community nurseries to deliver biodiversity outcomes. A survey of the 15 LGA's in the Hawkesbury-Nepean catchment area indicated that most Bushcare coordinators sourced the plants they needed for revegetation projects from community or council nurseries. However some Bushcare coordinators had no choice but to rely on commercial nurseries and they were actively seeking to establish community nurseries within their shires (Hawkesbury-Nepean Catchment Management Authority 2007, p. 17). The Landcare groups surveyed by HNCMA reported that they preferred to source plants for revegetation projects from community nurseries rather than commercial nurseries, and that more than 80% of the plants they used were supplied by community nurseries. The HNCMA reported that it expected the demand for local provenance plants would continue to increase.

## **3 METHODOLOGY**

### **3.1 Background**

The focus of this research is on the local government community nursery sector, and the volunteers who provide the crucial labour force in these nurseries, without which the community nurseries could not function. It draws on the perspectives of the Council Environment Branch managers, the community nursery coordinators and the community nursery volunteers themselves.

The local government sector community nurseries are quite varied in their size, capacity, staffing, length of establishment and the extent of volunteer engagement. In order to understand the context and capacity of these community nurseries – including background on their establishment, how they mesh with and deliver on a council's policies, the level of support they receive from their host council, their operational capacity, focus on biodiversity and local provenance, their engagement of volunteers, and related matters – three community nurseries were selected for detailed case study. It is beyond the scope of this research to examine the characteristics and motivations of community volunteers in the Landcare-run and Aboriginal community-run native plant propagation nurseries, but these are also worthy of further study.

My extensive personal experience as a natural resource manager within the Landcare and integrated catchment management sector at local, state and national levels spanning a 25 year period, which has included capacity building and volunteer engagement in Landcare revegetation nurseries, council community nurseries and in Indigenous NRM nurseries provides me with considerable background knowledge and understanding of their social / cultural context. Along with five years' experience in the local government sector as a Natural Resource Officer supporting Bushcare volunteers and biodiversity programs, this has helped inform the approach used in this thesis research.

#### Comparative case studies

Newing (2011) indicates that comparative case study is a very valuable research method since 'rather than simply describing results for a single case you can compare the results for different cases, which gives plenty of scope for analysis

and interpretation'. She recommends choosing cases that are 'as alike as possible' and although it will not be possible to find identical matches she recommends researchers do the best they can and 'discuss the implications of any differences' in their report. Newing points out that the objective of comparative case study design is 'describing similarities and differences' and then discussing possible interpretations. She describes this as 'a powerful option in field research'. Wild River (2005) also argues the value of comparative case studies to explain local government sustainability work across different contexts.

#### Application of comparative case study approach

I chose to use a comparative case study methodology to compare three community nurseries - an urban community nursery, a peri-urban community nursery and a rural/regional community nursery to cover the breadth of settings in which community nurseries operate. In an effort to limit any disparity resulting from different regional policy settings, all three community nurseries in the study are located within the same Catchment Management Authority region, and have operated under a consistent regional support framework provided by the Hawkesbury Nepean Catchment Management Authority.<sup>2</sup> As well as comparing the policy context, support structures, and operational characteristics of the three community nurseries the study also sought to analyse their community engagement and capacity building strategies, the strength of their volunteer base, the volunteer's perceptions of how well they are supported, and to analyse any technical, social and institutional barriers that may be impeding their delivery of biodiversity outcomes.

The research examined these community nurseries from three different perspectives: the perspective of the manager of the environment/sustainability branch/division of council, as the local government manager with key responsibilities for the nursery budget and responsible for reporting to the executive; the perspective of the nursery manager/coordinator as the person responsible for the day to day operations of the community nursery and

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<sup>2</sup> Note that with the departmental restructure in early 2016 which merged the CMAs with the Soil Conservation Service and biosecurity agency these community nurseries are now split between the South East Local Land Service and the Sydney Metropolitan Local Land Service areas.

volunteer management; and the perspective of the nursery volunteers themselves without whom the community nursery could not operate.

### Mixed method analysis and questionnaire design

A process often used in the field research is the mixed-method approach combining both qualitative and quantitative analysis. Some data, e.g. socio-demographic data, lends itself to quantitative analysis, while other types of data, e.g. on volunteer motivations, lends itself to a qualitative analysis. Newing (2011) indicates that some issues can be explored better using qualitative methods to yield 'in depth description and understanding' because they are 'better at taking the social and cultural context into consideration'.

Petriwskyj & Warburton (2007) also state that 'the use of both qualitative and quantitative methods can be seen as a strength for a research field, bringing richness through triangulation of the findings'. The mixed-method approach provides 'the ability to design a single research study that answers questions about both the complex nature of phenomenon from the participant's perspective and the relationship between measurable variables' (Williams, p. 70). He argues that a mixed-method approach is useful for addressing 'research questions requiring both numerical and textural data, that is, a quantitative approach that responds to research questions requiring numerical data and a qualitative approach for research questions requiring textural data'.

Newing (2011, p. 55) emphasises that practical considerations need to be taken into account and that 'research design involves constant compromise between theoretical ideals and practical considerations' and where the research involves a small number of individuals (less than 80) 'qualitative interviews are usually appropriate'. Newing indicates that questionnaires are the 'most widely used social science method in conservation' as they are quick to administer and allow for anonymity, but also states that designing a valid questionnaire is complex, as the questions need to be unambiguous, be consistently understood by the respondents, and involve matters they are willing to answer. While closed checklists are an appropriate way to collect social-demographic data (age, gender, employment status) open-ended questions provide the opportunity to



gather greater detail in the form of descriptive answers, ascertain the reasons behind particular viewpoints or behaviours and learn more about complex situations. A non-probability sampling approaches described by Newing is the 'targeted sampling' or 'purposive sampling' method, which involves a researcher intentionally selecting those 'who are most relevant to study', but suggests that researchers 'require good knowledge about the background and social and cultural context' of the research topic in order to design a valid questionnaire (Ibid p. 119). De Vaus (1991, p. 87) also provides guidance on the strengths and weaknesses of open and closed question formats and how these can be combined in a questionnaire. Both questioning modes are often used in conjunction, so that the open-ended questions can be used to complement the data obtained from closed questions.

#### Research approach and questionnaire design

The mixed-method approach was chosen for this thesis research with quantitative questioning used to yield demographic data on the volunteers and their extent of volunteering (e.g. years of volunteering, average number of hours per month, volunteering with other groups), while qualitative data was obtained through the use of an 'additional comments' field attached to many of the survey questions, as well as through interviews with the nursery managers, council branch managers and questionnaire respondents who indicated a willingness to participate in a telephone interview.

Due to the relatively small number of volunteers in the three community nurseries surveyed using a probability sampling approach was not considered appropriate, so the thesis research adopted a 'targeted sampling' method discussed by Newing (2011). The questionnaire design went through several iterations before being submitted for Ethics Committee approval along with the cover letter that outlined the aims of the research to the nursery volunteers. The privacy of the nursery volunteers was protected by using the nursery coordinators as an intermediary for the distribution of the surveys to their volunteers with a 'Post Paid' facility for the return of completed questionnaires. Further detail is provided on pages 62-64.

The research design for the case study and interview questions was also guided by Ryan et al (2001), Gooch (2003), Bruyere and Rappe (2007), Measham and Barnett (2008), Hay (2010), Randal and Dolnicar (2006, 2015), Rankin (2013) and Constable (2015) as discussed below.

### 3.1.1 What motivates conservation volunteers

Ryan et al (2001) used surveys to assess the relative importance of five motivational factors to long-term volunteers in environmental stewardship programs in Michigan. They distributed 310 4-page survey forms by mail with a cover letter and postage-paid return envelope to volunteers and 148 valid surveys were returned, a response rate of 48%. Their survey questions combined an open-ended format to ascertain the extent of volunteer activities and structured questions using a five-point scale to rate the five motivational factors used in their study: '**Learning**: the opportunity to learn new things about our environment; **Helping the environment**: the opportunity to do something good for the environment; **Social**: volunteering to meet new people or see old friends and family; **Reflection**: using the volunteer experience to reflect; and **Project organization**: having the opportunity to work for a program that is well organised and uses the volunteers' time efficiently'.

After reviewing the problems and limitations with sampling in past studies of volunteerism, Bruyere and Rappe (2007) concluded that there are established and viable theoretical and methodological approaches for studying volunteerism and assert the *functional approach* has been shown to be most reliable for studying volunteer motivations. The functional approach seeks to investigate the 'personal and social processes that initiate, direct and sustain action' on the basis that 'people volunteer for the same activity for different reasons'. Bruyere and Rappe report that Clary et al (1994) adopted the functional approach from Katz (1960) and refined it further, defining six factors in their Volunteer Functions Inventory. These were '**Understanding**: involving a sense of learning and/or the ability to use and develop new skills or abilities; **Social**: having the opportunity to participate with friends and do work that is looked at as important by the people who matter to the volunteers; **Values**: having the opportunity to put values into

action; **Protective**: using the volunteer opportunity to cope with inner conflicts and stresses or guilt; **Career**: using the volunteer experience to build career experience; and **Enhancement**: working on psychological development and building personal esteem’.

An investigation into the motivations of volunteers working on the rehabilitation of Rodley Nature Reserve by Constable (2015) was strongly influenced by the concept of Cultural Ecosystem Services – the recreational, aesthetic pleasure, well-being, social capital, identity, creativity, health and spirituality values of ecosystems – that came out of the 2005 United Nations Millennium Ecosystem Assessment (Corvalán, cited in Constable 2015, p. 7). Her research strategy involved participant observation and open-ended interviews with the volunteers to identify the significance of five motivational themes. **Meaningful contribution**: helping the environment / leaving a legacy / stewardship / acknowledgement of effort; **Autonomy**: the personal benefit from an environment of flexibility, choice, freedom and trust; **Self-efficacy, both individual and collaborative**: seeing that one’s actions are making a difference; **Well-being**: improved personal health and ‘life satisfaction’ / reduced mental fatigue / therapeutic value; and **Social**: camaraderie / a sense of community / increased confidence and personal development / improved personal dignity or intrinsic worth / attachment to place.

Bruyere and Rappe’s ‘*understanding*’ corresponds with the ‘*learning*’ factor used by Ryan et al. The ‘*reflection*’ factor used by Ryan et al and has some alignment with the ‘*protective*’ motivational factor used by Bruyere and Rappe and the ‘*well-being*’ factor used by Constable. All of the researchers use a ‘*social*’ motivational factor. The ‘*helping the environment*’ factor used by Ryan et al corresponds to Constable’s ‘*meaningful contribution*’ and ‘*self-efficacy*’ factors and with the more general ‘*values*’ factor used by Bruyere and Rappe. The ‘*enhancement*’ factor used by Bruyere and Rappe seems to loosely correlate with Constable’s ‘*autonomy*’ factor but contains elements of her ‘*social*’ factor. Ryan et al also assessed ‘*project organisation*’ as a motivational factor and Bruyere and Rappe’s survey assessed ‘*career*’ experience as a motivation.

Bruyere and Rappe (2007) reviewed nine other studies that tested the validity of the functional approach and open-ended probes of the motivations behind volunteering and found that the Volunteer Functions Inventory was 'easiest to administer and score', and that 'overall, the Volunteer Functions Inventory is the most widely used approach for studying and understanding motivations for volunteerism'. However, they also found that research using the functional approach to understand the motivations of volunteers within the environmental and natural resource realms is limited with a small number of studies having applied the functional approach to research volunteer motivations within the natural resource management sector.

In their application of the Volunteer Functions Inventory approach, Bruyere and Rappe (2007) used both mail-back and on-site data collection to survey volunteers working with five organisations representing 'a conservation or land management mission'. The mail-back survey used a 65-item self-report survey in which respondents were asked to rate the importance of 37 statements on a seven-point Likert scale of 'strongly important' to 'strongly unimportant'. The other survey items addressed demographic information and frequency of volunteerism. Also included were a number of open-ended questions which aimed to identify motivations that could not be drawn out with the quantitative survey items. This resulted in a sample of 282 completed surveys which were supplemented by on-site surveys of 119 volunteers working with a sixth not-for-profit conservation organisation providing a total of 401 valid surveys to analyse. Bruyere and Rappe used the Statistical Package for the Social Sciences (SPSS) to analyse their quantitative data and used Principle Components Analysis (PCA) with a varimax rotation to identify motivation categories and maximize the independence of factors.

Randal and Dolnicar (2006) used a permission-based internet panel survey to test the assumption that environmental volunteers who display pro-environmental attitudes also engage in other environmentally responsible behaviours. The respondents in their survey were drawn randomly from a total panel selected to be representative of the Australian population and invited to complete a 30-minute online questionnaire, which remained available online until it had been

completed by 1,000 respondents, which took four days. They then profiled the attitudes and behaviours of the respondents from a statistical analysis of their responses to questions on the frequency of environmental volunteering, levels of altruism, environmental attitudes and various environmental behaviours, along with socio-demographic questions.

Hornsby Shire Council (2009) conducted research on Hornsby Bushcare volunteers by sending out a survey to 940 volunteers of whom 263 returned completed surveys, a 28% response rate. The Hornsby Council survey covered factors such as length of time volunteering, frequency of volunteering in the Bushcare program or the Hornsby community nursery, workshop participation, motivational factors, their perception of the level of council support and suggestions for improvement. The motivational factors included 'what do you enjoy most about Bushcare' and 'what motivates you to keep going /what do you personally gain from your volunteering?' Survey results were expressed as percentages of the number of people that selected each option.

The research conducted by Gooch (2003) used semi-structured interviews with both individual volunteers, and group interviews with participants involved in Landcare, Bushcare, Coastcare, Waterwatch, ICM and similar groups located along the Queensland coast (26 interviews, 85 participants) to explore questions such as: 'what benefits accrue to volunteers, their communities and to local natural resources? What barriers do volunteers face? What actions do volunteers undertake to overcome problems and tackle new issues?' Measham and Barnett (2008) also used interviews with individual volunteers (N=32) involved with an urban environmental group in metropolitan Sydney and a peri-urban environmental group near Melbourne, as part of a pilot study 'to develop and refine the categories of volunteer motivations and modes of volunteering'. A second stage of the pilot study used two focus groups involving 'volunteer group members who did not take part in the first stage of interviews' in order to explore the themes that came out of the interview in more depth and assist in the design of a survey on volunteer motivations.

Research undertaken by Buizer, Kurz and Ruthrof (2012) aimed to ascertain how volunteers' perceptions about past and present ecological landscapes affected their restoration activities, and used detailed (1.5-2.5 hour) semi-structured interviews with two groups of ecosystem restoration volunteers, combined with observations made at 15 field activities in which the participants were observed while they undertook their normal activities, roughly half of which involved their participation in science-based restoration trials. In addition Buizer, Kurz and Ruthrof (2012) conducted two group discussions in which the volunteers were encouraged to speak broadly about their activities, about the future of ecological restoration and, in particular, about their own agency in ecological restoration (Ibid, p. 155).

Rankin (2013) used a 'mixed-mode survey to examine volunteer perceptions, motivations, social interactions, and the experiences and knowledge' of community volunteers engaged in the Bushcare program within the Shoalhaven local government area. Rankin used the Shoalhaven City Council Bushcare database to send out, by email and post, a survey to 612 people volunteering with one or more of the 65 Bushcare and related groups active in the Shoalhaven LGA, and received 197 completed survey forms, a response rate of 32%. Statistical analysis of the data was undertaken with the Statistical Package for the Social Sciences (SPSS) using analysis of variance and chi-squared tests for quantitative data; with qualitative data analysed using 'Wordle' content analysis of the word counts displayed in graphical form.

A study of *potential environmental volunteers* undertaken by Randle & Dolicar (2015) used questions on a 5-point Likert scale to identify the environmental attitudes, motivations and personal values of the 399 respondents they classified as potential environmental volunteers which were compared against 982 respondents classified as non-environmental volunteers. They used analysis of variance to compare means for metric variables and chi-square tests to identify whether *potential environmental volunteers* were significantly more likely to nominate 11 of the 18 motivations than non-environmental volunteers.

In the research for this thesis I adopted the Volunteer Functions Inventory approach of Ryan et al (2001) and Bruyere & Rappe (2007), which I adapted to suit the community nursery context, with its particular focus on growing local provenance plants for landscape rehabilitation and biodiversity conservation. In this regard the *learning* motivation was expressed as 'gaining indigenous plant knowledge', the 'opportunity to learn new skills' and 'gaining propagation skills', and was further teased out through a question on the areas of skills training of greatest interest to the volunteers. The *helping the environment* motivation was expressed as 'helping the environment' and 'helping conserve biodiversity'; the *social* motivation expressed as 'enjoy the social aspect', 'enjoy the social interaction' and 'the opportunity to teach others'; while the *reflection* motivation was expressed as the motivation 'enjoy growing plants'. The *project organisation* motivation used by Ryan et al (2001) and Bruyere & Rappe (2007), which relates to the 'opportunity to work for a program that is well organized and uses the volunteers' time efficiently' was captured in questions on their satisfaction with the nursery volunteer experience, how this experience compares with other volunteer experiences they may have had and how highly they feel their volunteer contribution in the nursery is valued.

Rather than the 7-point Likert scale used by Bruyere and Rappe (2007) the questionnaire used a 5-point Likert rating scale with some questions employing a battery of 5-point Likert rating scales, in combination with open-ended questions where the respondents were encouraged to provide additional comments expanding on their response. In questions where the volunteers were asked to rate the various factors on a battery of Likert scales the respondents did not always provide a rating for all items listed in the battery of factors, so the analysis used an average score, derived from the sum of the individual scores out of five divided by the number of volunteers who responded to the question. The sample size was not sufficient to carry out a statistical analysis, such as the ANOVA or chi-squared tests used by Rankin (2013) and Randle & Dolicar (2015), so instead the data was graphed and the graphs interpreted for the relative significance of each factor.

In the section on reasons for volunteering the volunteers were asked 'what attracts you to volunteering at the community nursery' and 'what do you personally gain from volunteering' with choices covering: helping the environment/ helping conserve biodiversity; gaining indigenous plant knowledge/ gaining propagation skills/ learning new skills; enjoy the social aspect/ enjoy the social interaction/ opportunity to teach others; enjoy growing plants; and 'other' with the opportunity to provide further comments.

To address the issue of the study's rigour due to low sample sizes, telephone interviews were used to compliment the qualitative data gathered in the open-ended 'further comments' section of the questionnaires. The information derived from these interviews was tabulated and referred to in the discussion and analysis. Semi-structured interviews have been used by Gooch (2003), Measham and Barnett (2008) and Buizer, Kurz and Ruthrof (2012) to explore the motivations, barriers and perceptions of environmental volunteers. The interviews conducted for the thesis research provided many insights into the motivations and barriers faced the community nursery volunteers and their perceptions of their agency in addressing biodiversity loss.

Ryan et al (2001), Bruyere and Rappe (2007) and Constable (2015) all found that making a meaningful contribution to helping the environment by effectively putting one's values into action were strong motivational factors to environmental volunteers. This thesis research tested the how strongly the volunteers were influenced by the motivation of taking effective action to help preserve biodiversity through propagation of local provenance plants, and explored the volunteer's awareness of biodiversity conservation issues and their perception of the extent to which their volunteering in the community nursery was making a meaningful contribution. In addition to collecting data on volunteer demographics and the other motivational questions listed above, the volunteer survey questions focused on volunteer perceptions of:

- their contribution to biodiversity conservation / landscape rehabilitation;
- the extent to which they feel their contribution is valued;



- constraints on their volunteering effort and factors that would encourage their increased participation in the nursery;
- whether they are an active volunteer in Bushcare or other on-ground biodiversity conservation programs;
- whether they volunteer for other (non-NRM focussed) community groups;
- their interest in training and a nominated set of training opportunities;
- how the personal dynamics within the volunteer workforce influences their satisfaction levels;
- the issue of biodiversity loss and their level of concern about this;
- the general level of Council support for their community nursery and for biodiversity conservation.

While the responses to some of these questions (e.g. those relating to perceptions of the support or performance of their host council) are not amenable to generalisation many of the responses relating to motivations, interests, perceptions and barriers to volunteering are likely to apply across the community nursery sector, and could help inform other community nursery coordinators and council's considering establishing a community nursery.

The survey questions asked of nursery volunteers are reproduced in [Appendix 1: Community Nursery Volunteer Questionnaire](#) along with the cover letter [Appendix 2: Cover letter to Nursery Volunteer Questionnaire](#). In addition telephone interviews with several nursery volunteers who volunteered for more in-depth questioning using a semi-structured format were conducted as a follow-up ([Appendix 3: Telephone interview questions](#)). In order to preserve the confidentiality of volunteer lists and anonymity of the respondents, the community nursery volunteer questionnaire and cover letter was provided to the nursery coordinators who distributed them to their nursery volunteers. Those volunteers who chose to participate in the survey returned them by reply paid post via the University of Wollongong. A separate form was included with the survey form and letter which could be returned by separate reply paid post by nursery volunteers who were willing to participate in a telephone interview expanding on the questions in the questionnaire. From this seven of the volunteers chose to be interviewed by phone. The responses are tabulated in

Appendix 4: Summary of volunteer telephone responses while their full responses are reproduced in Appendix 5: Detailed volunteer telephone interview responses.

The research also involved a questionnaire supplied beforehand to the managers/ coordinators of the three selected community nurseries (Appendix 6: Community Nursery Manager/Coordinator Questionnaire) and conducted as semi-structured interview telephone interviews. The nursery manager/coordinator is generally a part-time employee of Council or a full-time employee who also has responsibilities relating to the council Bushcare program. They play a crucial role in the functioning of the nursery including volunteer recruitment, engagement, training and satisfaction levels. Interviews with the nursery managers/coordinators sought to ascertain and analyse the factors that limit operational outcomes and how these differ between Rural/Regional, Peri-Urban and Urban environments, volunteer engagement and the value placed on volunteers:

- Productive capacity of community nurseries – physical space, volunteer capacity, management support, and if their business model affects their production capacity;
- Provenance seed supply / diversity – seed supply strategies, seasonal variability in availability, diversity and viability and seed storage facilities;
- Volunteer capacity and engagement – volunteer numbers and hours contributed as well as changes over time, volunteer skills base, training needs, satisfaction and aspirations, and volunteer recruitment strategies;
- Demand management /growth – the impact of seasonal / annual demand fluctuations and how it is managed / grow-to-order versus opportunistic sales, effects of seed supply limitations;
- Management / organisational support – how their local managers perceive the role, operations and biodiversity conservation contribution of the community nursery and the likelihood of increased funding support in future.

Interviews were also conducted with branch managers of the Environmental/ Sustainability Branch of the three councils (Appendix 8: Environment & Sustainability branch manager's survey) to elucidate the level of council support for Natural Resource Management volunteer engagement programs in general and for their community nursery in particular. The survey responses and interview data have been stripped of identifying features to protect the anonymity of the respondents. No intellectual property or safety issues were identified, and the Ethics Committee agreed that this research was of low risk to the participants (Appendix 10: Ethics approval for research) with the time required to participate being the only impact.

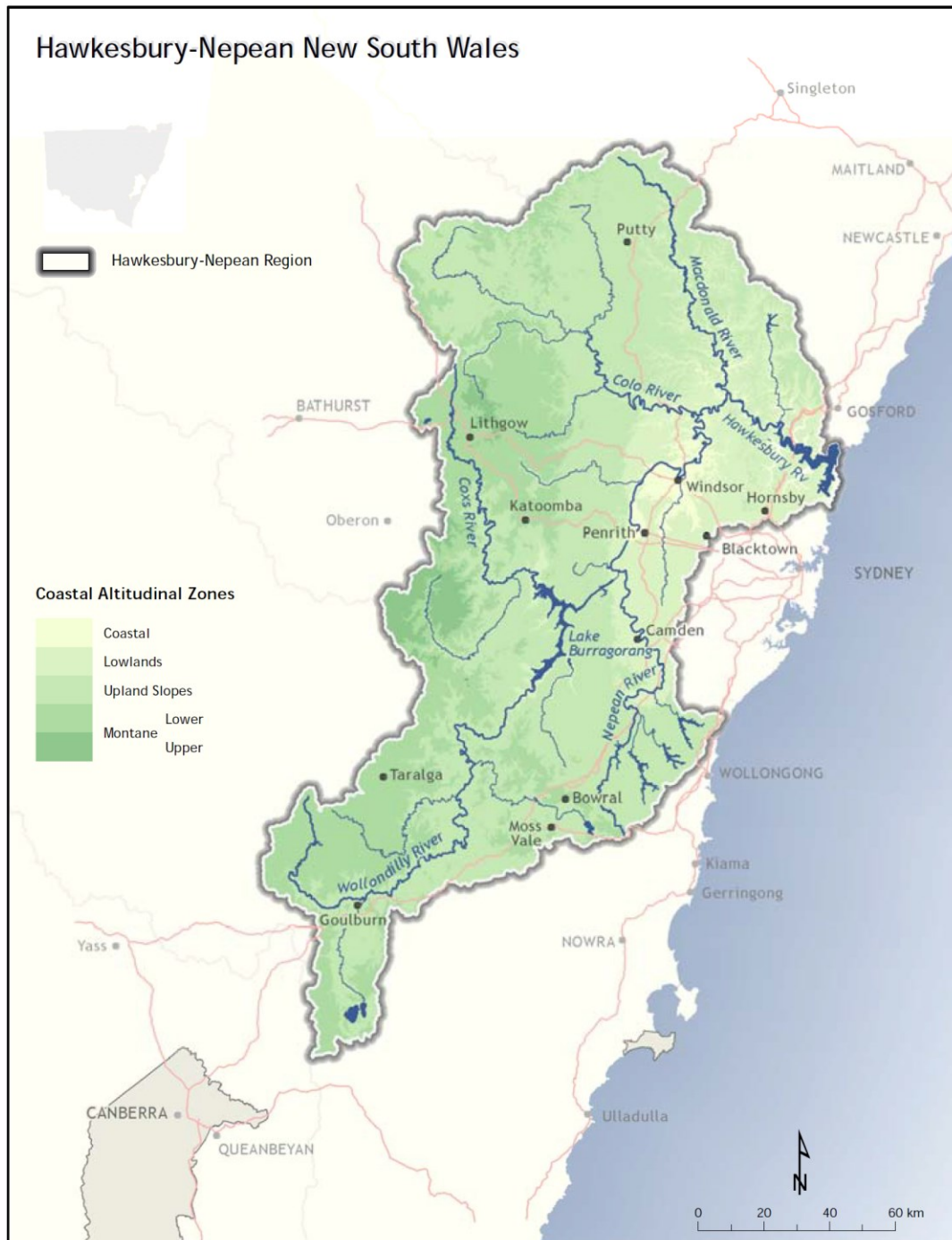
This methodology chapter has outlined the case study methodology used in this study. Case studies comprise three diverse community nurseries, one urban, one peri-urban and one rural, all located within the same CMA in the Hawkesbury region of NSW. The case studies all involve the collection of data from the perspective of three different stakeholder groups and these are used to 'triangulate' and validate the conclusions drawn from the surveys..

### **3.1.2 Research Study Area**

The geographical area of the research was selected so that the three community nurseries were in all in local government authority areas within the same Catchment Management Authority region, the Hawkesbury-Nepean which encircles metropolitan Sydney to the north, west and south-west (see map 1). The Catchment Management Authorities (CMAs) were established by the New South Wales government to act as overarching regional natural resource management agencies, driving regional NRM policy and planning, and devolved grants, until their recent incorporation into the Local Land Services structure. Selecting community nurseries that were all within the same CMA region reduced the potential influence of cross-regional variation in policy and funding arrangements. The community nurseries selected had different characteristics:

1. An urban council-run community nursery that has been operating for 10-15 years which has over 20 regular volunteers who contribute over 250 hours per month and produce over 40,000 plants per year.

2. A peri-urban council-run community nursery that has been operating over 15 years and has less than 15 regular volunteers who contribute over 200 hours per month and produce 30-40,000 plants per year.
3. A rural/regional council-run community nursery that has been operating less than 10 years and has 8 regular volunteers who contribute around 24 hours per month and produce around 10,000 plants per year.



**Map 1 Case study area: Hawkesbury Nepean region of New South Wales**

## 4 LOCAL GOVERNMENT COMMUNITY NURSERIES

### 4.1 Establishment of LGA community nurseries

A range of community not-for-profit groups operate revegetation/ community nurseries, including bodies such as Greening Australia, Landcare groups, Aboriginal groups and Australian Native Plant Societies, and many local government agencies also operate community nurseries with the objective of supplying local provenance plants for biodiversity conservation programs. Local government agencies generally do so as part of their Bushcare programs and to support native plant 'give-aways' to ratepayers, while for community not-for-profit groups, such as Landcare, their nurseries also provide an income stream and/or matching finance for grant funded revegetation projects.

#### 4.1.1 Background to LGA community nurseries

The LGAs in the Greater Sydney Region that operate community nurseries are listed in Table 3 below, was compiled from HNCMA (2007) and supplemented by the author's web search of the Local Government websites. These community nurseries vary widely in size, range of species, production capacity, and hours of operation, but they all have one thing in common – a strong focus on the engagement of volunteers in their operations. The case study nurseries were chosen to be generally representative of the Sydney region community nursery sector in that they span from the small to the large, from the rural/regional to the urban, encompass very part-time operations to those approaching full-time, and those that have operated for decades to those less than one decade old.

**Table 3: Community nurseries in Sydney and hinterland operated by LGAs**

Local Government Authority	Location	Website
Fairfield City (Native Community Nursery)	Fairfield	<a href="http://www.fairfieldcity.nsw.gov.au/info/20004/environment/172/environment_community_groups/4">http://www.fairfieldcity.nsw.gov.au/info/20004/environment/172/environment_community_groups/4</a>
Georges River Council (Native Nursery Group)	Mortdale	<a href="http://www.georgesriver.nsw.gov.au/Council/Volunteering">http://www.georgesriver.nsw.gov.au/Council/Volunteering</a>
Hawkesbury City Council	Mulgrave	<a href="http://www.hawkesbury.nsw.gov.au/services/places-and-facilities/community-nursery">http://www.hawkesbury.nsw.gov.au/services/places-and-facilities/community-nursery</a>
Hornsby Shire Council	Hornsby	<a href="http://www.hornsby.nsw.gov.au/environment/trees-plants-and-bushland/community-nursery">http://www.hornsby.nsw.gov.au/environment/trees-plants-and-bushland/community-nursery</a>

Local Government Authority	Location	Website
Inner West Council	Marrickville	<a href="https://www.innerwest.nsw.gov.au/environment/biodiversity/community-nurseries/marrickville-community-nursery">https://www.innerwest.nsw.gov.au/environment/biodiversity/community-nurseries/marrickville-community-nursery</a>
Inner West Council	Rozelle	<a href="https://www.innerwest.nsw.gov.au/environment/biodiversity/community-nurseries/rozelle-bay-community-nursery/rozelle-bay-community-nursery">https://www.innerwest.nsw.gov.au/environment/biodiversity/community-nurseries/rozelle-bay-community-nursery/rozelle-bay-community-nursery</a>
Ku-ring-gai Council (Wildflower Nursery)	St Ives	<a href="http://www.kmc.nsw.gov.au/Services_facilities/Facilities_and_venues/Gardens_and_nurseries/Ku-ring-gai_Nursery">http://www.kmc.nsw.gov.au/Services_facilities/Facilities_and_venues/Gardens_and_nurseries/Ku-ring-gai_Nursery</a>
Lane Cove Council	Lane Cove West	<a href="http://www.lanecove.nsw.gov.au/Environment/GetInvolvedandGreenEvents/Pages/CommunityNursery.aspx">http://www.lanecove.nsw.gov.au/Environment/GetInvolvedandGreenEvents/Pages/CommunityNursery.aspx</a>
Northern Beaches Council	Manly Dam	<a href="https://www.northernbeaches.nsw.gov.au/environment/bushcare">https://www.northernbeaches.nsw.gov.au/environment/bushcare</a>
Randwick City Council	Kingsford	<a href="http://www.randwick.nsw.gov.au/environment-and-sustainability/randwick-community-nursery/about-the-nursery">http://www.randwick.nsw.gov.au/environment-and-sustainability/randwick-community-nursery/about-the-nursery</a>
Rockdale City Council	Kogarah	<a href="http://www.rockdale.nsw.gov.au/Community_Services/Pages/Facilities_Nursery.aspx">http://www.rockdale.nsw.gov.au/Community_Services/Pages/Facilities_Nursery.aspx</a>
Sutherland Shire Council	Gymea	<a href="http://www.sutherlandshire.nsw.gov.au/Outdoors/Environment/Plants-and-Bushland/Plant-Nursery">http://www.sutherlandshire.nsw.gov.au/Outdoors/Environment/Plants-and-Bushland/Plant-Nursery</a>
The Hills Shire Council (Bidjiwong Community Nursery)	Baulkham Hills	<a href="http://www.thehills.nsw.gov.au/Services/Environmental-Management/Protecting-Our-Environment/Bidjiwong-Community-Nursery">http://www.thehills.nsw.gov.au/Services/Environmental-Management/Protecting-Our-Environment/Bidjiwong-Community-Nursery</a>
Wingecarribee Shire Council	Moss Vale	<a href="http://www.wsc.nsw.gov.au/environment/get-involved/bushcare">http://www.wsc.nsw.gov.au/environment/get-involved/bushcare</a>
Wollondilly Shire Council	Picton	<a href="http://www.wollondilly.nsw.gov.au/resident-services/environment-and-sustainability/wollondilly-community-nursery/">http://www.wollondilly.nsw.gov.au/resident-services/environment-and-sustainability/wollondilly-community-nursery/</a>

## 4.2 Council Environment Branch Manager Survey

### 4.2.1 Policies driving community nursery establishment

The Environment Branch Managers of the three councils were interviewed for background on the policies and funding levels for environment and sustainability initiatives, and to seek background on the factors that led to their council establishing a community nursery. They were also asked about support for continued funding of, and potential expansion of the community nursery. An analysis of their responses is given in section 4.2.2 below and their responses individual responses are tabulated in Table 4.

#### **4.2.2 Analysis of Environment Branch manager responses**

The responses revealed all the council Environment Branches had undergone a similar pattern of evolution, from an initial focus on enforcing environmental compliance towards a focus on environmental protection and enhancement. All three had adopted environment and sustainability policies around the same period, between 2008 and 2012. The evolving legislative framework governing Local Government environmental powers and responsibilities, which was outlined in section 2.3.3, and in particular that relating to NSW (Kelly 2011) is likely to have been the key driver of these changes in structure and focus.

The questions about the number of council staff dedicated to delivery of environmental policy outcomes revealed a surprisingly strong environmental focus in the rural/regional council, with slightly more dedicated environmental staff than the urban council and over twice the number of environmental staff as the peri-urban council. This disparity is probably explained by the fact that both the rural/regional council and urban council in the case study impose an environment levy which raises a similar income, around \$1 million per year, in contrast to the peri-urban council that does not impose an environment levy.

This would seem to demonstrate that the 'limited community engagement in natural resource management' in rural local government areas that was described by Pini and Haslam McKenzie (2006) and the 'pronounced financial problems and viability issues' restricting the natural resource management capacity of rural and remote LGAs referred to by Pini, Wild River and Haslam McKenzie (2007), and discussed in section 2.3.3, has been overcome in those LGA's where an environmental levy is imposed. Furthermore, it seems to vindicate the argument by Bates and Meares (2010) that local government capacity to deliver on environmental responsibilities 'depends heavily on their capacity to fund and resource appropriate personnel'.

Both the rural/regional community nursery and the urban community nursery had been in operation for a similar period, around seven years. The peri-urban community nursery had a somewhat different genesis, and had been operating more than the twice as long as the others. Grant funding had provided half the

setup cost of the urban community nursery and half to three-quarters of the setup costs for the rural/regional community nursery, whereas grant funding had only provided a quarter of the setup costs of the peri-urban nursery.

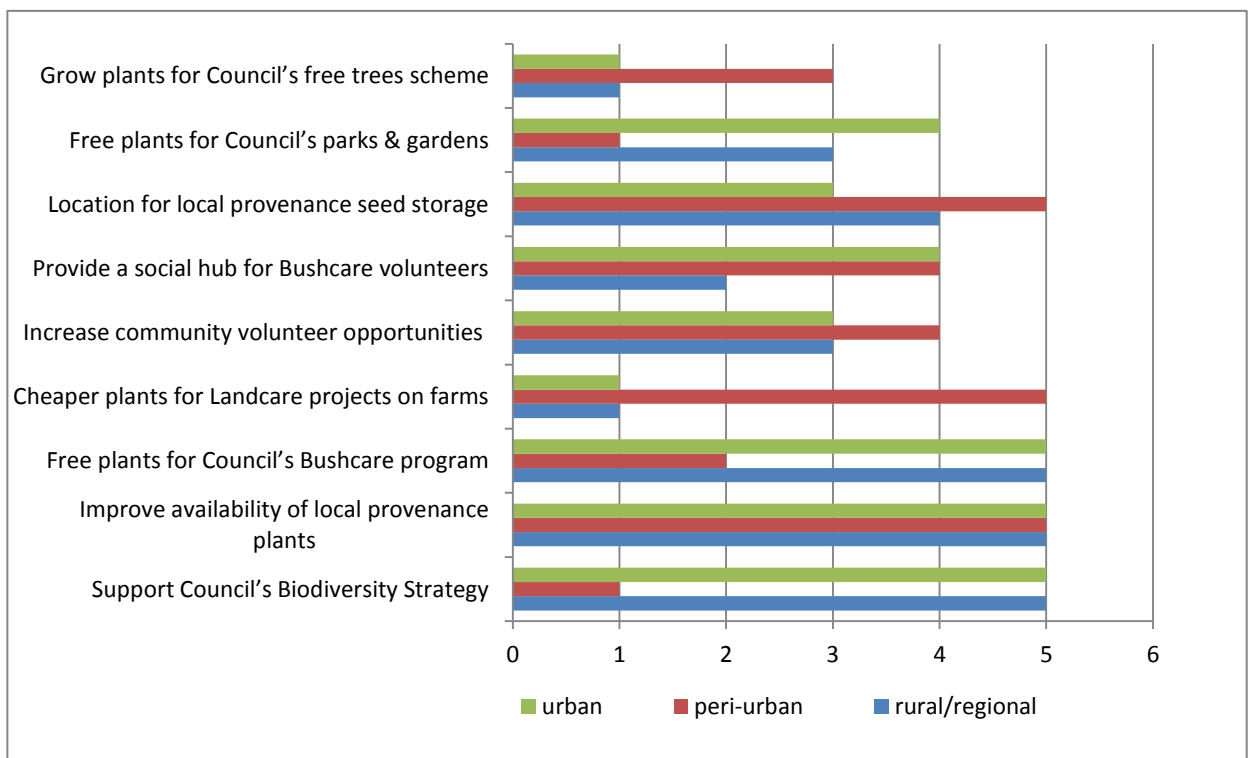
In regard to the annual budget allocation for the community nursery and whether this budget allocation had changed in the last five years, it was reported that the rural/regional community nursery's annual budget was \$15-30,000, and this had increased by less than 25% over the previous five years. The budget allocation for the urban community nursery had almost doubled in the previous three years from \$12,200 to a current \$21,000 per annum. The peri-urban community nursery received an annual budget allocation of \$28,500 which was supplemented by plant sales, bringing its operating budget into the \$45-60,000 range, with the bulk of this being expended on staff wages. Both the urban and rural/regional council branch managers reported that their nursery models did not accommodate the sale of plants, whereas the branch manager for the peri-urban council reported that plant sales were of high importance as funds from plant sales were used to offset nursery operating costs.

The branch managers from the rural/regional council and peri-urban council rated the level of councillor support for their community nursery as 'moderate' while the urban council branch manager rated the level of councillor support as 'very high'. The branch managers rated general community awareness of the community nursery as being 'low' for the rural/regional nursery, 'moderate' for the peri-urban nursery and 'high' for the urban community nursery. However all of them indicated high awareness levels within the environmental/Bushcare sector and a much lower awareness level in the general community. Both the rural/regional and urban council branch managers indicated there was a very high likelihood that council would invest in a significant expansion of the Community Nursery in the next five years, while the branch manager for the peri-urban council indicated there was only a moderate likelihood of such an expansion.

The council branch managers were asked to rate the various factors that influenced their decision to establish a community nursery on a scale of 'very



low' (1) to 'very high' (5). Figure 5 graphs their rating of these factors. All three branch managers reported that a major factor in the decision to establish their community nursery was to 'improve the availability of local provenance plants'. As figure 5 shows providing a 'location for local provenance seed storage' was a significant factor for all three councils but rated strongest for the peri-urban council. Another significant factor for all three councils was to 'increase community volunteer opportunities', but this factor rated more strongly for the peri-urban council. Other major factors for the rural/regional and urban councils were to 'support Council's Biodiversity Strategy', to source 'free plants for Council's Bushcare program' and to source 'free plants for Council's parks & gardens'. In contrast, the major factor for the peri-urban council was to provide 'cheaper plants for Landcare projects on farms', and to 'grow plants for Council's free trees scheme' for ratepayers, which was of low importance for the other two councils. The need to 'provide a social hub for Bushcare volunteers' was an important factor for both the urban and peri-urban councils' decision to establish their community nursery but was only a minor factor in the rural/regional council's decision to do so.



**Figure 5: Significance of factors in Council's decision to establish community nursery**

**Table 4: Council Environment Branch Manager's responses**

<b>Questions</b>	<b>Manager 1 (rural/regional)</b>	<b>Manager 2 (peri- urban)</b>	<b>Manager 3 (urban)</b>
<i>For how many years has Council had an Environment Branch?</i>	Environment Branch for over 16 years focussed on enforcement - current Environment & Sustainability branch has operated for 4-6 years.	Environment Division for 20 years focused on compliance. Current Environment & Human Services Division has operated for 4-5 years.	Environment & Health branch for 16-18 years with enforcement focus and some education. Since restructure about 3 years ago, enforcement function is gone and focus is on environmental enhancement
<i>For how many years has Council had Environment and Sustainability Policies?</i>	Current Environment Strategy has been in place for 7-9 years	A focus on Environmental Plans in last 5 years; prior to that we only had a State of the Environment reporting process.	Current Environment and Sustainability policy in place for 7-9 years designed to reflect the ISO 14001 standard but it is not fully implemented.
<i>How many Council staff are dedicated to delivery of environment policy outcomes?</i>	Seventeen - 10 in the Environment and Sustainability branch (5 in sustainability & 5 in natural resources) plus 5 on the Bushcare Team, one Environment Officer in Operations branch and one Education Officer in the RRC	Seven: 3 specifically involved with environmental policy and 4 implementing environmental works	Thirteen – Fifteen: including Bushcare, Environmental Officer (Operations), water quality including pollution response, sustainability and energy efficiency
<i>Does Council charge an Environment Levy to help it deliver its environment policy objectives?</i>	Yes, from around 2001 but it has changed focus over the years. Initially focus was on bush regeneration and then it included sustainability. It now includes sustainability, natural resource management & biodiversity	No, not strictly an Environment Levy, it is a Catchment Remediation rate that allows council to install and maintain stormwater quality improvement devices	Yes, our Environment Levy is IPART approved; in its current edition it raises around \$1.1M per year
<i>If an Environment Levy is charged, for how many years has this been in place?</i>	13-15	n/a	13-15
<i>For how many years</i>	7-9	For 18 years; it was	7-9

Questions	Manager 1 (rural/regional)	Manager 2 (peri-urban)	Manager 3 (urban)
<i>has Council operated a Community Nursery?</i>		started by volunteers and then Council formalised it with a casual staff member around 2003. It is now a permanent part-time 3 day/week position	
<i>What proportion of the Community Nursery setup costs was funded through grants?</i>	51-75%	Only around 25% including wages; over the last 18 years Council has invested around \$200,000 in the nursery	51-75%
<i>What is Council's current annual budget allocation for the Community Nursery?</i>	\$15-30,000 including staff costs	Budget allocation of \$28,500 supplemented by plant sales which increased it up to the \$45-60,000 range; bulk of this expended on staff wages	\$21,000
<i>Has the budget allocation for the Community Nursery changed in the last 5 years?</i>	Less than 25% increase	no change	The budget has almost doubled in the last 3 years
<i>How important is income from plant sales for funding the Community Nursery operating costs?</i>	Not applicable; nursery model does not accommodate the sale of plants	High importance; the aim is for plant sales to offset nursery operating costs	Not applicable; nursery model does not accommodate the sale of plants to general public
<i>Does Council have an expectation that the Community Nursery will eventually become self-funding through plant sales?</i>	No, land zoning restricts plant sales where the nursery is currently located.	Yes, self-funding was an original mandate for the nursery, with income to offset wages; the nursery is also used as a meeting place and for workshops	Not at this point in time; but if there is a change to current business model this will be reviewed
<i>How would you rate the Councillor's level of support for the Community Nursery?</i>	Moderate; councillors are happy to maintain the nursery support at the current levels	Councillors support is moderate - they don't turn up ton nursery events	Very high; some councillors are very supportive and some are less aware
<i>How would you rate the general community awareness of the Community Nursery?</i>	Within the Bushcare network it would be very high but in the general community it	Moderate; awareness in the general community is patchy. Environmentally-	Awareness within the general community is probably very low but in the environmentally

Questions	Manager 1 (rural/regional)	Manager 2 (peri- urban)	Manager 3 (urban)
	would be quite low	minded people are aware	aware community is quite high
<i>Have local commercial nurseries expressed concern to Council that the Community Nursery burdens them with unfair competition?</i>	no	They did when the nursery was first establish but not of late	n/a
<i>How likely is it that Council will invest in a significant expansion of the Community Nursery in the next 5 years?</i>	Very high; a \$50,000 expansion is being planned	Moderate; may be relocated in future if the depot moves to the site	Very high likelihood of a moderate expansion in the next five years

### 4.3 Community Nursery Coordinator Survey

The nursery coordinators are paid council staff, usually associated with the Bushcare unit, who have responsibility for managing the community nursery and its volunteer workforce; including managing seed stocks, maintaining nursery record systems, stock control, consumables purchase, plant orders/sales, volunteer engagement / training, nursery promotion and reporting. This is often a part-time role, but one that is crucial to the ongoing success of the nursery.

The coordinators of the three community nurseries were given a written survey form to complete and were also interviewed, in order to gather information on the operational environment of their nursery, their focus on biodiversity conservation, the goals and the barriers they face, and the way they engage with volunteers. A summary of their responses is tabulated in table 5 and an analysis of these responses is given in section 4.4.

**Table 5: Summary of nursery coordinator responses**

<b>Questions</b>	<b>Nursery Coordinator 1 (rural/regional)</b>	<b>Nursery Coordinator 2 (peri-urban)</b>	<b>Nursery Coordinator 3 (urban)</b>
<i>Q 1-3: How many years has nursery been in operation, annual production and changes to production capacity in the previous 3-5 years</i>	Has been in operation 6-9 years; current production is 10,000 plants /year; up from 7,000 a few years ago; primarily driven by advanced orders for projects, which take 75% of production	Has been in operation over 15 years; produces 30-40,000 plants /year; little change in production levels in recent years; About 50% of production is driven by advanced orders; strong influence by demand from grant-based revegetation projects.	Has been in operation for 10-15 years; produces over 40,000 plants/year; production increased in recent years following an expansion in the nursery footprint; About 75% of production is grown to order; the nursery is very reliant on these pre orders.
<i>Q 4-5: Percentage of production given away free and percentage discarded</i>	Discard rates very low; 100% of production given away free; old stock targeted to Bushcare site, stock rotated, old tube stock potted up; However the non-collection of plant orders and over-estimation of needs creates stock management issues.	Discard levels are kept very low (1-4%) as any stock that is too old goes into the 'give away' bay; over 50% of production given away free.	Discard rates only 5% and are poor quality stock; about 25% production (~ 7,000 plants) given away free at specific plant give-away days; plus more given to specific community planting events e.g. given to schools for National Tree Day planting events.
<i>Q 7-10: nursery staffing levels for seed collection/propagation operating cost, value of plant sales and hours of operation</i>	No dedicated nursery staff - Bushcare team looked after the nursery on an 'as needs basis'; Seed collection carried out on an ad hoc /opportunistic basis; one half-day volunteer working bee per month. No plant sales due to DA restriction.	Dedicated coordinator employed 3 days/wk plus a dedicated seed collector employed 3 days/wk. The nursery operates three days per week but is only open to the public two days per week. Plant sales very important for funding the nursery's operating costs, including staff wages.	Nursery has full-time coordinator who is also responsible for seed collection; nursery is open 9 ½ day/fortnight (4.75 days/wk). Nursery operates on a fixed annual budget and does not sell plants under current operational model.
<i>Q 11-13: The importance of the volunteer contribution to the nursery; number of regular volunteers and average volunteer hours per month</i>	Volunteers make a major contribution to the nursery; 8 regular volunteers who contribute average 24 hours per month.	Volunteers make a major contribution to the nursery; 11-15 regular volunteers who on average contribute over 200 hours per month.	Volunteers make a major contribution to the nursery; more than 21 regular volunteers (split between a Wednesday group and a Saturday group) who contribute over 250 hours per month.
<i>Q 14-15: How</i>	Little focus on volunteer	Volunteer recruitment is	The nursery volunteer

Questions	Nursery Coordinator 1 (rural/regional)	Nursery Coordinator 2 (peri-urban)	Nursery Coordinator 3 (urban)
<i>much focus on volunteer recruitment and are any volunteers part of a Centrelink-approved Over-55 volunteer program</i>	recruitment as space restricts the number of volunteers that can work in the nursery; no Centrelink-approved Over-55 volunteers currently.	generally ad hoc and spasmodic, rather than structured, and could be done better; nursery does utilise volunteers on the Centrelink Over-55 program and some continue beyond their Centrelink obligations.	program is full with only limited space for new volunteers, so very little effort is put into volunteer recruitment. The nursery does not engage with the Centrelink Over-55 program.
<i>Q 16-20: community nursery focus on biodiversity, the proportion of production that goes to revegetation / landscape restoration, demand for local provenance plants and how that has changed over the last 3 years, percentage of the production that is from local provenance seeds</i>	A very strong focus on biodiversity conservation, growing a diverse range of plants, (trees, shrubs and groundcovers) with 75-100% of the stock going to revegetation / landscape restoration sites. Strong demand for local provenance plants, as most plants are supplied to the Bushcare program where local provenance plants are the focus. All of their production is from local provenance seed.	A very strong focus on biodiversity conservation with 50-75% grown for revegetation. The proportion of production going to revegetation / landscape rehabilitation fluctuates, as is connected to grants which drive revegetation and hence demand. A high demand, with 80-100% of production from local provenance sources. Some increase in the demand for local provenance plants in the last three years. Even people coming to collect free plants under Council's free plants scheme ask for local provenance plants.	A very strong focus on biodiversity conservation as a majority of its stock is grown for restoration work in EECs (endangered ecological communities) where local provenance is often a requirement. Some 95% of production is from local provenance seed and about 5% of production is of non-local native plants. The majority of customers seek local provenance plants.
<i>Q 21-24: availability of local provenance seed; the number of species of local provenance seed held in stock; how this seed is sourced; how difficult it is to obtain and how stock of local provenance seed has changed over the previous 3</i>	Has been little or no change in the amount of local provenance seed held in stock over last 3 years; holding seeds of 100+ species;	Has been little or no change in the amount of local provenance seed held in stock over last 3 years; holding seeds of 292 species; fairly easy to get enough seed for lots of species; very difficult for some species, which directly impacts the range of species propagated; To address this challenge they propagate around 20 species from cuttings.	Has been little or no change in the amount of local provenance seed held in stock in last 3 years; holding seeds of 143 species; a lot of work put into collecting long-viability seeds, including opportunistic collections; and top up with short shelf life species. Has a well-stocked seed storage fridge, some of the seed collected ~15 years ago is still viable. Seed

Questions	Nursery Coordinator 1 (rural/regional)	Nursery Coordinator 2 (peri-urban)	Nursery Coordinator 3 (urban)
<i>years.</i>			availability of some species is significantly reduced in dry years.
<i>Q 25-26: impediments to expanding the production of local provenance plants</i>	A low priority is given to an expansion in production capacity, currently meeting all the KPIs for the nursery contained in Council’s Environment Strategy.	Only moderate priority is given to an expansion in production capacity, limited by size of the nursery facility and by funding for infrastructure expansion.	A very low priority is given to expanding production capacity, demand is fairly static and staffing, space and water issues are the main restrictions on expansion of production.

## 4.4 Analysis of nursery coordinator’s responses

### 4.4.1 Plant production

The rural / regional community nursery had been operating the least time of the three, six to nine years and produced 10,000 plants annually up from 6,000 a few years previously. Production is primarily driven by advanced orders and these make up three-quarters of annual production, with predictions made about likely additional demand driving one-quarter of production. The peri-urban nursery has been in operation the longest of the three, over fifteen years, and produces 30-40,000 plants per annum, a figure that hadn’t changed markedly in recent years. The peri-urban nursery’s production is strongly influenced by anticipated demand from grant-based revegetation projects such as those incorporated into local Green Army projects; and approximately half of its production is driven by these advanced orders. The urban community nursery had been in operation for ten to fifteen years and currently produced over 40,000 plants per annum, with the production increasing in recent years following an expansion in the nursery footprint which permitted the increased production. Three-quarters of its production is grown to order, and the nursery is very reliant on these pre-orders. This high dependence on pre-orders confirms the assertion made by the National Native Seed Industry (ANPC 2016) about the short-term project-based demand cycles, the lack of coordination and the ‘fragmented, erratic and insecure market’ for native seed, referred to in section 2.8.1.

#### **4.4.2 Plant distribution and discard**

The rural /regional nursery reported that their total production is given away to Bushcare and other revegetation activities, and this is the basis on which the nursery was established. As pointed out by the council branch manager, Local Environment Plan zoning restrictions would not allow a commercial nursery to operate from the site where the nursery is located, nor does the rural/regional council operate a 'free trees scheme' for ratepayers. However, the nursery keeps discard rates very low by targeting stock to Bushcare site works, rotating ordered stock, and potting on tube stock into 150mm pots. The non-collection of plant orders and over-estimation of needs is an issue for the nursery, with free supply meaning that there is no price penalty regulating these factors.

The peri-urban nursery reported that over half of their production is given away free. As the council environment branch manager indicated, growing plants for the council's 'free trees scheme' was a significant factor in the decision to fund the nursery. Discard levels are kept very low (1-4%) as any stock that is too old goes into the 'give away' bay.

The urban community nursery reported that a quarter of their production is given away, with some 7,000 plants given away at specific plant give-away days and more given to specific community planting events, for example, given to schools for National Tree Day planting events. They report that discard rates are probably only five percent and the plants discarded are poor quality stock usually related to poor practice by particular volunteers. As reported by the council's environment branch manager, the supply of local provenance plants for the council's Bushcare program and council parks and gardens were major factors in the decision to establish the community nursery.

#### **4.4.3 Nursery operations and staffing**

The rural /regional nursery coordinator reported that they did not have any dedicated nursery staff, and that the Bushcare team looked after the nursery on an 'as needs basis', doing regular checks, making up plant orders and coordinating the monthly working bees, which "doesn't take much time". It currently runs one half-day volunteer working bee per month. Seed collection for



the nursery is carried out by the Bushcare team on an ad hoc /opportunistic basis, assisted by the volunteers as required. The coordinator reported the community nursery is prevented from selling plants. The original Memorandum of Agreement between the Council and the Catchment Management Authority under which it was established, as well as the terms of the Development Application under which it was approved (to operate out of the Council works depot) did not permit the sale of plants.

The peri-urban nursery has a dedicated coordinator employed for three days per week plus a dedicated seed collector employed for three days per week. The nursery operates three days per week but is only open to the public two days per week, directly influenced by staffing levels. Plant sales are reported as being very important for funding the nursery's operating costs, including the wages for the nursery staff. Unlike the other two community nurseries, growing plants to supply Landcare projects on farms in the area was a key rationale behind establishing the peri-urban community nursery.

The urban community nursery employs a full-time coordinator, and the nursery operates on a fixed annual budget. The nursery coordinator is also responsible for seed collection activities. The nursery is open nine and a half days per fortnight, which equates to 4.75 days per week.

#### **4.4.4 Volunteer engagement**

All three nursery coordinators reported that volunteers make a major contribution to the operation of their Community Nursery although there is a significant difference in the numbers of volunteers engaged. The rural/regional community nursery has an average of eight regular volunteers working one Saturday morning a month, contributing on average 24 hours per month. The restricted nursery space limits the number of volunteers that can work in the nursery. The coordinator reports that consideration may be given to running working bees on a weekday, although this could prove impractical. The rural/regional nursery is located in a corner of the council works depot and does not have a dedicated undercover work area. Volunteers have to utilise the staff lunchroom in wet weather and staff ablutions, effectively limiting nursery

activities to the weekends. This nursery doesn't have any Centrelink-approved over-55 unemployed people as community service volunteers.

The peri-urban community nursery has eleven to fifteen regular volunteers and on some days there are more than sixteen volunteers working in the nursery, with over 200 volunteer hours contributed in the average month. The coordinator reports that information on volunteering at the nursery is made available at any event attended and with every opportunity, but recruitment is generally ad hoc and spasmodic, rather than structured. That is, it could be done better. The peri-urban community nursery has excellent facilities, including a dedicated nursery / Bushcare centre, a purpose-built walk-in seed storage cold room, and an extensive outdoor covered work area. The peri-urban nursery does utilise volunteers on the Centrelink Over-55 program and the coordinator reports that they have volunteers who have stayed engaged with the nursery beyond their period of obligation to Centrelink.

The urban community nursery has more than twenty-one regular volunteers split between a Wednesday group and a Saturday group, with over 250 volunteer hours contributed each month (3,005 hours in 2013-14). The coordinator reports that the nursery volunteer program is full and under current circumstances has limited space for new volunteers, so very little effort is put into volunteer recruitment. The nursery does not engage with the Centrelink Over-55 program.

#### **4.4.5 Focus on biodiversity conservation**

All three community nursery coordinators reported a very strong focus on biodiversity conservation. The rural/regional nursery seeks to grow a diverse range of plants, including all the strata (trees, shrubs and groundcovers) with 75-100% of the stock going to revegetation / landscape restoration sites. Some stock is supplied to the annual citizenship ceremony and some stock is provided to programs supported by the Local Land Services. The coordinator reports a strong demand for local provenance plants but acknowledges that they create much of this demand since most plants are supplied to the Bushcare program where local provenance plants are the focus. Anecdotally, people who are supplied plants for Local Land Services (LLS) funded revegetation projects do like

to use local provenance plants and this is promoted by LLS. All of their production is from local provenance seed.

The urban nursery coordinator reported that the majority of its stock is grown for restoration work in EECs (endangered ecological communities) where local provenance is often a requirement. Ninety-five percent of their production is from local provenance seed, with the remaining five percent of production being non-local native plants. The majority of their customers seek local provenance plants with the exception being the Council's Parks Department, which is apparently unconcerned with provenance issues.

The peri-urban nursery coordinator reported that 50-75% of their stock is grown for revegetation. Their coordinator reports that the proportion of their production that goes to revegetation / landscape rehabilitation fluctuates, as it is connected to the funding / grants which drive revegetation and hence demand. The demand for local provenance stock is high and between 80-100% of their production is from local provenance sources. Apparently even the people coming to the nursery for their free plants under the Council free plants scheme ask for local provenance plants. They report some increase in the demand for local provenance plants in the last three years.

#### **4.4.6 Focus on local provenance**

All the nursery coordinators reported little or no change over the previous three years in the amount of local provenance seed they hold in stock; with the rural/regional nursery holding seeds of 100+ species, the peri-urban nursery holding seeds of 292 species and the urban nursery holding seeds of 143 species. The peri-urban nursery reported that they find it fairly easy to get enough seed for lots of species but very difficult for some species, and this directly impacts the range of species propagated. To address this challenge they propagate around 20 species from cuttings. The urban nursery reported that they put lot of work into collecting long-viability seeds, including through opportunistic collections; and top up with short shelf life species (such as grasses). They report having a well-stocked seed storage fridge, with some of the seed collected about 15 years ago by contract seed collectors, most of which is still viable. The difficulties they

encounter with seed supply are more to do with environmental factors, since the seed availability of some species is significantly reduced in dry years. There is also concern about genetic issues, such as inbreeding and viability, since many of the bushland remnants in the Shire are small.

#### **4.4.7 Plans for expansion**

The last two questions asked the nursery coordinators about the impediments to expanding the production of local provenance plants. Question 25 asked how significant in their strategic planning was expansion of nursery production capacity. The urban nursery coordinator gave a very low priority to expanding production capacity, reporting that demand is fairly static and staffing, space and water issues were the main restrictions on expansion of production. It is worth noting that the council environment branch manager indicated that there was a very high likelihood that over the following five years there would be a moderate expansion in the nursery facility.

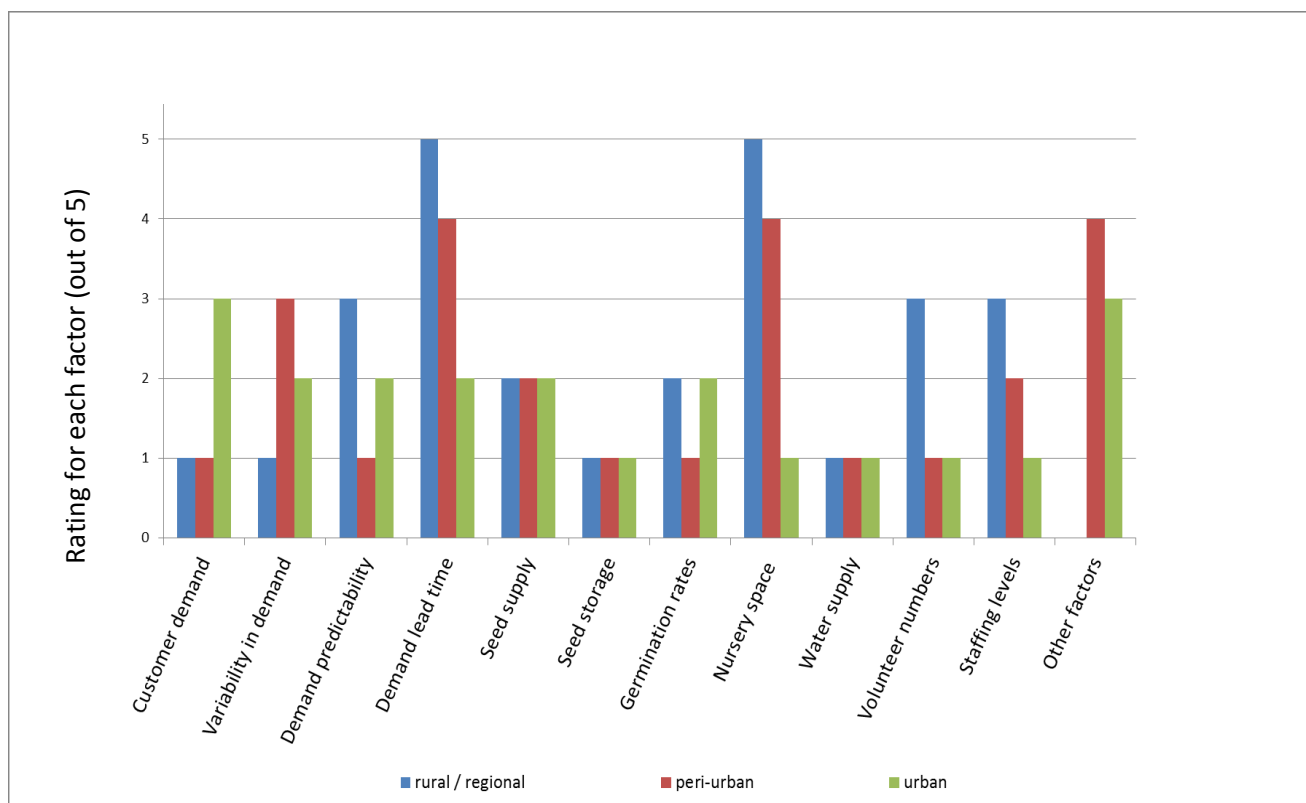
The peri-urban nursery coordinator gave a moderate priority to an expansion in production capacity, reporting that they were limited by size of the nursery facility and by funding for infrastructure expansion. This is in accord with the view of the council's environment branch manager who indicated the community nursery may be relocated in future, which would enable a significant expansion in the community nursery.

The rural/regional nursery coordinator gave a low priority to an expansion in production capacity, reporting that they are currently meeting all the KPIs for the Environment Strategy. However they indicated that the implementation of Riparian Management Plans would be likely to create a higher demand for local provenance plants to which they would respond. Note that the council environment branch manager did consider an expansion in the nursery likely, indicating that \$50,000 had been allocated for planned expansion / nursery refurbishment.

#### **4.4.8 Factors restricting production of local provenance plants**

The nursery coordinators were asked to identify the most significant factors restricting production of local provenance plants. Figure 6 below graphs how the

dozen factors listed were scored by the coordinators. It can be seen that for the rural/regional nursery the most significant limitations on production capacity was nursery space and demand lead time, followed by demand predictability, volunteer numbers and staffing levels. For the peri-urban nursery demand lead time and nursery space were also significant limitations. For the urban nursery the factors restricting production were less clearly defined.



**Figure 6: Factors restricting production of local provenance plants**

In their additional comments to this question the coordinators responded:

*“If we wanted/needed to increase supply then these would be the limiting factors” (rural/regional)*

*“If money were available we could reorganise the nursery to better use available space and install bottom-heated beds to get faster germination, etc.” (peri-urban)*

*“Yes there are significant barriers restricting production - variability in demand is an issue as is demand predictability. Our plant give-away days would generate more demand if they were better advertised. Demand*

*lead times are also a challenge but bottom-heated propagation beds would help overcome this. Germination rates vary season to season and year to year". (urban)*

#### **4.4.9 Summary**

In summary, the council environment branch managers reported that increasing the availability of local provenance plants was a major factor in the decision to establish their community nursery. Providing a location for storage of local provenance seed was also significant for all the case study councils, although more so for the peri-urban council which invested significantly more resources into their seed bank. The provision of free plants for their Bushcare programs and supporting the implementation of their biodiversity strategy were major factors behind the investment by the urban and rural/ regional councils into their community nurseries, but this was less the case for the peri-urban council whose focus on the provision of plants for Landcare projects on farms was stronger.

The environment branch managers all reported a shift in their environment policies, strategies and focus in the previous five years, towards natural resource management, biodiversity conservation and sustainability issues. This change reflected a shift away from a compliance and enforcement focus, to State of the Environment reporting and then to actions directed at improving management of bushland and waterways. One of the key drivers behind this shift was a series of legislative changes to the environmental functions of local government in NSW, which expanded their environmental responsibilities.

Another key driver was a policy shift by the NSW state government which gave local government the capacity to impose environment levies on ratepayers to fund environmental management initiatives. The urban and rural/regional case study councils impose an environment levy that raises around a million dollars a year to fund their environment and sustainability programs. While the peri-urban council doesn't impose an environment levy it does impose a catchment remediation level which funds stormwater quality improvement devices and riparian management. Thus these councils have, to some extent at least,

overcome the resourcing and capacity issues highlighted by earlier researchers as creating significant impediments to effective natural resource management.

The increased funding for environmental management that these levies give to councils led to improved staff capacity to access grant funding from federal and state environmental programs, and to effectively manage NRM projects. There is also a flow-on into Bushcare and Rivercare programs as well as investment into their community nurseries which provide the plants for these programs. The environment branch managers all indicated ongoing council support for their community nurseries, with support from the elected Councillors rated as moderate to high and a strong likelihood that these councils would invest further funds into a moderate expansion of the community nursery facilities.

The nursery coordinators all reported a very strong focus on biodiversity conservation / local provenance, with over 90% of production across the three nurseries being from local provenance sources and with this demand increasing; and with the bulk of their production directed towards environmental restoration / landscape rehabilitation projects. As production levels are sitting at over 80,000 plants a year across the three nurseries, it is clear they are playing an important role in local efforts to conservation and restore biodiversity. They also reported they had a strong reliance on advance orders to drive production; and that they were strongly impacted by fluctuations in demand, with variability in grant-based demand and demand predictability being significant issues.

Demand lead times were reported as a major challenge impacting the community nurseries supply capacity which might be overcome to some extent by an investment in bottom-heated germination beds. All the community nursery coordinators reported a very strong reliance on their nursery volunteers, and all reported they had a cohort of regular volunteers. High volunteer retention rates meant that volunteer recruitment was a low priority and was generally ad hoc or sporadic. Of all the factors limiting increased production of local provenance plants, volunteer numbers were among the least significant.

## 5 VOLUNTEER SURVEY RESPONSES

### 5.1 Introduction

This research project surveyed 54 community nursery volunteers from three distinct Local Government run community nurseries – a small rural/regional nursery (8 respondents), a moderate sized peri-urban nursery (20 respondents) and a moderate sized urban nursery (23 respondents); three respondents did not declare the nursery they volunteered in. The objective of the survey was to ascertain the demographics of community nursery volunteers, the extent of their volunteering effort with the community nursery, whether they also volunteered with other groups and the types of other organisations they volunteer with (questions 1-8). The survey also sought to ascertain their motivations for volunteering, impediments which limited their volunteer effort, whether they felt their volunteer efforts were valued, and how they rated the quality of volunteer engagement in the nursery (questions 9-17). Another set of questions sought to ascertain the volunteer’s views on biodiversity conservation and the role of their local government authority and their nursery in delivering biodiversity outcomes (questions 18-23). Finally question 24 sought information on the areas of skills training of most interest to the nursery volunteers.

### 5.2 Volunteer demographics

The bulk of the community nursery volunteers tended to be over fifty, retired and female. Some 38% of the nursery volunteers were over 70 years of age with two-thirds being over 60 years old (Figure 7).

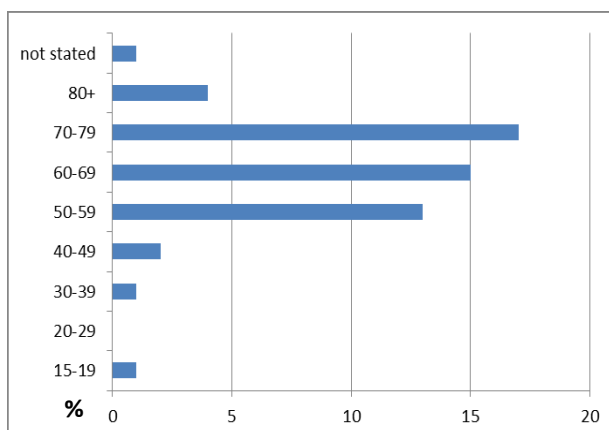
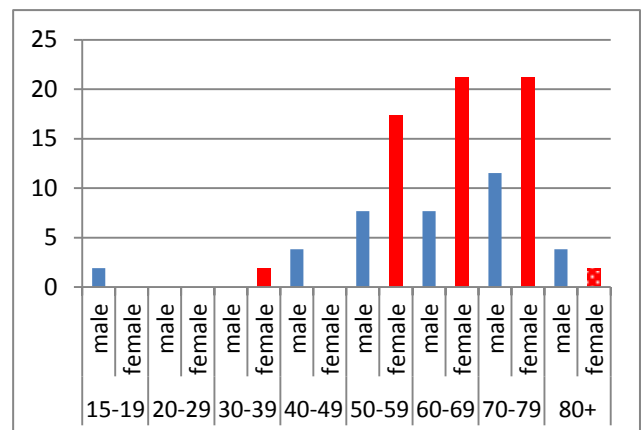


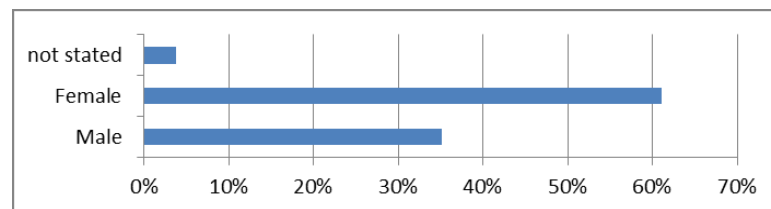
Figure 7: nursery volunteer age groups



7b: volunteer age groups by gender (%)

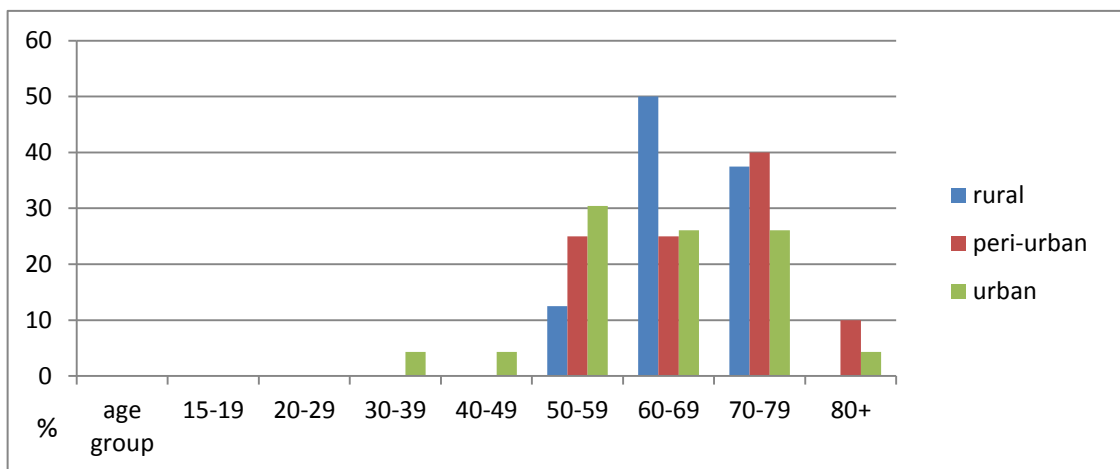


Just under a quarter of the nursery volunteers were in the 50-59 age group and only 8% were under 50 years old. The median age of the volunteers is 64.5 years old. Over 60% of the nursery volunteer respondents were female (figure 8) and females are much higher representation in the 50-79 age groups (figure 7b).



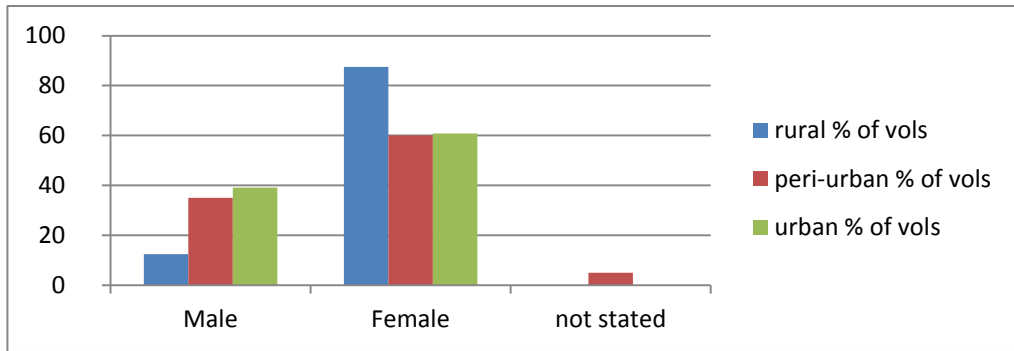
**Figure 8: gender of the nursery volunteers**

Segregating the volunteer age structure into their separate community nurseries shows an older cohort of volunteers in the small rural/regional community nursery, and shows that all the respondents less than 50 years of age volunteered in the urban based community nursery (Figure 9).



**Figure 9: age structure of volunteers - segregated by nursery (%)**

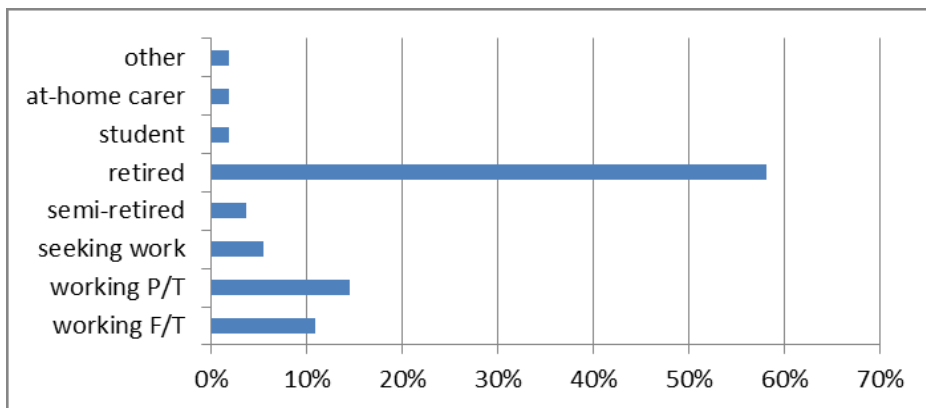
Analysis of the segregated gender data of respondents shows that a higher proportion of males volunteered with the urban based community nursery and a lower proportion of males volunteered at the rural/regional nursery (Figure 10).



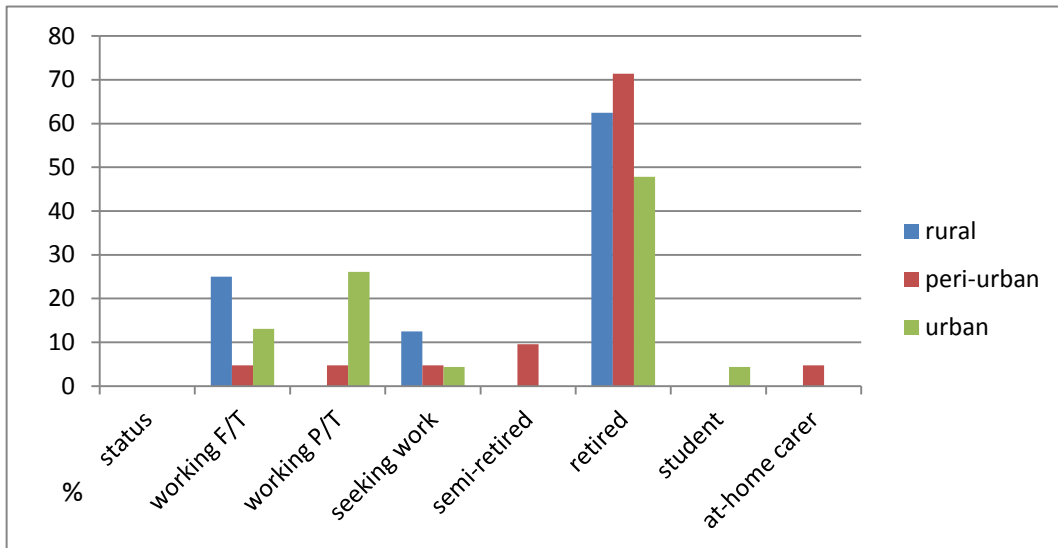
**Figure 10: gender structure of volunteers - segregated by nursery**

### 5.3 Volunteer employment status

Fifty-eight percent of the community nursery volunteers surveyed reported that they were retired, and a further 4% reported being semi-retired. Of the 26% who reported that they were still working more than half were only working part-time. Only two percent reported being students, the same proportion who reported that they were at-home carers. Five percent reported that they were seeking work and two percent did not specify their employment status (Figure 11). The segregated employment status data (Figure 12) did not provide further insight aside from showing a wider spread of employment status, which is possibly a reflection of the larger sample of respondents from the two larger nurseries.



**Figure 11: Employment status of community nursery volunteers**

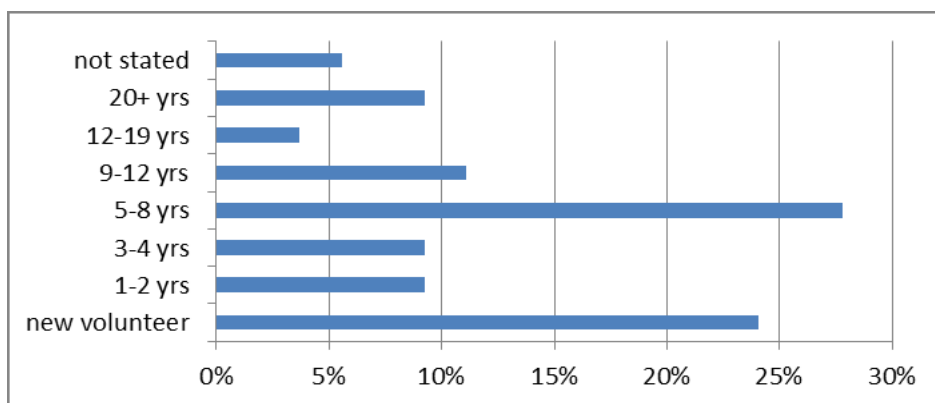


**Figure 12: Volunteer employment status - segregated by nursery**

## 5.4 Extent of volunteer effort

### 5.4.1 Years of volunteering in community nurseries

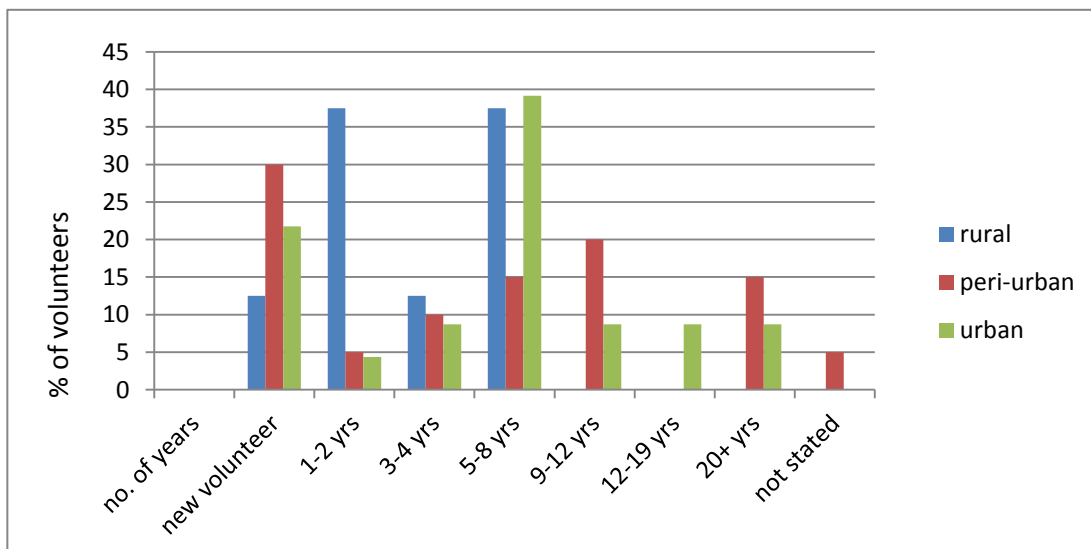
Of the 52 volunteers who reported their length of service as community nursery volunteers 55% had volunteered for more than five years, and a quarter had volunteered for more than nine years. A further quarter of the respondents described themselves as new volunteers while almost 20% reported volunteering for between one and four years (Figure 13).



**Figure 13: years of volunteering in the community nursery**

Figure 14 shows volunteer's years of volunteering segregated by nursery, but is skewed by the differing period of time they had been operating. The

rural/regional nursery had only been operating for seven years while the other two nurseries had been operating for over fifteen years. In addition there was conflicting information on exactly how long the peri-urban nursery and the urban nursery had been operating.

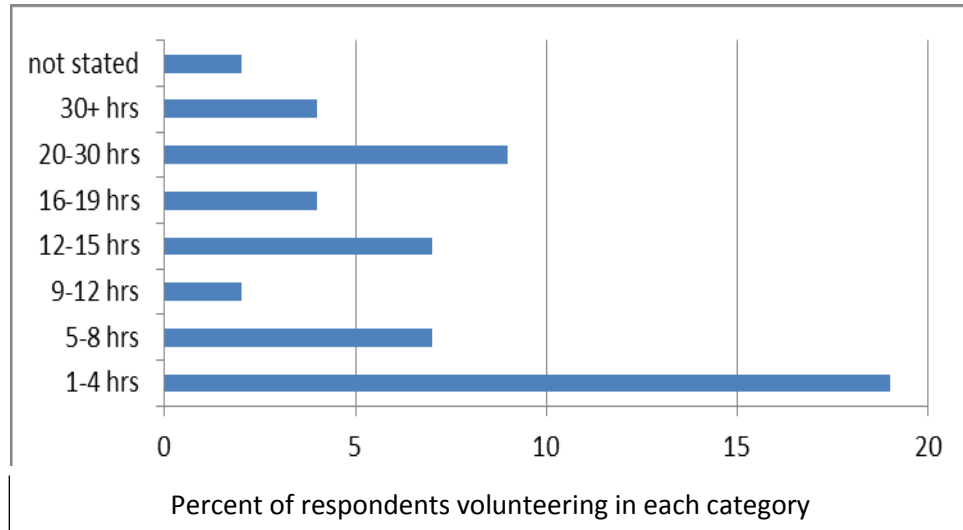


**Figure 14: years of volunteering - segregated by nursery**

Several volunteers in these nurseries reported they had been volunteering for over 20 years but only one of the nursery coordinators reported their nursery as having operated for over 15 years. The Council environment branch managers responsible for the urban and peri-urban nurseries both indicated that their community nurseries had been in operation for only 13-15 years. This discrepancy may be explained in the case of the peri-urban nursery which was initially operated informally by a volunteer group before being formalised some years later by Council. If the analysis of years of community nursery volunteering is restricted to the two nurseries that have been operating for fifteen or more years the data shows that almost 60% have volunteered for more than five years, with 31% having volunteered for over nine years. New volunteers comprised 26% of the respondents while 14% reported they had volunteered for between one and five years.

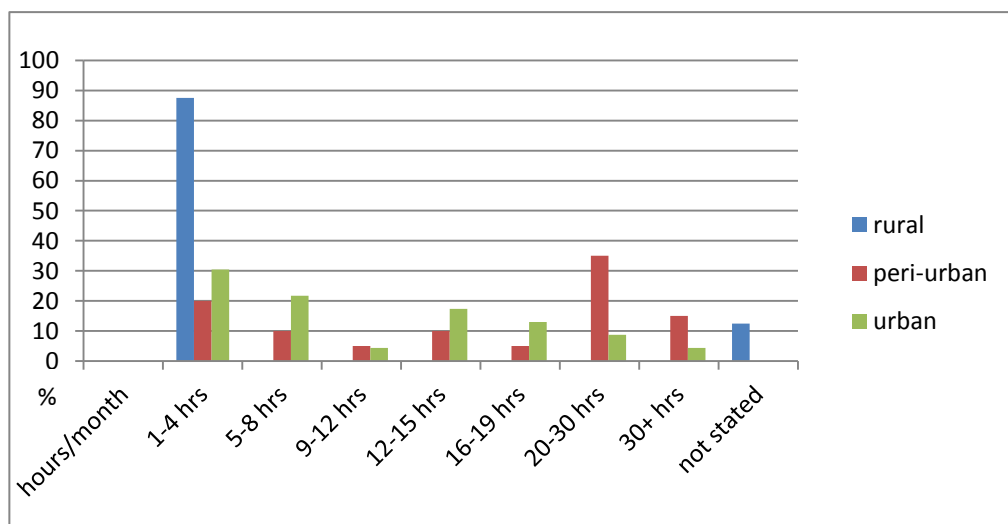
### 5.4.2 Hours volunteered each month

Of the 50 volunteers who reported their average number of volunteer hours in the nursery, 40% volunteer more than 12 hours per month and over 28% of them volunteered more than 20 hours per month. Some 36% reported volunteering for one to four hours per month (Figure 15).



**Figure 15: hours volunteered each month**

However this analysis is skewed by the data from the rural/regional community nursery that only provides one half-day volunteer slot per month (Figure 16) with no other opportunities for volunteering in the nursery. If this data is excluded from the analysis then over 46% of the respondents volunteer more than 12 hours per month and 26% volunteered for more than 20 hours per month, while only 26% of those volunteering in the two larger nurseries only volunteer one to four hours per month.



**Figure 16: hours volunteered per month - segregated by nursery**

### 5.4.3 Volunteering with other NRM groups

When the nursery volunteers were asked whether they volunteer in other NRM programs, such as Bushcare, Landcare, 'Friends of' groups, 44% reported that they did, while 50% did not, and 6% failed to respond to this question (figure 17).

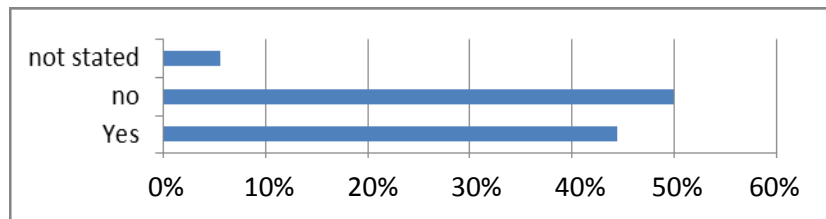


Figure 17: percentage volunteering with other NRM groups

When the data is segregated to the three nurseries the influence of the small regional/rural community nursery, where 75% volunteered with other NRM groups, becomes clear (Figure 18). Since volunteer participation in this nursery is limited to one half-day per month this nursery is skewing the combined data. When the data from the regional/rural community nursery is excluded from the analysis 40% of the 43 respondents reported volunteering with another natural resource management group, and 58% did not, with 2% failing to respond to the question.

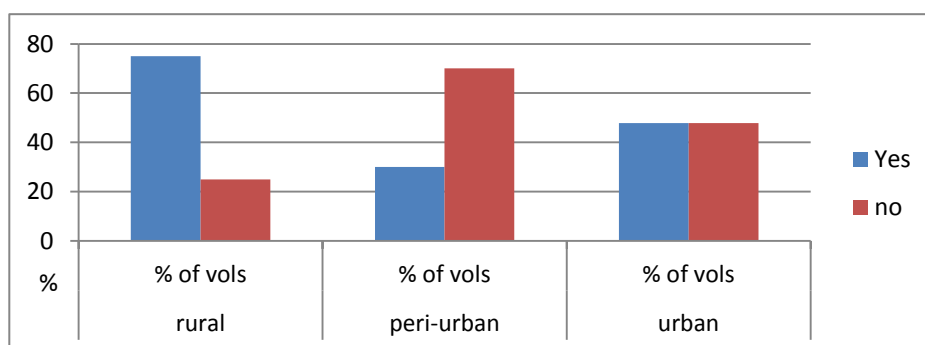


Figure 18: volunteering with other NRM groups - segregated by nursery

Of those who did volunteer with other NRM groups over 75% volunteered with a Landcare group, Bushcare group or with both a Landcare and Bushcare group, with over 58% active in Bushcare groups. Eight percent of the sample also reported volunteering at a second Community Nursery (Table 6).

**Table 6: Response to Q6(b): type of NRM group where respondents volunteer**

Type of group	No. of volunteers	% of volunteers
Bushcare group	10	42
Landcare group	4	17
Both Bushcare & Landcare groups	4	17
NPWS & other NRM group	2	8
Botanic Gardens	1	4
Land for Wildlife	1	4
Another community nursery	2	8
<b>Total respondents</b>	<b>24</b>	<b>100</b>

Thirty-nine percent of the Community Nursery volunteers also volunteer with groups they define as non-NRM groups, with almost a third (30%) of that group volunteering with two or more other non-NRM groups. Table 7 lists the sixteen types of non-NRM community groups that Community Nursery volunteers reported they also volunteer with and the number of survey respondents that volunteer with them. Ten members of this group of volunteers reported volunteering with more than one other community group while six volunteer with only one non-NRM community group. For example, all three volunteers who reported volunteering with general 'friends of' groups (e.g. Friends of the Animal Shelter) volunteer with two or more non-NRM groups.

Only two of the 54 survey respondents reported that they were volunteering as part of their Centrelink obligations (NB Unemployed people in the over-55 age group are able to volunteer with an approved community group as a means of meeting obligations to Centrelink). One of these did not volunteer anywhere else while one reported they also volunteered with a gardening club. Neither of them reported volunteering with another NRM-group.

**Table 7: Response to Q7: type of non-NRM groups respondents volunteer with**

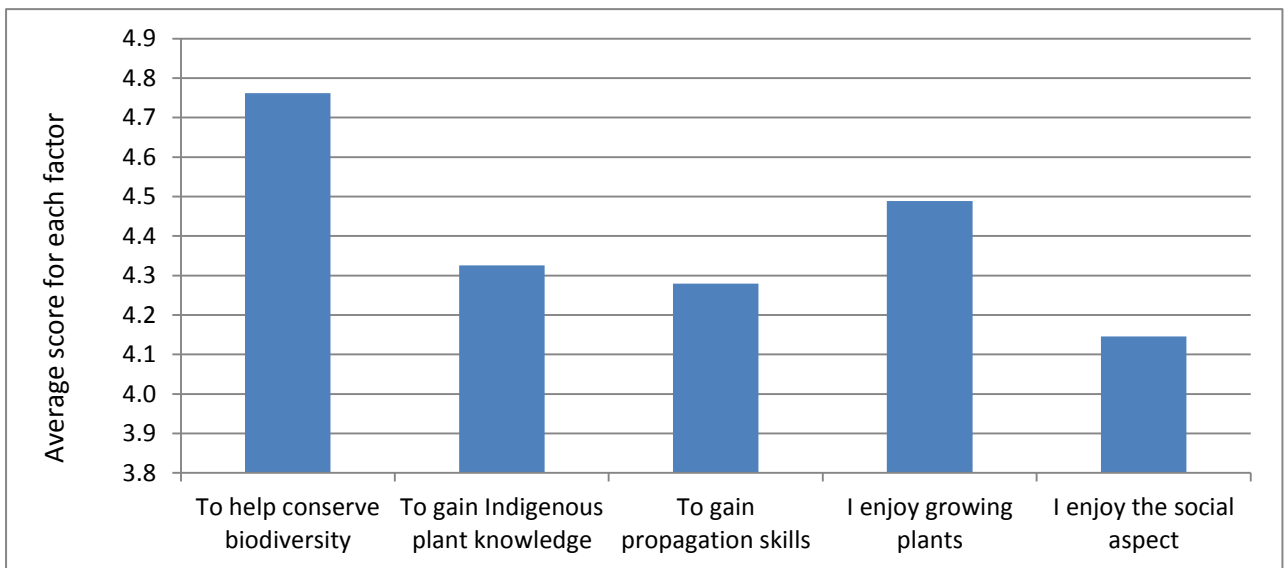
Type of group	No. of volunteers involved with each type of group	volunteering with 2 or more non-NRM groups
Theatre group	1	no
Meals on Wheels	2	no
Church ministry	2	yes
Men's Shed	1	yes
School committees	2	no
English Second Language tutor	1	yes
Gardening Clubs	2	no
Community Gardens	2	yes
Australian Plant Society	2	yes
Environment / climate	1	yes
Rural Fire Service	1	no
General 'friends of' groups	3	yes
Building houses for disadvantaged women	1	no
Breast Cancer support	1	yes
Country Women's Association	1	yes
Sporting clubs	1	yes

#### 5.4.4 Motivations for volunteering

Questions 9 – 13 were designed to ascertain the motivations behind the respondents volunteering in their Community Nurseries. The volunteers were asked to rank the various factors relating to each question on a Likert scale of 1 to 5, and at each question they were provided with the opportunity to make additional comments. In Question 9 the nursery volunteers were asked 'What attracts you to volunteering in the Community Nursery? They were asked to rank each factor on a scale of 1 (low) being a minor influence and 5 (high) being a major influence on attracting them to volunteer in their community nursery. Figure 19 graphs their responses, showing that helping to conserve biodiversity is the strongest motivation for their volunteering in the nursery (4.8), followed by enjoyment of growing plants (4.5), followed by the desire to gain knowledge



about native plants and to gain propagation skills (4.3). Rating the lowest, but nonetheless a very strong 4.1 was 'I enjoy the social aspect'.



**Figure 19: Factors that attract the volunteers to the Community Nursery**

Nine of the respondents indicated there were 'other reasons' for their volunteering in the community nursery and rated these reasons as being significant (4) or very significant (5) to them. Seven of those nine also rated conserving biodiversity as very significant (4.8) and gaining knowledge on native plants as significant (4.3) factors, while gaining propagation skills rated lower (3.9), as did their enjoyment of growing plants (3.7) and the social aspect (3.6). Of the nine who reported 'other reasons' for volunteering in the community nursery, three did not elaborate on those reasons, while one of them listed 'meeting Centrelink obligations' as their primary motivation. One member of this group indicated their primary motivation as completion of their Duke of Edinburgh Award requirements, while another reported they enjoyed using the botany skills they had gained at university but never used in their work as a science teacher at high school. One person indicated they were motivated by a desire to obtain local provenance native plants for their home garden. Another of the nine reported that it helped them stay active; to contribute and be connected to the environment and the local community. Another reported their primary motivation as 'doing something valuable for the local community'.

Of those respondents who indicated that ‘helping conserve biodiversity’ was a very strong factor in motivating their volunteering in the nursery, twelve provided additional comments on their motivations. Four of them listed concern for the environment; acting locally was listed as a way to contribute to global action for a better environment, including as a response to climate change.

*‘It is important to preserve the plants and animals in the local area because if we don't our planet will not survive the increasingly disastrous effects of global warming’ (female, 70-79)*

Others listed contributing to the local community and ‘building community spirit’ as important factors:

*‘It is helping the environment in the think global act local manner. It builds community and develops mentors and mentorees, bolsters spirits often discouraged by never-ending defeats in environmental protection efforts’.*  
(male, 40-49)

Others listed staying active in mind and body and learning new things as important factors:

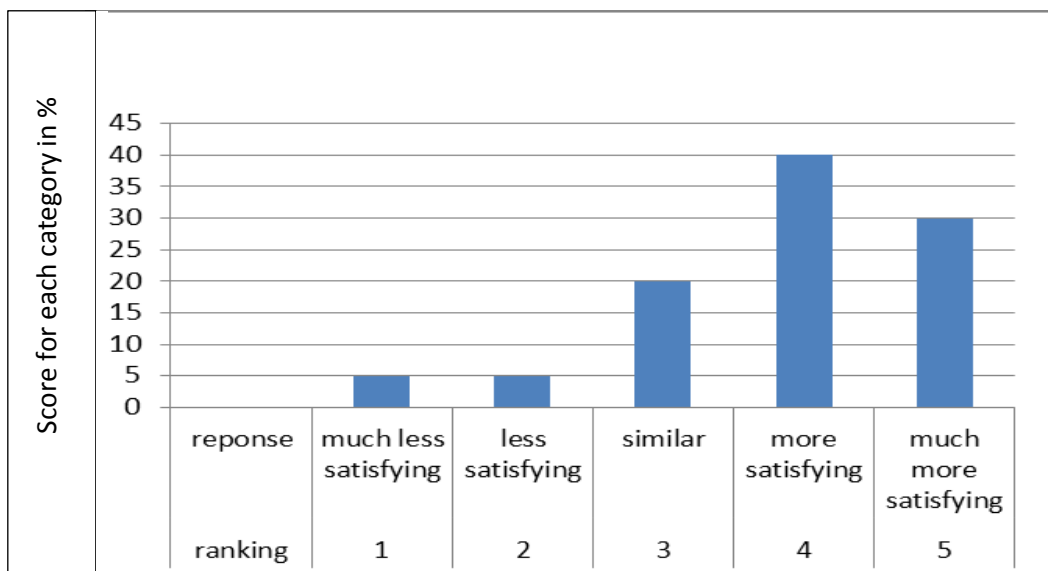
*‘As we age we need to keep using our brain and our body. The interaction between other volunteers is great and learning about plants is great.’*  
(female, 70-79)

One respondent reported that it was ‘great fun’.

#### **5.4.5 The community nursery volunteer experience**

Question 10 asked the nursery volunteers how their volunteer experience in the Community Nursery compared to other areas where they volunteer, if any, and asked them to rate the experience on a scale of 1-5, from much less satisfying (1) to much more satisfying (5). Forty volunteers responded to this question, with their responses ranging over the full spectrum from 1-5.

Overall the 40 volunteers who responded to this question rated their volunteer experience in the Community Nursery as ‘more satisfying’ (3.9/5) than other areas where they volunteer (Figure 20) with 30% rating it ‘much more satisfying’, 40% as ‘more satisfying’ and 20% as ‘similar’.



**Figure 20: How respondents rate their volunteer experience in the community nursery compared to other areas they volunteer**

Two respondents rated it as ‘less satisfying’ while another two rated their volunteer experience in the community nursery as ‘much less satisfying’ than their other volunteering experiences. The reasons they provided for this low ranking were:

*‘Not enough communication with Council staff.’ (female, 80+)*

*‘There is a lack of support from Council.’ (male, 60-69)*

*‘The volunteers are not involved with any decision making or planning and are just told what to do.’ (female, 60-69)*

*‘I want to support the community nursery but my experiences have proved to be frustrating. This is not necessarily the fault of the environmental personnel in the council but due to the nature of volunteering.’ (female, 70-79)*

Eight respondents rated the experience as being on a par with their other volunteer experiences:

*‘I cannot compare my other volunteering as the contexts are quite different - it would be comparing oranges with apples.’ (female, 70-79)*

*‘So far I have not had a bad volunteering experience.’ (female, 70-79)*

*‘It is just as satisfying; there is more social opportunity with the morning tea break.’ (male, 40-49)*

Sixteen found it 'more satisfying' and twelve rated their volunteer experience in the community nursery as 'much more satisfying' than their other volunteer experiences:

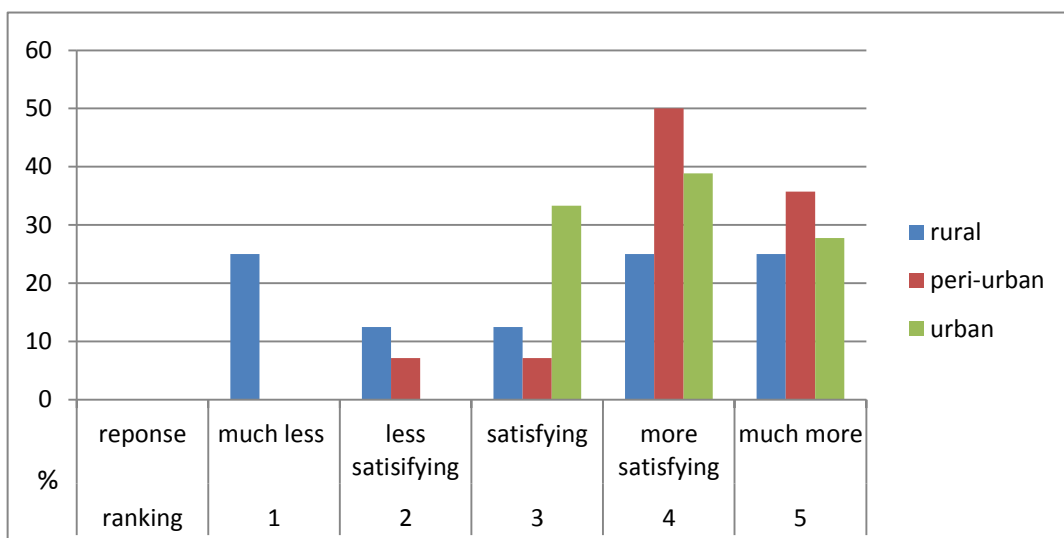
*'I used to volunteer for another council which was also satisfying but this is more so.'* (female, 60-69)

*'I find this volunteer work more satisfying than serving little kids at church, as I enjoy this type of work more.'* (male, 15-19)

*'The social side is excellent and knowledge transfer is very good.'* (male, 50-59)

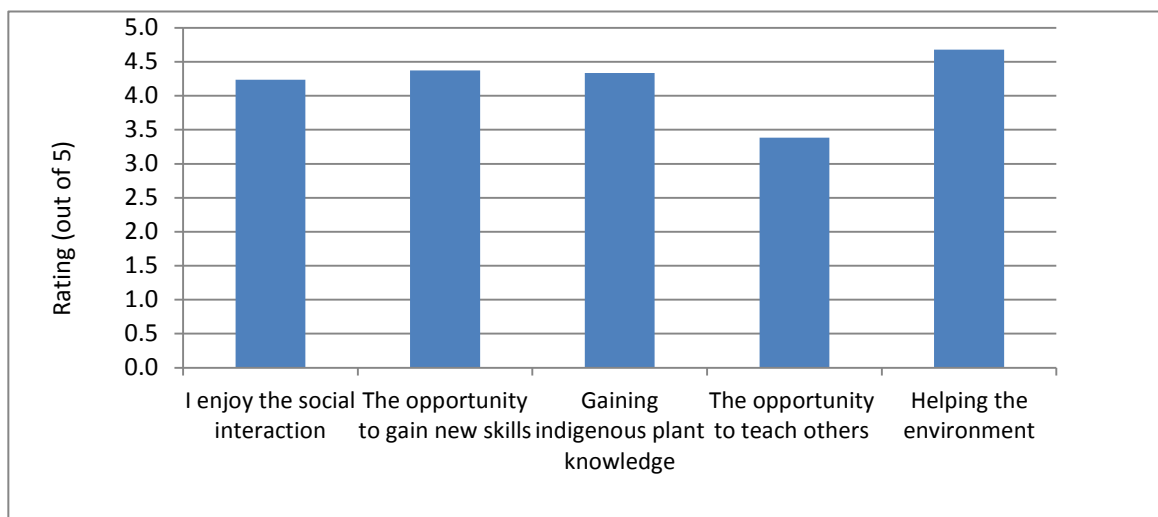
*'Complete 'hands on' experience with seed collection of plant material, planting propagation and promotion of conservation. Great social network and I also look after my roadside vegetation.'* (female, 70-79)

When this data was segregated to the different nurseries (figure 21) the data shows lowest satisfaction levels (3.1/5 or 'less satisfying') at the small regional/rural nursery and highest at the peri-urban nursery (4.1/5 or 'more satisfying'), with the urban community nursery being rated a little lower than the peri-urban nursery (3.9/5). Question 11 asked the volunteers how important volunteering is to fostering community spirit and to rate this on a scale of 1 (not important at all) to 5 (extremely important). The fifty volunteers who responded to this question gave an overall rating of 4.6, indicating that they see volunteering as being very important to fostering community spirit. Volunteers from the peri-urban nursery, where satisfaction levels were highest, also rated the importance of volunteering to the fostering of community spirit highest (4.8).



**Figure 21: how volunteers rate their experience in the Community Nursery compared to other places they volunteer (by %)**

Question 12 asked the volunteers what they personally gain from volunteering and asked them to rate five factors from 1 at the lowest (a minor factor) to 5 at the highest (a major factor). Not all respondents scored all the factors listed, with 51 respondents scoring the factor 'I enjoy the social interaction' but only 44 scoring the factor 'opportunity to teach others'. Forty-five scored the factor 'gaining indigenous plant knowledge', 47 respondents scored the factor 'helping the environment' and 48 scored the factor 'opportunity to gain new skills'. As shown in figure 22, the respondents gave the highest rating to the satisfaction they gain from 'helping the environment' (4.7) followed by the 'opportunity to gain new skills' (4.4) and 'gaining indigenous plant knowledge' (4.3). The respondents rated 'enjoy the social interaction' fairly highly at 4.2, while 'the opportunity to teach others' rated lowest at 3.4.



**Figure 22: What volunteers personally gain from volunteering in the community nursery**

For nine of the respondents 'other reasons' rated highly at 4.4. Several of these volunteers provided additional comments and the social dimension featured strongly in these comments. One stated that:

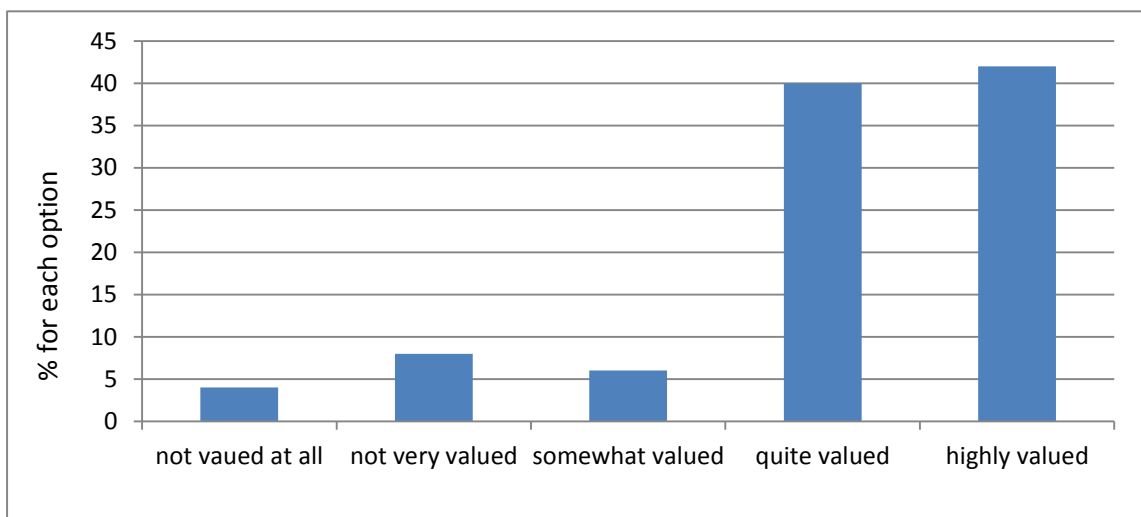
*'I get to mix with different people who aren't part of my regular work / family / friends circle. Quite a diversity and good to learn from those older than me' (male, 40-49)*

Another commented that they enjoyed 'working with like-minded folk and ... local Indigenous folk'; while another commented that volunteering in the nursery

'is the best way to find contacts in the community'. One responded that they were volunteering to support their son who was volunteering as part of his Duke of Edinburgh Award Scheme, and enjoying it. On the other hand one respondent commented:

*'The social group is quite diverse; however sometimes very dogmatic political views can reduce the group's cohesion.'* (female, 70-79)

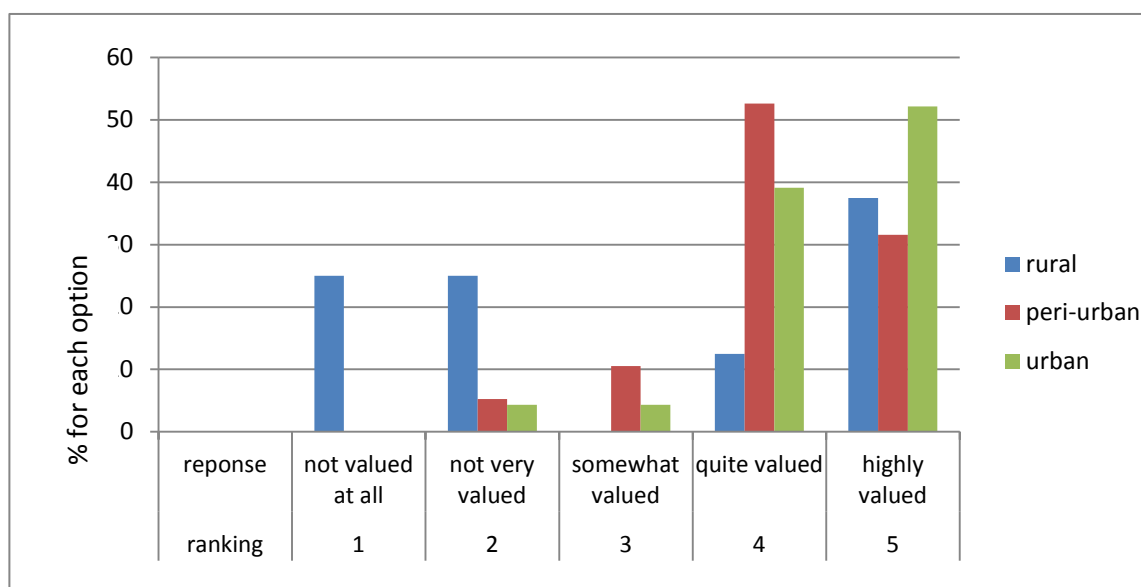
In the context of the nursery staff and Council generally, Question 13 asked the volunteers 'How much do you think your volunteer contribution is valued?' The volunteers were asked to rate their responses from 1 at the lowest (not valued at all) to 5 at the highest (highly valued). Two respondents gave a rating of one and four gave a rating of two, indicating that twelve percent of the respondents perceived that their contributions were not valued appropriately. However, this was strongly outweighed by the 21 respondents who gave a rating of five and the twenty who gave a rating of four. Overall the fifty respondents gave an average rating of 4.1/5 to this question. Expressed in percentage terms, 82% of respondents thought their volunteer contribution was valued: comprised of 40% who indicated it was 'quite valued' and 42% who indicated their contribution was 'highly valued' (figure 23).



**Figure 23: Extent to which the volunteers viewed their contribution is valued (%)**

When the responses to question 13 are segregated to the different nurseries it shows that, of the eight respondents from the small rural/regional nursery, two gave a ranking of one, two gave a ranking of two, one a ranking of four and three a ranking of five, giving an average ranking of 3.1/5 for how much they felt their contribution was valued. This contrasted with the peri-urban nursery where none of the nineteen respondents gave a ranking of one and only one gave a ranking of two for this question, and the average ranking was 4.1/5.

The response to question 13 was most positive at the large urban community nursery where none of the 23 respondents gave a ranking of one and only one gave a ranking of 2/5, with the average ranking for how much they felt their contribution was valued being a very positive 4.4/5 (figure 24).



**Figure 24: How the volunteers view their contribution is valued (% for each option) segregated by nursery**

#### 5.4.6 Barriers / limitations to volunteering in the community nursery

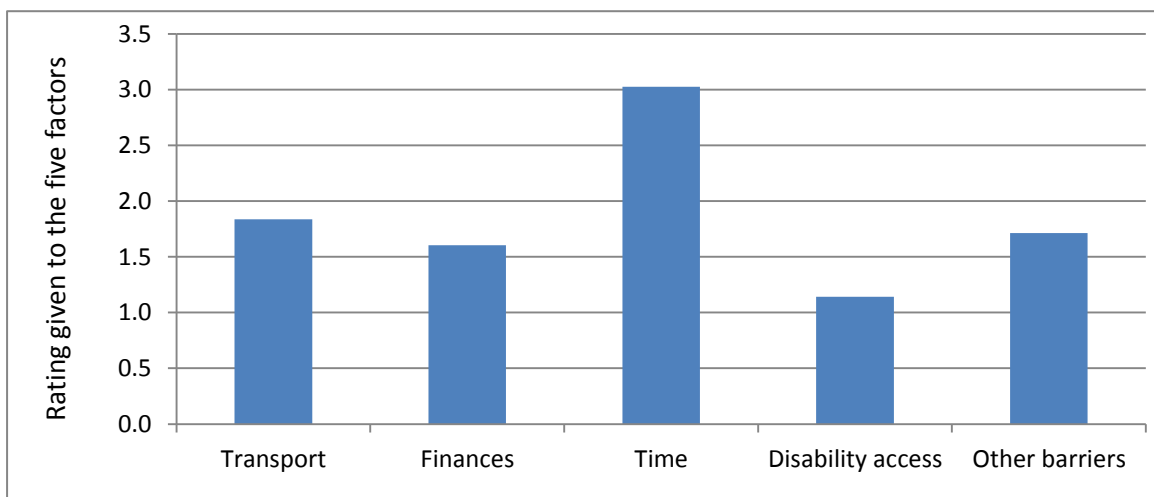
Question 14 asked the volunteers to indicate how significant a range of factors were in limiting their capacity to volunteer in the nursery on a scale where one (1) was not significant and five (5) was very significant. Respondents to this question did not rate all the factors listed. One respondent rated disability access as quite significant (4) and two rated it as somewhat significant (2) while for the other thirty-two it was not significant (1). On average the rating for the disability

access factor was 1.1/5 or not significant. Of the thirty-eight respondents who ranked the impact of finances on their capacity to volunteer, only three indicated that finances were a very significant (5) barrier while two indicated it was a quite significant barrier (4), indicating that finances was only a barrier for 13% of the respondents. Twenty-four respondents (63%) indicated that finances were not a significant barrier (1) and a further two indicated that finances were not very significant. For over two-thirds of respondents finances were not a factor limiting their volunteering in the nursery. The average rating for the financial factor was 1.6/5.

Access to transport was rated by thirty-seven respondents. Four respondents rated it as being a very significant (5) barrier and for one respondent it was a quite significant (4) barrier, indicating that 14% of the respondents found access to transport to be a significant barrier. Twenty-five respondents (68%) reported that access to transport was not a significant barrier for them and a further two reported transport as not very significant. Overall more than two-thirds (73%) of the respondents did not find transport to be a barrier to their volunteering in the community nursery.

Time availability was rated as the most significant barrier overall, rating an average of 3.0/5 by the forty respondents to this question. Fifteen respondents (38%) rated time availability as a very significant barrier (5) while four of the respondents (10%) rated it as quite significant (4). A quarter of this group also listed other factors (transport, finances, disabled access and other) as significant. In contrast fifteen respondents (38%) rated time availability as not significant (1) while three respondents (8%) rated time availability as somewhat significant (2). Overall time availability was rated as a significant barrier by 48% of respondents while 46% did not consider it a significant barrier. A smaller percentage (>20%) of the respondents indicated that there were other factors that acted as a barrier to them volunteering more time in the nursery but for most of this group these 'other factors' weren't rated as significant. Just 5% of respondents indicated these 'other factors' were a significant barrier for them. Figure 25 graphs the significance of the various barriers to the community nursery volunteers.





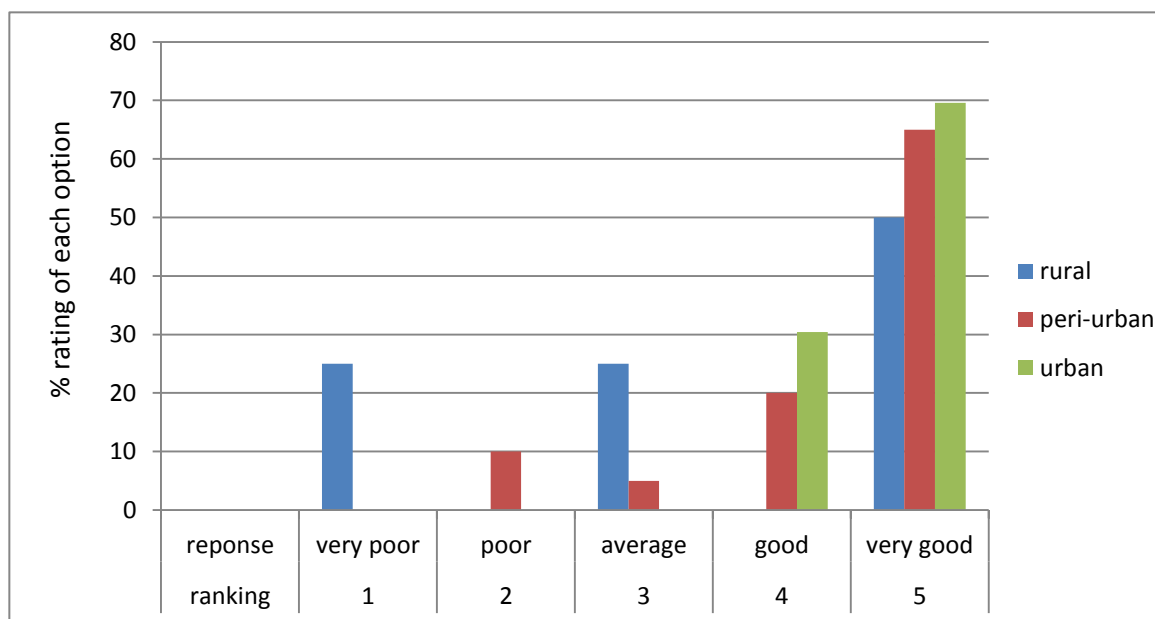
**Figure 25: significance of factors limiting capacity to volunteer in the community nursery**

In their further comments on this question, three of the respondents indicated that their work commitments were a primary factor in limiting the number of hours they could volunteer in the nursery. Two respondents indicated they would volunteer more hours if the nursery was open at other times or had more flexible hours. Other respondents cited family commitments, health factors or other personal issues as being significant barriers to volunteering more hours in the nursery.

Question 15 asked the volunteers to rate the quality of their volunteer experience in the Community Nursery on a scale from 'very poor' (1) to 'very good' (5). Fifty-one respondents answered this question, giving an average rating of 4.4/5, or between 'good' and 'very good', to their volunteer experience in the nursery. Note that this question differs from question 10 which asked the volunteers to compare their volunteer experience in the community nursery to other areas where they volunteered (if any). Question 15 did not seek a comparison but a straight-forward rating of the quality of their volunteer experience in their community nursery. Only two volunteers rated their volunteer experience in the nursery as 'very poor' and only two ranked it as 'poor'. This equates to a very low 7.8% being dissatisfied with their volunteer experience in the nursery. In contrast thirty-three respondents rated their volunteer experience in the community nursery as being 'very good' (5) and

eleven rated it as being 'good'. This equates to 86% being satisfied with their volunteer experience in the nursery.

Segregating the responses from the three nurseries indicates that two respondents from the small rural/regional nursery reported their volunteer experience at the community nursery as being 'very poor', while none of the volunteers from the peri-urban and urban nurseries gave such a low rating to their volunteer experience at their community nursery. Half of the respondents from the small rural/regional nursery reported their volunteer experience as 'very good', while 65% of the respondents from the peri-urban nursery reported their volunteer experience in the nursery as 'very good' and 70% of respondents from the urban community nursery reported their volunteer experience as being 'very good'. The responses to question 15 are graphed in below in figure 26.



**Figure 26: How the volunteers rate the quality of their volunteer experience (%)**

Specific comments from those who gave their volunteer experience a very poor /poor rating were:

*'Organisation and communication is a major issue, not everyone has limitless time to dither... I prefer to know what I am expected to do and when in the time I have available.'* (female, 70-79)

*'The nursery workload ... could be managed better. The facilities have hardly improved over the years.'* (male, 60-69)

Question 16 asked the volunteers to rate how well the Community Nursery engages volunteers on a scale of one (1) being 'very poor' to five (5) being 'very good'. Forty-seven of the respondents answered this question and gave an average overall rating of 4.2. Some 49% of the respondents to this question rated the quality of volunteer engagement as being 'very good' and a further 32% rated the quality of volunteer engagement as 'good', indicating that 80.8% of respondents thought the way their community nursery engaged volunteers was 'good' to 'very good'. Only two respondents rated the way their community nursery engaged volunteers as 'very poor'. The comments provided by the respondents provide insights into why the rating to this question is so positive:

*'We have a wonderful nursery leader who engages with and encourages each and every volunteer.'* (male, 60-69)

*'The nursery coordinator and other staff are very knowledgeable and friendly.'* (male, 50-59)

*'The Nursery Manager has a great way with volunteers and gets the best from them while imparting knowledge.'* (male, 50-59)

*'It is great having a nursery manager and long-term volunteers that are very experienced and knowledgeable about native plants, propagation and biodiversity. They are very dedicated and passionate about improving biodiversity outcomes.'* (female, 30-39)

Yet there were also comments that provide insight into improvements that might be made in volunteer engagement:

*'The way the nursery attracts volunteers is very poor but the way it involves those who attend is very good.'* (female, 60-69)

*'It sometimes needs to 'reconnect' - change is inevitable but it needs to be worthwhile - that is, 'if it aint broke why fix it?' and consult with volunteers before changing things.'* (female, 70-79)

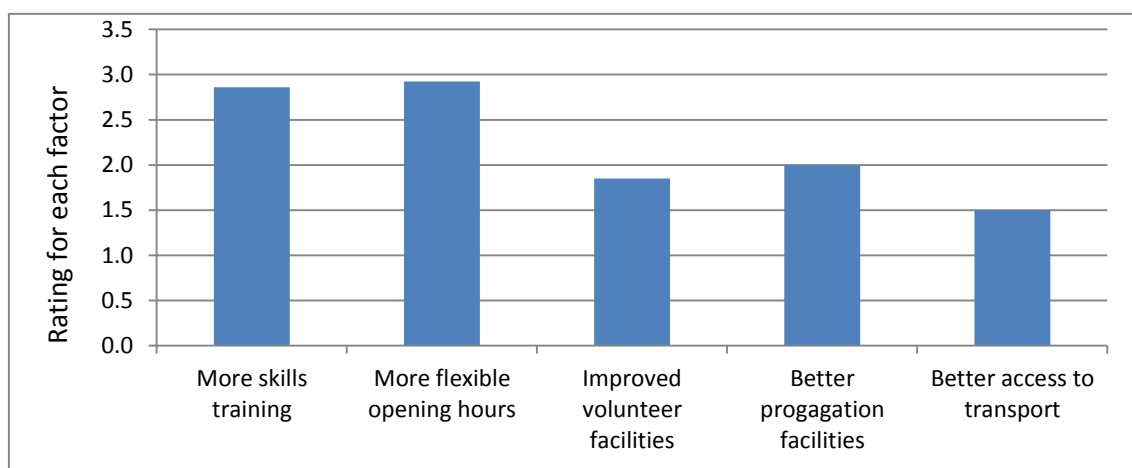
*'Nursery Manager is often rushed and pulled in all directions and sometimes lacks the time to prepare activities, etc, to engage us.'* (male, 40-49)

*'Individual induction and mentoring is needed.'* (female, 70-79)

*'Not everyone volunteers to engage in meaningless chit chat over cups of tea.'* (female, 70-79)

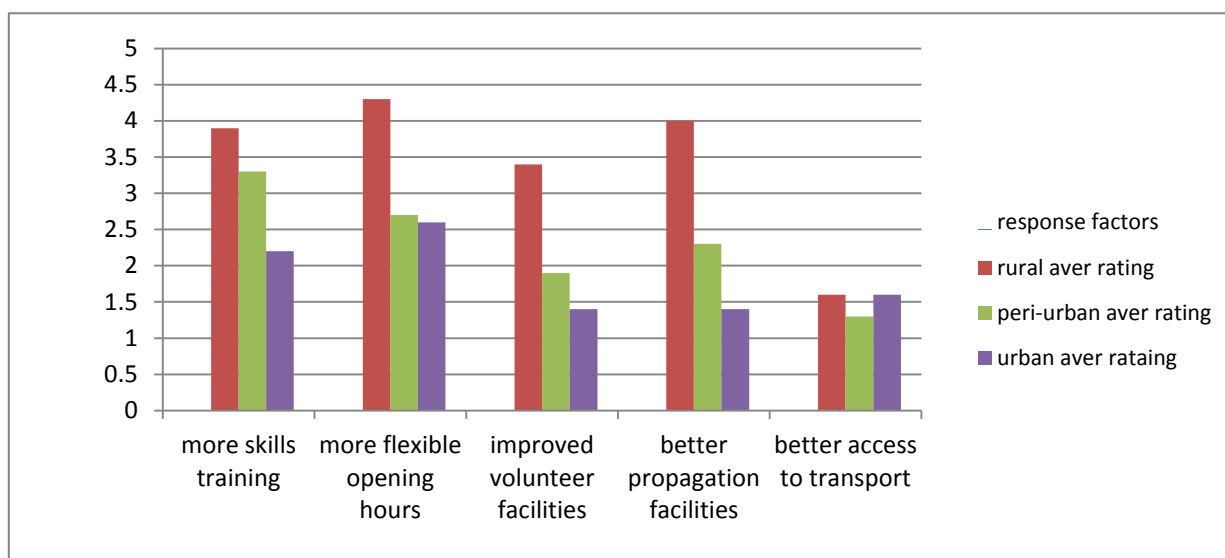
Question 17 asked the volunteers what would encourage them to volunteer more hours in the community nursery, and asked them to rate five factors (and/or 'other factors') on a scale of one to five, where one (1) was 'not significant' and five (5) was 'very significant'. As Figure 27 highlights, the respondents nominated 'more flexible opening hours' and 'more skills training' as the factors which would be most likely to encourage them to volunteer more hours (2.9/5). Eighteen respondents (50%) indicated that more skills training would be a 'significant' or 'very significant' factor in encouraging them to volunteer more hours in the community nursery, while 42% of respondents rated more skills training as either 'not significant' or 'not very significant'. Sixteen respondents (41%) indicated that more flexible opening hours would encourage them to volunteer more hours in the nursery, while the same proportion (41%) of respondents indicated that more flexible opening hours would make little or no difference to their capacity to volunteer more hours.

Of less significance to the respondents was 'better propagation facilities' which received an average rating of 2.0/5, and was rated as 'significant' or 'very significant' by only 19% of respondents; and improved volunteer facilities which they rated at 1.9/5 and was rated as 'significant' or 'very significant' by only 9% of respondents. The least important factor at 1.5/5 was 'better access to transport' which was rated as 'significant' or 'very significant' by only 6% of respondents. Figure 27 shows the average rating of each of the five listed factors.



**Figure 27: Factors that would encourage volunteers to contribute more hours**

Figure 28 graphs the segregated data for the average rating of the five key factors that respondents indicated would influence them to volunteer more hours in the community nursery, showing how the significance of each factor varies between the nurseries. Respondents from the rural/regional nursery identified more flexible opening hours, better propagation facilities and improved volunteer facilities as significant factors much more strongly than those from the urban and peri-urban nurseries. The additional comments drew out the significant disparity between the facilities at the different nurseries, which for the urban and peri-urban nurseries were described as ‘excellent’ and for the rural/regional nursery was described as ‘unpleasant to work at’ and ‘in need of improvement’. Respondents from all three nurseries gave better access to transport a similarly low rating.



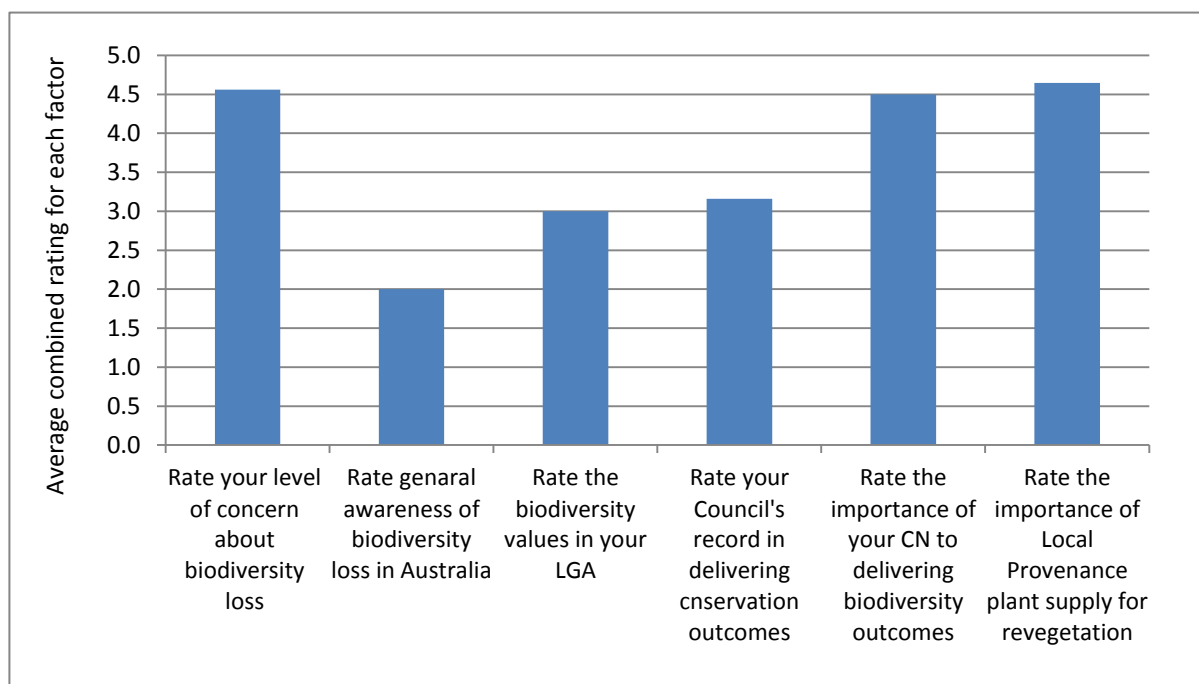
**Figure 28: Factors that would encourage volunteers to contribute more hours (segregated)**

Eight respondents indicated that ‘other factors’ also influenced their capacity to volunteer more time in the community nursery, although only two of those rated the other factors as being significant (4/5) while five respondents rated the other factors as not significant (1/5) and one rated the other factors as somewhat significant (2/5). Comments from the respondents indicated that some are already volunteering as much time as they have available given their other commitments, such as employment commitments. Other respondents stated that they would be happy to volunteer more hours if needed and / or if

the nursery was open on other days of the week or if it had more flexible opening hours. Other comments reflected a significant disparity between the facilities at the different nurseries, which for the urban and peri-urban nurseries were described as ‘excellent’ and for the rural/regional nursery was described as ‘unpleasant to work at’.

#### 5.4.7 Concerns about biodiversity loss

Questions 18 to 23 aimed to elucidate the level of concern felt by community nursery volunteers about biodiversity loss in Australia and in their local government area, and their assessment of the effectiveness of local efforts to reverse biodiversity decline, including the role of the community nursery. Their responses are plotted in figure 29.



**Figure 29: Volunteer perceptions on biodiversity issues – survey questions 18-23**

Question 18 asked the community nursery volunteers to rate their level of concern about the biodiversity loss in Australia on a scale of one (1) being ‘very low’ to five (5) being ‘very high’, and provided them the opportunity to make further comment. Of the fifty respondents to this question, thirty-six (72%) rated their concern as ‘very high’ (5), nine (18%) respondents rated their concern as ‘high’ (4), two reported being moderately concerned (3) and three respondents reported a ‘low’ level of concern about biodiversity loss. None of the

respondents indicated a 'very low' level of concern about biodiversity loss. Overall ninety percent of the respondents rated their concern about biodiversity loss at 'high' to 'very high', with the overall rating for this question being 4.6/5 or 'very high'. The comments provided to this question reinforce the respondents' very strong levels of concern about biodiversity loss:

*'Biodiversity is running down in Australia!'* (male, 60-69)

*'The rate at which our endangered ecological communities are being destroyed at the expense of making money is disgusting.'* (male, 50-59)

*'We have lost many species of plants and animals even before we could identify them and this includes insects.'* (female, 70-79)

*'Due in part to the extreme lack of concern by state and federal governments.'* (male 70-79)

*'passing the 10/50 legislation, allowing trees to be removed at whim! That fails to respect our flora and fauna all for the sake of a profit!'* (female, 70-79)

*'The natural environment is under constant attack; locally the suburb has seen canopy loss increase more than 100% since weaker TPO. Nationally there is a loss of migratory bird habitats. Governments are largely inactive. Economy is king but no jobs on a dead planet.'* (male, 40-49)

Several of the responses to this question draw the explicit link between their concern about biodiversity loss and their motivation to volunteer in the community nursery:

*'So much vegetation is being removed, particularly trees; this is my small contribution to offset this.'* (female, 50-59)

*'My concern about biodiversity loss in urban region is the main reason I began volunteering at community nurseries.'* (female, 30-39)

*'I despair at the situation! But I remain hopeful always; if everyone looked after their patch what a difference it would make!'* (female, 70-79)

*'Tap into 'the power of one'; do local think global; There is a scary future with respect to climate change, economic emphasis, overseas mining leases, farming pressure. Many people are too concerned with their own issues.'* (female, 60-69)

One respondent, aged over eighty, indicated a resigned indifference to the issue of biodiversity loss:

*'It doesn't apply to me - I'm too old now.'* (female, 80+)

Question 19 asked the community nursery volunteers to rate their perception of the general community awareness about the loss of biodiversity in Australia on a scale of one (1) being 'very low' to five (5) being 'very high', and provided them the opportunity to make further comment. Seventeen of the fifty respondents to this question rated the general community awareness of biodiversity loss as 'very low' (1/5), and a further eighteen rated it as 'low' (2/5). That is, 70% of the respondents rated the general community awareness of biodiversity loss as 'low' to 'very low'.

At the other end of the scale, none of the respondents viewed the general community awareness of biodiversity loss as being 'very high' (5/5), and only two respondents viewed it as 'high' (4/5). Thirteen respondents (26%) rated the general community awareness as being 'moderate' (3/5). On average the respondents perceived the general community's awareness of biodiversity loss as being 'low' (2/5). Most of the additional comments provided by respondents to this question highlight the importance of education to raising the level of awareness in the general community about biodiversity loss:

*'Some individuals are aware but more education and involvement always, home, school, work and society.'* (female, 70-79)

*'The lack of community awareness about the loss of biodiversity is a major concern and is an issue that all levels of government need to address through education programs and better laws that protect urban and rural biodiversity'.* (female, 30-39)

*'You only have to look at the new housing estates and the people who are moving in to them. They don't have a clue what has been destroyed.'* (male, 50-59)

*'(People have) some knowledge. The local nursery industry are not particularly active in education; ABC Gardening show has an Australian emphasis but only watched by a minority; people travel overseas but don't travel much in Australia.'* (female, 60-69)



*'I don't know how much education people older than me have received on this topic but I assume education has grown in schools, etc.'* (male, 15-19)

Some of the respondents highlight what they see as an indifference to the natural environment or even a dislike/fear of the natural environment:

*'I volunteer by picking up litter in my local streets and bushland. The load is staggering and reflects a 'couldn't care less' selfish attitude by many in the community. Look at any neighbour's garden and see the dumbing down of indigenous plant awareness.'* (male, 40-49)

*'Some people still believe native plants are nasty things; they don't have much concept that plants and animals evolve to support each other in a delicately balanced ecosystem.'* (female, 70-79)

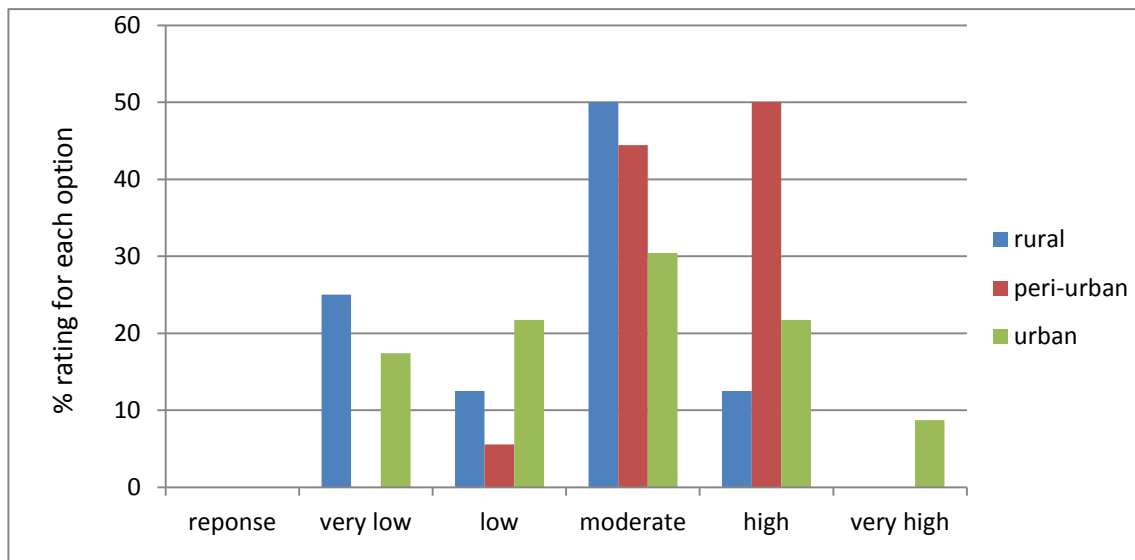
*'Most people don't know one plant from another; for many it's all bush and there's too much of it as it's a source of dangerous snakes and fires.'* (female, 60-69)

Two respondents indicated that a disregard for biodiversity is being promulgated by government or other 'influential' people:

*'I am concerned that some influential people offer opinions that are not based on scientific evidence.'* (female, 70-79)

*'(Awareness levels are) low due to the Abbott government attitude!'* (male, 60-69)

Question 20 asked the community nursery volunteers to rate the biodiversity values within their Local Government area on a scale of one (1) being 'very low' to five (5) being 'very high', and provided them the opportunity to make further comment. Nineteen respondents (39%) rated the biodiversity values in their local government area as 'moderate' (3), while 17 respondents (35 %) gave a rating of 'high' (4) to 'very high' (5) and 13 respondents (26%) gave a rating of 'low' (2) to 'very low' (1). Figure 30 below shows the responses to this question segregated to the different community nurseries.



**Figure 30: How volunteers rate the biodiversity values within their LGA (%)**

In their comments on this question it is clear that many respondents conflated their response to this question with other questions in this section, particularly with the following question about their Local Government’s record in delivering biodiversity outcomes. Some respondents did respond to the actual question with their additional comments:

*‘Awesome local bushland just 20 kms from Sydney CBD with an abundance of birdlife, echidnas, bandicoots, etc.’ (male, 40-49)*

*‘Our shire has significant biodiversity values but I think there is a general lack of awareness and appreciation.’ (female, 60-69)*

*‘Because of 70% catchment areas and natural areas (National Parks) large areas are ok. Roadsides and creek lines need tender loving care.’ (female, 70-79)*

*‘Compared to other government areas it is good.’ (female, 50-59)*

Some respondents focused more on their neighbourhood rather than their shire as a whole:

*‘Pretty low - nature strips are still maintained as traditional lawns.’ (female, 50-59)*

*‘Where I live it is very low.’ (female, 70-79)*

The comments of other respondents seem to relate more to the previous question about community awareness of biodiversity loss:

*'Many local people value the "exotic" landscape and think there is more than enough bushland. Eucalypts particularly are frequently removed.'*  
(female, 60-69)

*'More education is needed.'* (male, 60-69)

As mentioned above, some comments to this question seem to conflate it with the following question about their Local Government's record in delivering biodiversity outcomes:

*'Unbelievably, [...] has dropped 'Bushland Shire' from its letterheads.'*  
(male, 60-69)

*'[...] Council has (in recent years) reduced protection for local vegetation (e.g. through relaxing the tree preservation order) and has also played a role in biodiversity loss by removal of areas of endangered ecological communities and a failure to replace removed trees.'* (female, 30-39)

*'Taking bushland out of the list of [...] Shire' values is of real concern, as is reducing house block and rural landholding size. Increasing subdivision is threatening wildlife, biodiversity, environment, water etc.'* (female, 60-69)

*'It was much better under previous Council management. The new management has scaled back on environmental issues.'* (female, 60-69)

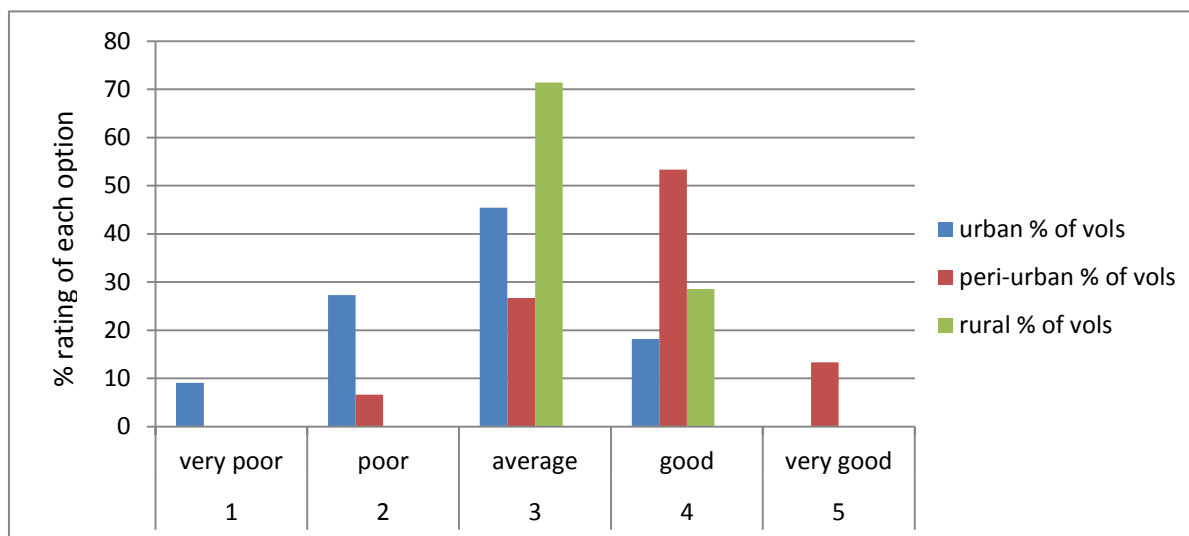
*'The [...] bushcare staff have very good awareness and approach to maintaining high values.'* (male, 70-79)

*'They write lively little articles in the newsletter about mulching and recycling and they do plant some native trees but I don't believe that they really 'get it'.'* (female, 70-79)

*'Not sure, but it supports our nursery! It funds ratepayer plant give-aways but it supports development; 'rural' values are worn like a badge (but see last sentence).'* (female, 60-69)

Question 21 asked the community nursery volunteers to rate their Local Council's record of delivering biodiversity conservation outcomes on a scale of one (1) being 'very low' to five (5) being 'very high', and provided them the opportunity to make further comment. Overall the respondents gave their local government a comparatively low rating of 3.2/5 with 43% of respondents rating their local government's record as moderate (3/5). Overall 91% of the respondents rated their Local Government's record in the middle range from 2/5

and 4/5. Segregating the data from the three community nurseries (figure 31) shows that just one-third of the respondents from the small rural/regional community nursery rated their Council's record on biodiversity conservation in the 'good' (4/5) to 'very good' (5/5) range, compared to two-thirds (67%) of the respondents from the peri-urban community nursery. On the other hand only 18% of respondents from the urban community nursery rated their Council's record on biodiversity conservation in the 'good' (4/5) to 'very good' (5/5) range.



**Figure 31: How volunteers rate their LGA's record on biodiversity conservation (%)**

In their comments on this question several respondents drew a distinction between the attitudes demonstrated by Council in general and those of the environment branch of Council which managed their Community nursery and other biodiversity programs.

*'The Bushcare and Biodiversity sections do a fantastic job but are undermined by the rest of Council.'* (female, 60-69)

*'I have the impression that some dedicated Council officers are working in a negative environment making it either very difficult or impossible to deliver their stated biodiversity conservation outcomes.'* (female, 70-79)

*'Funding for the community nursery and Bushcare programs are the only things [...] Council appears to do to protect biodiversity, but much more could be done (e.g. stronger tree preservation orders, significant tree register, protecting trees on public land).'* (female, 30-39)

*'The environment levy funding and the Bushcare section are extremely good but other sections of Council are reluctant to support the Bushcare work or an expansion of the nursery.'* (female, 60-69)

Some of the comments reflect the respondent's views regarding their Council's changed priorities toward environmental policy following the election of a new Council.

*'It has been better in the past, but the current council, including the mayor, are less interested in biodiversity than in the past.'* (male, 50-59)

*'It was much better under previous Council management. The new management has scaled back on environmental issue.'* (female, 60-69)

*'A weaker TPO (tree protection orders), increased 'bean counter' liability view of mature indigenous eucalyptus trees, Real Estate agent as Mayor and town beautification agenda e.g. non-threatening European fruit trees, poor street planting program and no Council opposition to 10/50 tree clearing regulations.'* (male, 40-49)

*'Our [...] Shire Council Mayor and General Manager have very poor understanding of nature conservation values and only want to plant exotics on street sites (e.g. introduced palms and European trees), also enforcement of the new 10/50 clearing rules.'* (male, 70-79)

Some of the comments to this question acknowledge the broader pressures on Council that limit what they are able to do in regard to biodiversity conservation:

*'Some areas are fantastic but I have concerns about the impacts of increasing subdivision and smaller property sizes.'* (female, 60-69)

*'They try very hard but mining etc., makes huge impacts.'* (female, 70-79)

*'Fairly good, except when they cut down large canopy trees and don't replace them.'* (male, 50-59)

*'Good except for paranoia over tall trees.'* (female, 50-59)

*'There are some excellent programs but unfortunately educating the community is not easy.'* (female, 60-69)

*'They are trying but they need to develop a broader understanding of ecosystems. If we continue to wreck this planet we don't have anywhere else to go. The creatures who share the planet don't have any choices or options either. The Council is quite dysfunctional and this impacts on*

*effective governance. Self-interest is always alive and well.'* (female, 70-79)

Question 22 asked the community nursery volunteers to rate the importance of their Community Nursery to delivering biodiversity conservation outcomes on a scale of one (1) being 'very low' to five (5) being 'very high', and provided them the opportunity to make further comment. Fifty respondents answered this question with an overall rating of 4.5/5 or 'high' to 'very high'. Segregating the responses from the different community nurseries showed the highest rating for the urban nursery, where the 23 respondents gave an average 4.8/5 or 'very high', and the lowest for the small rural/regional nursery, where the eight respondents gave an average 4.3/5 rating, skewed somewhat by the one response of 'very low' (figure 32).

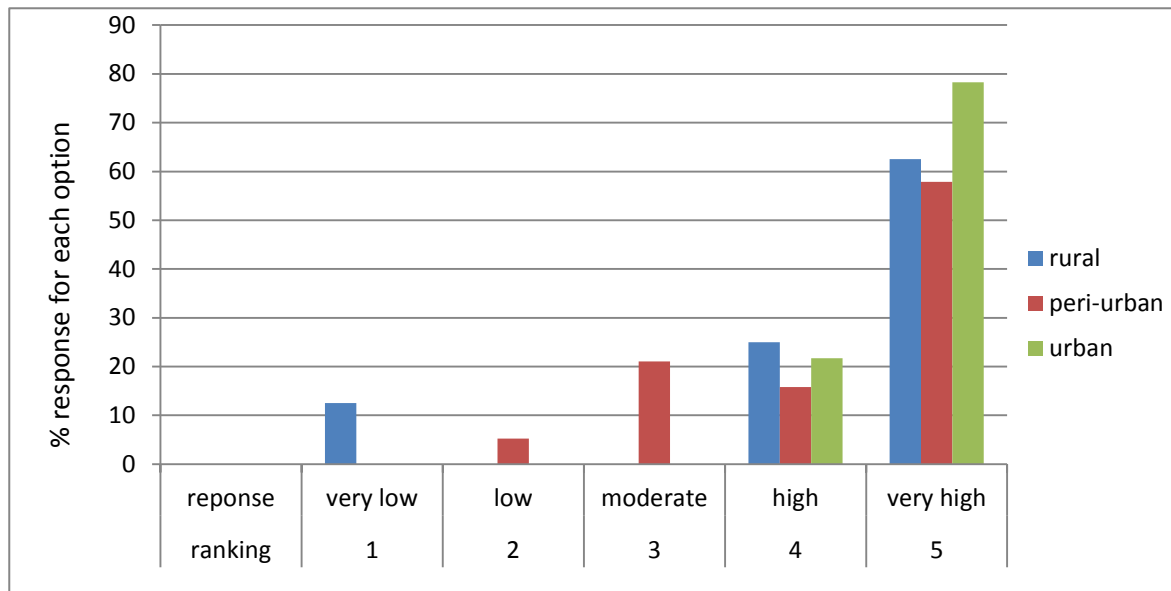


Figure 32: How volunteers rate their Community Nursery for delivering biodiversity (%)

In their comments on this question some respondents focused on the important community education role that their community nursery plays:

*'It is an important entry point for residents to discover [the] importance of indigenous plants within their local garden and bushlands in conserving biodiversity by information stalls from Council's other NRM arms providing important educational tools at these plant giveaway days.'*  
(male, 40-49)

*'Local residents and community awareness are the key, children are keen when young but they need life-long nurturing.'* (female, 70-79)

Other respondents focussed their comments on the value of the outputs from their community nursery for biodiversity conservation:

*'45 species are propagated from indigenous seed and cuttings; 43,000 tube stock produced each year.'* (female, 50-59)

*'Without the Community Nursery very little would be done in [...] LGA to deliver conservation outcomes. The community nursery plant give-aways encourage local residents to plant indigenous species on their properties.'* (female, 30-39)

*'I know that we give most of our plants to parks, national parks, nature strips, etc and it seems that the nursery is important to [...] Shire's biodiversity.'* (male, 15-19)

*'It is the focal point for Bushcare and Landcare groups and rate payer give-aways.'* (male, 50-59)

Some respondents thought that their community nursery should be promoted better to make more people aware of the role they play in supporting biodiversity conservation:

*'Not many people know about or come to Nursery for their domestic garden plants; orders filled for business concerns (development), schools, etc.; Some attempt via 'open-days' to broaden influence; volunteers have some influence but are preaching to the converted.'* (female, 60-69)

*'Better education, more people should know of (community) nurseries!'* (male, 60-69)

Other respondents lamented the lack of support for the community nursery and argued their community nursery would be able to make a greater contribution to biodiversity conservation if it had more support from Council:

*'The Community Nursery could deliver more if the organisation was better. A sincere commitment on the part of the Council would be an advantage.'* (female, 70-79)

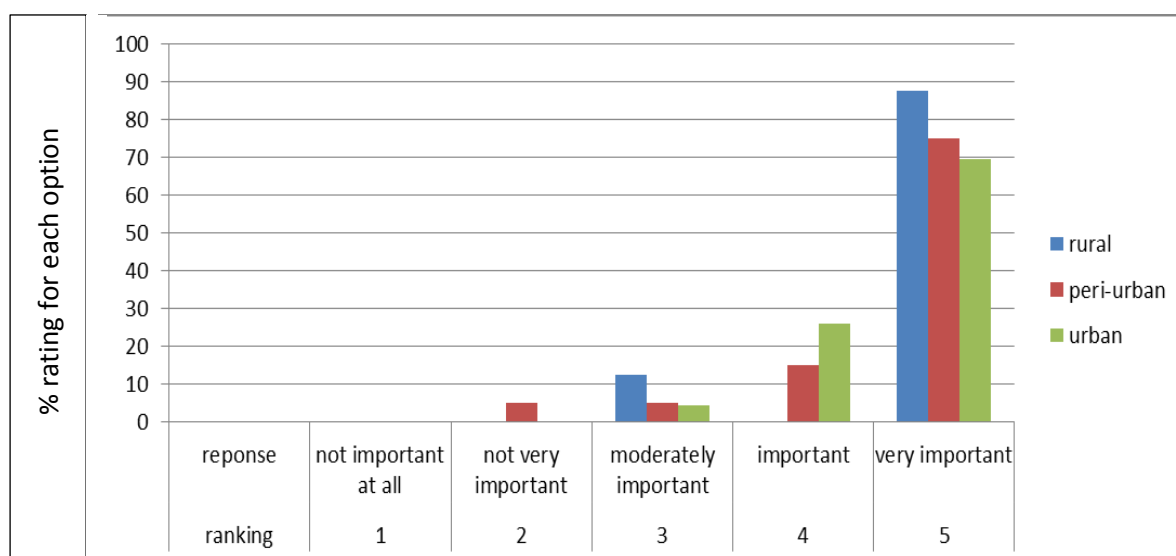
*'Greater value of the expertise of nursery staff by their political masters would be a supportive move.'* (female, 70-79)

*'There is great potential for a community nursery to deliver biodiversity conservation outcomes but there needs to be vision and commitment.'* (female, 60-69)

*'Council missed the opportunity to establish a much larger nursery due to limited economic reasons.'* (female, 60-69)

Question 23 asked the community nursery volunteers to rate the importance of Local Provenance plant supply for revegetation works on a scale of one (1) being 'not important' to five (5) being 'very important', and provided them the opportunity to make further comment. Fifty-one respondents answered this question giving an overall rating of 4.7/5 to the importance of using local provenance plants for revegetation works. Overall 93% of respondents emphasised the importance of local provenance plant supply for revegetation, with 18% indicating that it 'important' and 75% indicating that it was 'very important'. The responses to question 23 are shown in figure 33 which shows similar responses across all three nurseries.

This was the highest rated of the set of questions about biodiversity, coming just ahead of the nursery volunteers level of concern about biodiversity loss (4.6/5) and their rating of the importance of the community nursery in delivering biodiversity conservation outcomes (4.5/5).



**Figure 33: How the volunteers rate the importance of Local Provenance plant supply (%)**

In their comments on this question the respondents showed local provenance was an important consideration for them, and at least some of them were aware



of the complexities involved. Some indicated that without community nurseries local provenance plants would be difficult to obtain:

*'Provenance plants are critical to preserving biodiversity and the environment and plant and animal habitat. Timing of plant flowering and fruiting cycles are critical for birds and animals also bees.'* (female, 60-69)

*'Local provenance plants have good outcomes when put into the environment, and are the 'right plant, right place' in the local area.'* (female, 60-69)

*'It is the essence of biodiversity. (It) prevents the simplification and weakening of the landscape.'* (male, 40-49)

*'It is important to protect local biodiversity by protecting local genetic diversity. Balancing propagation techniques of seed vs cutting offspring should be considered.'* (female, 30-39)

*'Local plants have evolved to be successful in a specific environment, hence the need for local provenance.'* (female, 70-79)

*'This is a controversial topic but lean on the side of keeping genetics within the evolution of ranges.'* (female, 60-69)

*"As most of the Cumberland plain vegetation is gone, the emphasis should be on generic / local plant / animal community support; Use local species but don't expect a 'rebirth'.* (female, 60-69)

*'This is a major focal point for all our plant propagation.'* (male, 60-69)

*'Provenance is always important; [...] Community Nursery started this way and tried to foster this initiative.'* (female, 70-79)

*"It is likely that local plant species are only available because of efforts by community nurseries, i.e. not necessarily commercially available.'* (male, 60-69)

#### **5.4.8 Skills training within the Community Nursery**

Question 24 sought to identify the types of skills training that would be of greatest interest to community nursery volunteers. It asked them to rate their interest in five nominated training areas (plus 'other') on a scale of one (1) being 'no interest at all' to five (5) being 'very interested', and provided them the opportunity to make further comment. Not all the options were rated by the

respondents, and only eight respondents gave a rating to all six items. The nominated training areas were rated by between 43 and 49 respondents.

The respondents showed a strong interest in skills training, with the five nominated areas of skills training all being given a rating. The lowest ranking by the 45 respondents who rated this factor, was 4.3/5 for training in 'seed processing & storage', and the highest ranking was 4.6/5 for training in 'Native tree & shrub ID' by the 49 respondents who rated this item (figure 34).

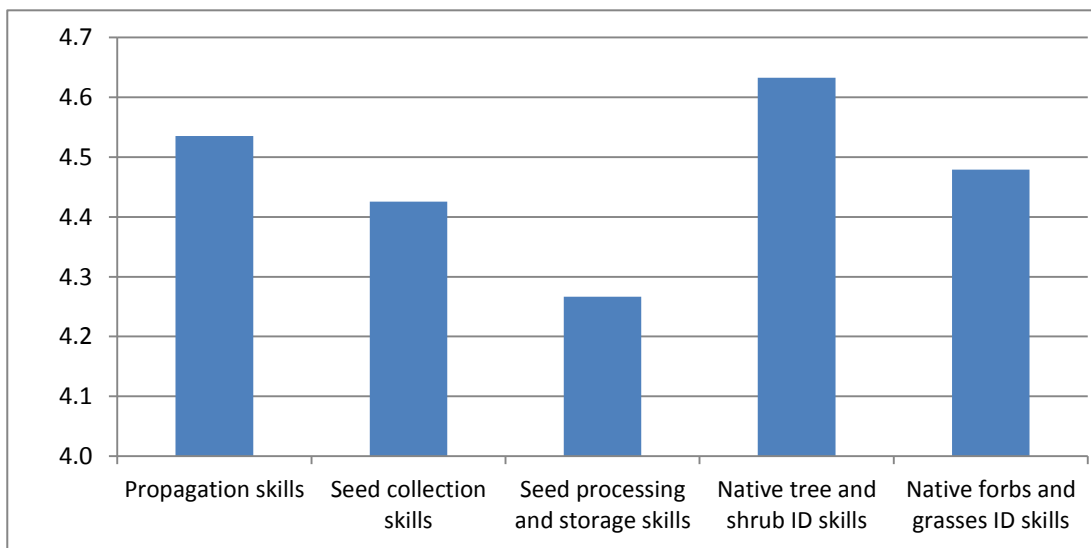


Figure 34: Skills training that is of greatest interest to the nursery volunteers

One respondent indicated their skills development had come from their own research efforts:

*'To date I have relied on my personal interest and research to further develop my skills.'* (female, 70-79)

Another respondent summed up the link between skills training and an ongoing engagement in the community nursery:

*'The more knowledge the more interest, that is, being involved.'* (female, 70-79)

While one respondent commented that the opportunity for skills training was available, several made particular reference to the skills training provided by their nursery manager / coordinator:

*'Skills training is available for us to take part in.'* (female, 50-59)

*'The Nursery Manager is important. Our manager does an excellent job in training and in engendering enthusiasm.'* (female, 60-69)

*'I think this is a lifelong activity! Our nurseryman is very knowledgeable and highly respected well beyond our volunteer group. He has taught me much over the years.'* (female, 70-79)

*'We have all these skills and use them constantly. The Nursery Manager has extensive knowledge and expects a high standard and is willing to teach these skills over and over.'* (female, 70-79)

Of the eight respondents who nominated 'other' skills training as important to them, four did not indicate what other training they were interested in. One made a generic comment that the more training the better, while another indicated a strong interest in training focussed on EECs (Endangered Ecological Communities) and threatened plants. Two indicated a strong interest in training on native fauna habitat and food preferences, and training on native insects and bees in particular.

#### **5.4.9 Summary**

The results from the case study show that the community nurseries volunteers represent an environmentally-aware, civic-minded, dedicated cohort in the community. They are generally active, older, retired or semi-retired, socially-engaged people with a significantly higher proportion being female. Two thirds of the respondents were over 60 years of age and 38% were over 70, with only 8% being under 50 years of age. Females strongly outnumbered males, especially in the 50-79 age range where they made up 60% of total volunteers compared to 27% for males. Fifty-eight percent of the community nursery volunteers surveyed reported that they were retired, and a further 4% reported being semi-retired. Of the 26% who reported that they were still working more than half were only working part-time. Significantly these figures were skewed by the urban community nursery where almost 40% of the volunteers reported they were still working, with 26% working part-time and 13% working fulltime. In contrast less than 10% of the peri-urban community nursery volunteers were still working, split evenly between those working part-time and those in fulltime employment.

Community nursery retention rates were very strong with 55% reporting that they had volunteered for more than five years, and a quarter reporting they had volunteered for more than nine years. A quarter of the community nursery volunteers report volunteering for more than 20 hours per month although the most common contribution (by 35% of volunteers) is one session (1-4 hours) per month. A high proportion of community nursery volunteers (44%) also volunteer with other NRM groups, predominately Bushcare or Landcare groups; while 39% reported they also volunteer with one or more non-NRM community groups. This indicates that community nursery volunteers have a high level of social engagement.

Their motivations for volunteering in the community nursery are primarily to help conserve biodiversity and this was clearly the major driver in their motivation to work in the community nursery. Ninety percent of the respondents rated their concern about biodiversity loss at 'high' to 'very high'. They show a strong awareness of the rationale behind use of local provenance plants for landscape rehabilitation and biodiversity conservation works and view their community nursery as playing an important role in supplying those plants. However their motivations also include an enjoyment of growing plants, a desire to increase their knowledge of native plants and to improve their propagation skills; and indicated a strong interest in further skills training. Time availability was rated as the most significant barrier to increased levels of volunteering by 38% of respondents with a further 10% rating it as quite significant. In contrast 38% indicated that time availability was not a significant barrier and a further 8% said time availability was only somewhat significant.

Most of the respondents reported an enjoyment of the social aspects of the community nursery and commented on how the community nursery brings people together, gives them a sense of belonging and fosters community spirit. A high percentage of respondents found their community nursery experience more satisfying, or much more satisfying, than other places where they volunteer; and the vast majority felt their volunteer contribution was quite valued or highly valued. A very high proportion also indicated the way the community nursery engaged volunteers was good or very good.

## **5.5 Summary of telephone interview responses**

Seven of the community nursery volunteer survey respondents indicated a willingness to participate in a telephone interview to provide further insights into their motivations and views on volunteering in the community nursery. Of these seven, two were from the rural/regional community nursery, three from the peri-urban community nursery and two from the urban community nursery. Six of the seven were female; four were in the 50-59 age group, one in the 60-69 age group and two in the 70-79 age group.

Four of those interviewed said they had been volunteering in the community nursery for less than a year, one reported volunteering in the community nursery for 5-8 years and one had volunteered in their community nursery for 12-19 years. Three of those interviewed said they volunteered 1-4 hours per month in the community nursery, three reported volunteering 5-8 hours per month and one volunteered 20-30 hours per month. All but one did not volunteer with other NRM groups. The questions asked during the telephone interviews are set out in appendix 1. Appendix 2 provides a tabulated summary of the telephone interview responses while appendix 3 provides the full responses from the telephone interviews.

Although limited in number the telephone interviews do provide further insights into the themes identified through the survey and branch manager and nursery coordinator interviews. They reiterate the key motivations: helping the environment, growing local provenance plants for revegetation, learning new skills, meeting new people, working with like-minded people, and enjoying the social interaction. Overall they reported a strong sense of achievement and high levels of satisfaction. They were emphatic about the worth, value and importance of volunteering in fostering community spirit, getting people engaged, forging links between people and creating a sense of belonging. Most of those interviewed felt their volunteer contribution was valued and felt appreciated. For most of them a lack of available time was the main barrier to increased volunteering in the nursery; although, transport problems and health issues were also mentioned. While mostly retired people they reiterated that they had other commitments and other things to do in their lives.

## 6 ANALYSIS OF VOLUNTEER SURVEY RESPONSES

This analysis of community nursery volunteer responses is set in the context of volunteering for conservation, volunteering through local government sponsored NRM groups and volunteering in the wider revegetation nursery movement. It has been reported that a shortage in availability of local provenance plants for habitat restoration is a widespread problem across Australia (Australian Government 2011c) and it is also clear that much more remains to be done if this situation is to be addressed (ANPC 2016).

At least 150 Landcare groups in Victoria established indigenous plant nurseries to supply local provenance plants (Youl, Marriott & Nabben 2006) although not all of these may have continued. **Table 2** lists 28 of the medium to large Landcare/ revegetation nurseries that are currently operating and have an internet presence. Conservation groups in the San Francisco Bay area provide another example of the movement in California to establish community-run plant nurseries to propagate local provenance native plants for environmental restoration (Serrill 2011). This trend is also evident across northern Australia where Aboriginal community nurseries are being established to provide local provenance plants, especially culturally important bush food and medicine plants for environmental restoration (CAEPR 2006, Dambimangari Aboriginal Corporation 2012, Gooniyandi Aboriginal Corporation & Kimberley Land Council 2015, Marshall 2016).

The 2012 survey of conservation volunteers in the Sydney region (Hawkesbury Nepean Catchment Management Authority 2013) found that the large majority (87%) volunteered through local government, with 90% of their volunteer hours being spent on Bushcare/ planting work but only 7% of volunteer hours spent on community nursery work. This is significantly higher than in New Zealand where Peters (2015) found over 85% of environmental volunteer effort was focussed on weed control and revegetation activities and only 2% on plant propagation activities.

Understanding of the character, motivations, needs and challenges of the volunteers who are helping to grow local provenance plants for conservation can provide useful insights into improving their engagement and retention; building capacity and

fostering this important 'movement'. This case study does not attempt to probe the characteristics of Landcare nursery volunteers nor those who volunteer in Aboriginal community nurseries; however these are also areas that should be researched.

### **6.1 Community nursery volunteer demographics**

The survey of volunteers from the three case study community nurseries showed they are mainly older retired people, with a significantly higher proportion being female. Two-thirds of the community nursery survey respondents were over 60 years old and 38% were over 70 (**Figure 7**). A further quarter of the volunteers were in the 50-59 age group with only 8% being under 50, yielding a mean age for the respondents of 64.5. This is a much older cohort than in New Zealand where only 13% were over 66 years of age (Peters 2015) and somewhat older than the Bushcare volunteers in the Shoalhaven shire where 63% were over sixty and 21% were over 71 (Rankin 2013). The study found the rural/regional community nursery had an older cohort of volunteers while all the respondents who were less than 50 years of age were volunteers at the urban community nursery (**Figure 9**).

Over 60% of the nursery volunteer respondents were female (**Figure 8**) and females were much more strongly represented in the 50-79 age groups than men (**Figure 7**), which contrasts with the ABS 2010 survey data for the general population which shows (**Figure 1**) that men made up a higher proportion of general volunteers in the 50-75 age range (ABS 2011). This may be influenced by the greater concern about environmental problems shown by women than men (75:67%), by people in the 55-64 age group compared to the general population (36:23%) and by retirees compared to the general population (31:23%) that was found in a NSW random telephone survey on environmental attitudes (DECCW 2010). The segregated data also showed a higher proportion of males volunteered with the urban community nursery and a lower proportion of males volunteered at the rural/regional community nursery (**Figure 10**).

Fifty-eight percent of the community nursery volunteers surveyed reported that they were retired, and a further 4% reported being semi-retired. This is much higher than the general population of volunteers where 37% reported being retired (Volunteering Australia 2016) and significantly higher the Bushcare volunteers working for Hornsby

Council, where 46.4% were retired and 4.9% were semi-retired. Of the 26% community nursery volunteers who reported they were still working more than half were only working part-time, whereas 28.1% of Hornsby Bushcare volunteers were working fulltime and 16.7% working part-time (Hornsby Shire Council 2009). Only two percent of the community nursery volunteers reported being students, the same proportion who reported that they were at-home carers. Five percent reported that they were seeking work and two percent did not specify their employment status (**Figure 11**).

- Thus the average community nursery volunteer is more likely to be older, more likely to be female, and more likely to be retired than volunteers in other sectors. It would be sensible for nursery coordinators to consider developing recruitment and retention strategies focussed on the particular needs of retired older woman.
- Strategies aimed at broadening the community nursery volunteer base should examine the factors that might increase the recruitment and retention of male volunteers, and those that might increase volunteering by younger people.

## **6.2 Length and extent of volunteering effort**

### **Length of volunteering effort**

Fifty-seven percent of the community nursery respondents reported they had volunteered there for more than five years, with 27% reporting they had volunteered for more than nine years. This is very similar to the Hornsby Bushcare volunteers, sixty percent of whom had volunteered for over five years, with 28.2% having volunteered for more than nine years. Rankin (2013) found 52% of respondents in the Shoalhaven Bushcare volunteer survey had volunteered for more than six years and 48% had volunteered from 1-5 years. None of Rankin's respondents were 'new' volunteers while 5.3% of the Hornsby Bushcare volunteers described themselves as 'new' and 14.1% had volunteered for 1-2 years and 18.3% for 3-4 years. The Volunteering Australia (2016) survey found that some 40% of general volunteers had volunteered for over five years, 36% for 1-5 years and 24% for less than a year. A similar proportion (24%) of respondents in the community nursery survey described themselves as new volunteers and almost 20% reported they had volunteered for 1-4 years (**Figure 13**).



A quarter (24%) of the respondents who describe themselves as 'new' community nursery volunteers, and the 18% who had volunteered in the community nursery for 1-4 years, reported they also volunteer with other NRM groups (Bushcare, Landcare, etc.) which suggests that this may be a significant recruitment channel. A significantly smaller percentage (17%) of 'new' and '1-4 year' community nursery volunteers reported also volunteering for other non-NRM groups compared to the longer-term (5+ years) community nursery volunteers, where 24% reported volunteering with other non-NRM groups.

- This suggests that long-term volunteering in the community nursery is associated with developing wider community networks and fostering a broader volunteer ethic.

The data from the rural/regional nursery does skew the results somewhat in that it has only been operating for seven years, and with this excluded, almost 60% of respondents had volunteered for more than five years, with 31% having volunteered for over nine years.

- This indicates that community nursery retention rates, like those of the Bushcare volunteers, are some 50% better than in the general population of volunteers and points to the strong level of loyalty/commitment displayed by community nursery volunteers.

### **Extent of volunteering effort**

The ABS 2010 data showed that 35% of general adult volunteers volunteered at least once a week while a further 27% volunteered less frequently, but at least once a month. The survey of Hornsby Bushcare volunteers showed that over 21% volunteered at least weekly while 47% volunteered at least monthly. The Australian Bureau of Statistics (ABS 2007) estimated the median volunteer time donated to the Australian community in 2006 at 56 hours per volunteer, an average of 4.7 hours per month; whereas the 2011 Productivity Commission report (Australian Government 2011) found that two-thirds of those reporting voluntary activity participated at least once a month, with most contributing 5-10 hours per month. Data from the Volunteering Australia (2016) survey of general community volunteering showed that weekly

volunteering was the most common; with the bulk of volunteers volunteering at least monthly (**Figure 2a**) and the most common extent of volunteering (~29% of respondents) reported as being 200+ hours per annum or 4 hours/week (**Figure 2b**). This is considerably higher than that reported by ABS (2007) and the Productivity Commission (2011).

The Volunteering Australia survey also found that most volunteers (76%) had a preference for 'ongoing volunteer roles performed regularly', with most interested in volunteering in 'community service' or 'education' (Volunteering Australia 2016, p. 12). In contrast to the latter point, the ABS (2015) data found most volunteering (31.1%) is in 'sport and physical recreation' with 'education and training' second (23.9%) and 'welfare/community' third (21.2%). Direct comparison is difficult however since the Volunteering Australia survey questioned volunteers on the sector they 'would be most interested in volunteering for in the future' and offered respondents twenty-three categories to choose from, compared to the eleven categories in the ABS survey (**Table 1**). Also, several of the Volunteering Australia categories were very closely related e.g. 'disaster relief' and 'emergency response'; 'arts & culture' and 'museums & heritage'; 'community service', 'seniors', 'migrant support', 'family support' and 'disability services'.

Rankin (2013) found that the average frequency of volunteering by Shoalhaven Bushcare volunteers varied widely, with 53% of respondents volunteering five or less hours per month, but she reported a mean participation of seven hours/month, consistent with the productivity commission data. Some 35% of the respondents in the Volunteering Australia (2016) survey reported contributing 4 or less hours/week (>16 hours/month). The 2012 data on environmental volunteering in the Sydney region collected by the Hawkesbury Nepean Catchment Management Authority (2013) found an average annual contribution of 'regular committed volunteers' was 24 hours per annum (~ 2 hours/month), which is significantly less than that identified in the other studies, casting some doubt on its reliability.

Of the 50 community nursery volunteers in the case study who reported their average number of volunteer hours, 45% volunteered over 12 hours/month and 25% volunteered more than 20 hours/month (**Figure 15**).

- On average the community nursery volunteers' contribution is on par with the contribution of voluntary hours reported in the Volunteering Australia (2016) survey; considerably more hours per month than the average Australian volunteer reported by the ABS (2007) and Productivity Commission (Australian Government 2011); and significantly more than the average Bushcare volunteer (Rankin 2013).

In the volunteer telephone interviews it was clear that, although the community nursery volunteers are mainly older retired people, they generally live very busy lives and report 'lack of time' as the major impediment to volunteering more hours. Some community nursery volunteers reported that other commitments limited the times when they could volunteer in the nursery, and they would volunteer more hours if there were other days in the week when the community nursery was operating. Transport issues were an impediment for a small number of volunteers. Many of respondents (44%) reported that they also volunteer with other Natural Resource Management groups (Bushcare, Landcare, etc.) or with non-NRM groups (39%).

- That is, for more than 80% of the respondents, their Community Nursery volunteering effort is just one of their volunteer commitments. This is consistent with the finding by Rankin (2013) that a quarter of her respondents volunteered with more than one Bushcare group.

### **6.2.1 Volunteering with other NRM groups**

Further analysis was made of the 44% percent of the community nursery respondents (24 volunteers) who reported volunteering with other natural resource management (NRM) programs, such as Bushcare, Landcare, and 'Friends of' groups (**Figure 17**).

Within this cohort, 42% volunteered with Bushcare groups, 17% with Landcare groups and a further 17% volunteered with both a Bushcare group and a Landcare group (76% overall). Eight percent volunteered with another type of NRM group or with the National Parks and Wildlife Service. Eight percent reported volunteering at a second Community Nursery (**Table 6**). Like the Community Nurseries, Bushcare groups operate under the auspices of Local Government Authorities, with the volunteers primarily working within council-owned or council-managed crown bushland reserves. The Bushcare groups operate under council protocols, workplace health and safety regimes

and council insurance arrangements. Often Bushcare groups are supported in the field by council Bushcare officers who function as professional ‘bush regenerators’.

- This shows that there are strong synergies and incentives for Bushcare / Landcare volunteers to also become community nursery volunteers, and help grow the plants that they will later plant on their Bushcare sites, where they may have also collected the seed used in growing those plants.

Landcare groups are generally auspiced by state government agencies such as Local Land Services (formerly Catchment Management Authorities) or are standalone incorporated and grant-funded not-for-profit entities, which undertake NRM activities on private land where there is a distinct public benefit. Landcare groups are very diverse however, with some composed entirely of collaborating primary producers undertaking landscape-scale NRM works, and others operating like a self-directed Bushcare group. Many Landcare groups have also established Revegetation Nurseries that have many similarities with council-operated Community Nurseries, but run on a ‘business-like model’ with nursery sales paying nursery staff wages and often also supporting their other NRM activities.

- The survey data indicates that the community nursery volunteers display a very strong commitment to undertaking practical hands-on activities directed towards protecting and enhancing biodiversity values in their local area/community.

### **6.2.2 Volunteering with other community groups**

Of the 39% of the respondents who reported volunteering with non-NRM groups, almost a third reported volunteering with two or more other groups (**Table 7**). The respondents listed a very diverse list of sixteen types of non-NRM community groups that they also volunteer with.

- This indicates that the Community Nursery volunteers are strongly networked across a broad range of other community groups and that they exemplify a strong volunteer ethic / community spirit.

This is consistent with the ABS 2010 data which showed that volunteers were more likely to be involved in other aspects of community life than those who hadn’t

volunteered in the previous year, and is consistent with research by Reed & Selbee (2000) which found volunteers have a distinctive worldview which involves a concern for the common good and they displayed high levels of civic participation.

### **6.3 Reasons for volunteering in the community nursery**

Key motivators for older volunteers are 'helping values, social aspects of volunteering, and opportunities to make a contribution to their community or society, to use their skills or share knowledge, to learn, develop new skills and be intellectually stimulated, or to feel good or feel needed' (Petriwskyj and Warburton 2007, p. 5). This is consistent with the 41% of respondents in the Volunteers Australia (2016) survey who indicated that 'volunteering allows them to give something back to the community', and is consistent with the finding by Rankin (2013) that the strongest motivators for Bushcare volunteers were a desire to 'help restore natural areas', 'help conserve biodiversity', 'to make a difference' and to 'do something important'. It is also consistent with the motivations reported by Ryan et al (2001), Halpenny & Caissie (2003), Bruyere & Rappe (2007), Hornsby Shire Council (2009), and Constable (2015).

- The community nursery survey found that 'helping to conserve biodiversity' is the strongest motivation for the nursery volunteers, followed by an 'enjoyment of growing plants' and the 'desire to gain knowledge about native plants' and to 'gain propagation skills' (**Figure 19**). Rating lower, but still a very strong motivator was their enjoyment of the 'social interaction' that they experience at the community nursery, which reflects the motivations identified in the scholarly literature.

Twenty percent of the respondents indicated there were 'other reasons' for their volunteering in the community nursery but this was generally in addition to the reasons referred to above. Among the other reasons listed were to 'contribute and be connected to the environment and the local community', 'doing something valuable for the local community' and 'building community spirit'. Of those respondents for whom helping to conserve biodiversity was a very strong motivating factor for volunteering in the nursery, several provided additional comments on their motivations, which included concern for the environment and acting locally as a way to

contribute to global action for a better environment and as a response to climate change. A comment that summed up the general sentiment was:

*'It is helping the environment in the 'think global act local manner'. It builds community and ... bolsters spirits often discouraged by never-ending defeats in environmental protection efforts'. (male, 40-49)*

The telephone interviews provide further insights into the reasons the respondents volunteer in the Community Nursery. A major theme was a love of gardening and learning about / growing native plants / local provenance plants, combined with their concern for the environment. Another major theme from the telephone interviews was the social interaction. Some comments that exemplify this theme are:

*"a nice social space and a good place for social involvement ... I find it very rewarding"* (female, 60-69)

*"there is no onus for set times or commitments, you just turn up. I like working with people - it's enjoyable, very enjoyable"* (female, 50-59)

*"I'm not doing any other volunteering. ... The Community Nursery has been the primary thing, it's very satisfying. Excellent really!"* (male, 70-79)

### **6.3.1 The community nursery volunteer experience**

Several questions sought information about the respondents' volunteer experience in the community nursery. Question 10 asked them how their volunteer experience in the community nursery compares with other areas in which they volunteer and question 15 asked them to rate the quality of their volunteer experience in their community nursery. Question 13 asked them to rate how they thought their volunteer contribution in the community nursery was valued and question 16 asked them to rate how well the community nursery engages volunteers. Overall 30% of the respondents rated their volunteer experience in the Community Nursery as 'much more satisfying' and 40% as 'more satisfying' than other volunteering they undertake, with 20% rating it as 'similar' and only 10% rating their experience in the community nursery as either 'less satisfying' or 'much less satisfying' (**Figure 20**). Most of the respondents who were dissatisfied with their volunteer experience in the community nursery were from the rural/regional nursery (**Figure 21**). Three-quarters of the respondents from the other

two nurseries reported being either 'more satisfied' or 'much more satisfied' compared to other areas they volunteer.

In contrast to question 10, question 15 did not seek a comparison with the respondent's other volunteer experiences but a straight-forward rating of the quality of their volunteer experience in the community nursery on a scale of 'very poor' (1) to 'very good' (5). Overall 86% of the survey respondents were very happy with their volunteer experience in the community nursery, with 65% describing it as being 'very good' and 21% describing it as 'good'. Only 8% were dissatisfied with their volunteer experience in the community nursery with 4% describing it as 'poor' and 4% as 'very poor'. A further 6% described their volunteer experience in the community nursery as 'average'. Examining the segregated data (**Figure 26**) shows much higher dissatisfaction levels at the small rural/regional nursery where half the respondents rated their volunteer experience as either 'very poor' or 'average', although the other half rated their experience as 'very good'. If the responses from the rural/regional nursery are excluded then an outstanding 93% of the respondents considered their volunteer experience in the community nursery as 'good' to 'very good'.

A number of factors contribute to the quality of the 'volunteer experience' one of which is how much the volunteers feel that their contribution is valued by the institution they are volunteering with, and by the paid staff that manage them. Question 13 asked the volunteers to rank how they thought their contribution was valued on a scale from 'not valued at all' (1) to 'highly valued' (5). Twelve percent of respondents perceived that their contributions were not valued appropriately comprising 4% who believed it was 'not valued at all' (1) and 8% who believed it was 'not very valued' (2). In contrast 82% were happy with how their volunteer contribution is valued (**Figure 23**), with 40% reporting they felt it was 'quite valued' (4) and 42% believing their volunteer contribution is 'highly valued' (5). When the data is segregated to the separate nurseries (**Figure 24**) it shows that half of the respondents from the rural/regional community nursery did not believe their contribution was adequately valued with a quarter believing their contribution was 'not valued at all' (1) and a quarter believing it was 'not very valued' (2). In contrast 91% of the respondents from the urban community nursery felt their contribution was adequately valued, with

39% believing it was 'quite valued' and 52% believing it was 'highly valued'. Some 84% of respondents from the peri-urban nursery felt their volunteer contribution is adequately valued, with 53% believing it is 'quite valued' and 32% believing their volunteer contribution is 'highly valued'. How well an institution engages volunteers is another factor which contributes to the level of volunteer satisfaction. Question 16 asked the volunteers to rate the way the Community Nursery engages volunteers on a scale from 'very poor' (1) to 'very good' (5). Overall 81% of respondents were happy with the way the Community Nursery engaged volunteers, 49% rating the quality of volunteer engagement as 'very good' and 32% rating it as 'good'.

- The responses to this set of questions about the volunteer experience is a very strong endorsement of the community nurseries as a volunteer space, that delivers an enjoyable volunteer experience, that is more satisfying than other volunteer spaces, that effectively engages them in the workplace and that makes the volunteers feel valued.

Additional descriptions by the respondents of the nursery volunteering experience such as 'very rewarding', 'very enjoyable', 'very satisfying' and that it 'bolsters spirits' reinforce what the data is saying and helps to explain the high volunteer retention rates achieved by the community nurseries.

### **6.3.2 Value of volunteering to health and community building**

As referred to in section 2.3.2, the value of volunteering includes 'personal development and recreation within a community and helps to develop and reinforce social networks and cohesion' (ABS 2011). Research has also shown that volunteering 'enhances quality of life and life satisfaction and is associated with higher levels of self-esteem as well as lower reports of loneliness and isolation', and also contributes to 'feelings of empowerment' (Cook & Sladowski 2013). One respondent commented 'as I'm getting older and no longer working full time, it's important for me stay active and be productive'.

- This suggests that the community nursery volunteers gain physical health benefits from volunteering in the community nursery.



Of particular significance for older people, research indicates that volunteering 'appears to reduce the risk of dementia and promote brain health' (ibid). This is consistent with the comments by a survey respondent on the mental health benefits of volunteering at the Community Nursery:

*"I had to stop work due to suffering depression, so I started at the Community Nursery to socialise with like-minded people with an environmental bent"*  
(male, 70-79)

Another way volunteering benefits the wider community is that volunteers are reported as being 'more delighted, pleased or mostly satisfied' with their lives, when compared to non-volunteers (Australian Government 2011), which lends weight to the value of volunteering in the community nursery for reasons of mental health.

- Scholarly research has highlighted the mental health benefits of volunteering, thought to be linked to the release of endorphins that results from 'a sense of being of value to another' and that the release of endorphins 'has a calming effect contributing to a positive outlook' (Cook & Sladowski 2013).

Questions 11 and 12 sought to identify the volunteer's perceptions on the value of volunteering, both in a general sense – as in the value of volunteering to the community as a whole – and in a particular sense – as in what they themselves gain from volunteering at the community nursery. Comments from the survey respondents such as: 'If more people were to volunteer their time then the whole community benefits' indicates a perception that more people should volunteer, while another comment: 'It works for some but many people are too stretched to include it in their lives, even though they might like to volunteer' indicates an appreciation that not everyone is in a position to volunteer. Some of the respondents commented on the broader value of volunteering to society: 'It contributes to ownership of local issues' and pointed to the: 'additional benefits from social/ knowledge sharing re issues'. In regard to promoting social cohesion one respondent commented: 'It's important for diverse demographics to mix, learn from, tolerate, and appreciate what each has to offer', although this view was qualified by another respondent: 'the social group is quite diverse, however sometimes very dogmatic political views can reduce the group's cohesion'.

The responses to this question from the telephone interviews exemplify how strongly community nursery volunteers value the act of volunteering as a means of fostering community spirit. They highlight how volunteering 'brings people together' and helps to 'forge links with people who have a different view of life and different backgrounds'. Further that volunteering 'brings little communities together' and helps to 'create a tribal structure and a sense of belonging' and engages people who might otherwise be 'sitting at home alone and feeling isolated.'

- The results show that community nursery volunteers see volunteering as being very important to fostering community spirit and speak to the value of volunteering in building community connectedness.

A qualification to this came from a respondent who had been volunteering at the small rural/ regional community nursery but who became frustrated due to being unable to 'find a voice' as 'the biggest voice was dominating' and as a result stopped volunteering. They commented that 'some people are better at engaging volunteers than others.'

Another theme that emerged is the satisfaction that comes from 'making a difference' and 'doing something for the community' which was a theme that also emerged in response to question 12. Question 12 asked the volunteers to rate five factors relating to what they personally gain from volunteering, from a rating of 1 at the lowest (a minor factor) to a rating of 5 at the highest (a major factor). As shown in **Figure 22** the respondents rated the satisfaction they gained from 'helping the environment' most highly (4.7/5), followed by the 'opportunity to gain new skills' (4.4/5) and 'gaining indigenous plant knowledge' (4.3/5). The respondents also rated 'enjoy the social interaction' fairly highly (4.2/5) while 'the opportunity to teach others' was a moderate factor, rated at 3.4/5.

In relation to helping the environment, further comments made by survey respondents included: 'It gave me the opportunity to contribute in a meaningful way' and 'as an environmentalist I see this as a high priority with long lasting effects.' As for the social interaction factor, further comments included: 'I get to mix with different people who aren't part of my regular work/ family/ friends circle', 'working with like-minded folk'.

In the telephone interviews the respondents were questioned on the importance of factors such as the social interaction, opportunity to learn new skills and to gain Indigenous plant knowledge, the opportunity to teach others, and helping the environment as things they personally gain from their volunteering at the community nursery. Responses such as ‘all the things listed are at the highest scale of importance’, ‘all the factors listed cover the reasons I volunteer at the nursery’ and ‘all those things are all very important’ demonstrate the volunteers feel they do gain something of personal value from their volunteering at the community nursery.

‘Looking after the environment’ was a major theme highlighted by those interviewed (‘I get a lot of satisfaction from knowing I am contributing to looking after the environment’), as was learning more about indigenous plants (‘for me, learning about native plants is very important’) and learning new skills (‘I have learnt a lot in the community nursery’). The importance of the social interaction gained through volunteering at the community nursery was highlighted though comments such as ‘I’ve met a fantastic group of people and made some terrific friendships’.

These results are consistent with those reported by Ryan et al (2001), Bruyere & Rappe (2007), Hornsby Shire Council (2009), and Rankin (2013).

### **6.3.3 Barriers to volunteering in the community nursery**

Petriwskyj & Warburton (2007) undertook a literature review on volunteering by seniors and reported that ‘studies on motivations for volunteering are quite numerous and cover a broad range of contexts and specific volunteering areas’ but indicate that there are ‘far fewer studies investigating the barriers to volunteering’. They also express a concern about the ‘lack of rigorous attention to what stops people from volunteering, as well as what motivates them’.

Two questions in the community nursery volunteer survey aimed to ascertain the barriers to volunteering as well as the things that might encourage nursery volunteers increase the amount of time they volunteer in the nursery. Note these questions related to barriers affecting *existing* volunteers rather than barriers that might inhibit *potential* volunteers. Question 14 asked the volunteers to indicate how significant a

range of factors were in limiting their capacity to volunteer in the nursery and Question 17 asked the volunteers what would encourage them to volunteer more hours in the community nursery. As shown in **Figure 25** time availability is the most significant factor for almost half of the nursery volunteers, with 38% of respondents rating time availability as a very significant barrier and 10% rating it quite significant. It should be noted that although the bulk of the community nursery volunteers report being retired or semi-retired, their other volunteer commitments are likely to be a factor in their lack of available time, since 44% of the respondents report volunteering with other NRM groups and 39% indicate they volunteer with other (non-NRM) community groups, some with several other groups. This is consistent with the ABS (2011) report that showed volunteers are often involved in other aspects of community life.

- For the community nursery volunteers who are contributing as much time as they currently have available (~ 48%) the best strategy for the coordinators would be to focus on their retention in the nursery by making them feel valued and proud of the contribution they are making through their volunteer efforts.

In contrast, time availability is 'not significant' for 38% of the respondents and only 'somewhat significant' for a further 8% of respondents. Of this cohort, a third of the respondents listed transport issues or finances as significant barriers. This is supported by the Volunteering Australia (2016) research which found that access to transport was in the top eight barriers to volunteering listed by ongoing volunteers and that 60% of volunteers incurred out of pocket expenses through their volunteering role, although only 18% of these requested reimbursement.

- For some 25% of the community nursery volunteers there would seem to be no identifiable barriers to them volunteering more time in the community nursery. This highlights that there is an opportunity to engage a significant cohort of the volunteers more fully in the community nursery.

As shown in **Figure 27** more skills training and more flexible opening hours were ranked the highest overall as the factors with greatest potential to encourage the volunteers to commit more time to the nursery. Importantly, these factors rated highly

within the cohort that indicated time availability is not a barrier to their volunteering effort.

- This indicates that a cohort of volunteers who have the capacity to contribute more time to nursery might be encouraged to volunteer increased hours if more skills training and more flexible opening hours were on offer.

This is consistent with the study of Hornsby Bushcare volunteers (Hornsby Shire Council 2009) who rated 'learning / gaining new skills' as their fourth strongest motivation and with Rankin (2013) who found that a third of Shoalhaven Bushcare volunteers reported a desire for improved training. Question 24 sought to identify the types of skills training that would be of greatest interest to community nursery volunteers. Their responses are shown in **Figure 34** which indicates that training in native tree and shrub identification (4.6/5) is of greatest interest to the respondents followed by additional propagation skills (4.5/5) and native forbs and grasses identification (4.5/5). Seed collection skills were ranked 4.4/5 with seed processing and storage skills training coming last at a quite strong 4.3/5.

- Overall the respondents showed a very strong interest in skills training, and community nursery coordinators would be well advised to consider offering volunteer training in all the skills areas identified over a timeframe consistent with their budgetary constraints.

#### **6.3.4 Biodiversity loss and the role of community nurseries**

The interviews with the council environment/sustainability branch managers indicate that a desire to improve the availability of local provenance plants was a major factor in the decision to establish their community nursery, along with support for the council's Biodiversity Strategy and to provide plants for the Bushcare program (urban and rural/regional). Other significant factors included increasing volunteer opportunities and providing a location for local provenance seed storage. All three community nursery coordinators/ managers reported their community nursery has a very strong focus on biodiversity conservation, grows a diverse range of trees, shrubs and groundcovers (rural/regional: 100+ species; peri-urban: 292 species; urban: 143

species) and that all (or almost all) of the plants they produce are grown from local provenance seed sources.

All three council branch managers reported that their council had established environment divisions/ branches in the mid to late-1990s, with an environmental compliance role initially, but with the later addition of State of the Environment Reporting. From 2009-2011 all three councils underwent restructuring which saw their environmental compliance role transferred and their division/branch refocus on implementation of environment and sustainability policies and strategies.

It is likely that some of the drivers for these changes were the legislative amendments to the local government environmental management powers and obligations between 1993 and 2009, as outlined by Kelly (2011) and referred to in section 2.2.3; which also reflected the increased emphasis on local government's role in biodiversity conservation articulated by the Rio Declaration (1992) with its Agenda 21, and the Convention on Biological Diversity (1993) with its Aichi Biodiversity Target 17; the adoption in 1998 of the National Local Government Biodiversity Strategy along with Australian Local Government Association lobbying for an increased role in biodiversity conservation and better resourcing; and the new capacity for LGAs in NSW to raise revenue through environmental levies as discussed by Bates and Meares (2010). It may also have been driven by the increasing expectations from the local community, including the Landcare and Bushcare movement, increasing federal government funding for Landcare and Bushcare, coupled with the development of environmental program support resources, such as those provided by the Volunteer Coordinators Network.

Questions 18-23 in the community nursery volunteers survey focussed on the respondent's level of concern about biodiversity loss, their perception of the level of general public awareness about biodiversity loss in Australia, their assessment of the biodiversity values within their shire and their council's record in delivering conservation outcomes, their perception of the importance of local provenance plant supply for revegetation and the rating they give to the importance of the community nursery in delivering biodiversity outcomes.

- The responses show that the community nursery volunteers have a high level of concern about the loss of biodiversity, they consider local provenance plant supply for revegetation as being very important for biodiversity conservation and they perceive their community nursery as playing an important role in addressing biodiversity loss on a local level. They see their volunteering activity in the community nursery as both effective and beneficial and this contributes to their ongoing engagement as community nursery volunteers.

**Figure 29** graphs the volunteer's responses to these questions on biodiversity. A very significant 90% of the respondents reported that their level of concern about biodiversity loss in Australia was either 'high' (18%) or 'very high' (72%) with additional comments pointing to the explicit link between this and their motivation to volunteer in the community nursery (see below). Likewise 93% of the respondents were of the view that local provenance plant supply was important in revegetation with 18% rating it as 'important' and 75% rating it as 'very important' (**Figure 33**).

In their further responses to this question the community nursery volunteers showed a high level of familiarity with the ecological basis for using local provenance plants in revegetation, as exemplified by comments such as:

*'Provenance plants are critical to preserving biodiversity and the environment and plant and animal habitat. Timing of plant flowering and fruiting cycles are critical for birds and animals also bees.'* (female, 60-69)

There was awareness among the survey respondents that this was the rationale behind setting up the community nursery in the first place:

*'It is likely that local plant species are only available because of efforts by community nurseries, i.e. not necessarily commercially available.'* (male, 60-69)

And this concern was a key driver for the volunteer's involvement in the community nursery:

*'My concern about biodiversity loss in urban region is the main reason I began volunteering at community nurseries.'* (female, 30-39)

*'So much vegetation is being removed, particularly trees; this is my small contribution to offset this.'* (female, 50-59)

This is consistent with research by Buizer, Kurz and Ruthrof (2012) which found that the ecosystem restoration volunteers they interviewed had a very good understanding on the reasons for using local provenance plants. On the question about the level of general community awareness of biodiversity loss in Australia, 70% of the community nursery respondent's rated it as 'low' to 'very low', while 26% of respondents rated it as being 'moderate'. Most of the additional comments provided by respondents to this question highlight the importance of education to raising the level of awareness in the general community about biodiversity loss:

*'It is an important entry point for residents to discover importance of indigenous plants ... providing important educational tools at these plant giveaway days.'* (male, 40-49)

*'The Community Nursery plays an important part in community education; the public learn about the environment during the plant giveaway days.'* (male, 70-79)

There is evidence that this community education role is succeeding, at least for the peri-urban community nursery, since the coordinator reports a high demand for local provenance plants from ratepayers coming to collect their plants under the council's free plants scheme.

### **6.3.5 Summary**

Community nursery volunteers represent a small but vital element of conservation volunteers and understanding the character, motivations, needs and challenges of these volunteers can provide useful insights into improving their engagement and retention, and assist in building the capacity and fostering this important 'movement'.

- 1) The average community nursery volunteer is more likely to be older, more likely to be female, and more likely to be retired than volunteers in other sectors. Thus recruitment and retention strategies should probably focus more strongly on the needs of retired older women;
- 2) For more than 80% of community nursery volunteers it is just one of their volunteer commitments. Community Nursery volunteers are strongly networked across a broad range of other community groups and they exemplify a strong



volunteer ethic / community spirit, which increases with long-term volunteering in the community nursery. This community engagement / social connectedness aspect should be highlighted to council managers and Councillors as further evidence of the value of community nurseries to the wider community;

- 3) Volunteer retention rates in the community nurseries are 50% better than that found in the general population of volunteers, which points to the strong level of loyalty/commitment displayed by community nursery volunteers. The volunteer experience is a very strong endorsement of community nurseries as a volunteer space that delivers an enjoyable volunteer experience; one that is more satisfying than other volunteer spaces and which effectively engages volunteers and makes them feel valued. These are crucial factors that need to be taken into account in any planned expansions, refurbishments or relocations to ensure the nurseries remain 'volunteer friendly' and a satisfying place for volunteers to work;
- 4) The community nursery volunteers have a high level of concern about the loss of biodiversity. They consider local provenance plant supply for revegetation as being very important for biodiversity conservation and they perceive their community nursery as playing an important role in addressing biodiversity loss on a local level. This is an aspect that should be highlighted in any recruitment drive for volunteers;
- 5) Legislative changes in the environmental responsibilities of local government agencies, along with increased requirements from funding agencies to use local provenance plants in landscape rehabilitation, seems to have been a key driver for the establishment of community nurseries. In this regard they reflect an increased role of local government in biodiversity conservation, as articulated by various international conventions and by national and state biodiversity strategies. The local government agencies operating the case study community nurseries report an ongoing commitment to their continuation and anticipate investing in moderate expansions, if not in the nursery footprint then in the infrastructure or facilities;
- 6) Community nursery volunteers display a very strong commitment to undertaking practical hands-on activities directed towards protecting and enhancing biodiversity values in their local area/community, and this is the strongest

motivation for the nursery volunteers. There are strong synergies between community nurseries and Bushcare /Landcare, and incentives for Bushcare /Landcare volunteers to also become community nursery volunteers, to help grow the plants that will later be planted on Bushcare sites, which may also have been the source of the seed used for growing the plants. There is value in promoting these synergies / linkages through combined Bushcare site and community nursery tours;

- 7) On average the community nursery volunteers' contribution is on par with the average contribution of voluntary hours reported by Volunteering Australia (2016); but is considerably more hours per month than the average reported by ABS (2007) and the Productivity Commission (Australian Government 2011); and significantly more than the average for Bushcare volunteers reported by Rankin (2013). This highlights the value of community nurseries as a 'hub' for NRM volunteers;
- 8) A strong motivator for community nursery volunteers is an enjoyment of the social interaction they experience at the community nursery, highlighted by their comments on the value of volunteering in building community connectedness. This is significant since research is showing that volunteering 'enhances quality of life and life satisfaction and is associated with higher levels of self-esteem as well as lower reports of loneliness and isolation', that it contributes to 'feelings of empowerment' and that it 'appears to reduce the risk of dementia and promote brain health' (Cook & Sladowski 2013). Other research shows that volunteers are 'more delighted, pleased or mostly satisfied' with their lives, when compared to non-volunteers (Australian Government 2011). Some of the community nursery volunteers also point to the physical health benefits they gain from their volunteering.
- 9) For some 25% of the community nursery volunteers there would seem to be no identifiable barriers to them volunteering more time in the community nursery, and this cohort might be encouraged to volunteer increased hours if more skills training and more flexible opening hours were on offer. It highlights that the community nurseries have a reserve volunteer capacity that could be harnessed if there was an increase in the demand for local provenance plants;

- 10) Overall the respondents showed a very strong interest in skills training, and community nursery coordinators would be well advised to consider offering volunteer training in all the skills areas identified over a timeframe consistent with their budgetary constraints;
- 11) For the approximately 48% of community nursery volunteers who are contributing as much time as they currently have available coordinators would be advised to focus on the retention of these volunteers by ensuring they continue to feel valued and are encouraged to be proud of the contribution they are making;
- 12) Community nurseries also play an important role in community education on biodiversity issues and the importance of using local provenance native plants, and the evidence suggests that demand from the general community for local provenance plants is increasing;

Overall, community nurseries make a significant contribution to biodiversity conservation and support Bushcare and Landcare programs with local provenance plants; they help build community engagement, community spirit and connectedness, and strengthen social cohesion; they provide a welcoming and supportive volunteer space in which volunteers feel valued and appreciated and through which they contribute more volunteer hours and remain engaged longer than the average community volunteer.

Community nurseries provide a social hub, which benefits the whole community by helping older Australians remain actively engaged in their community, improving their self-esteem and sense of self-worth, increasing their sense of empowerment, promoting brain health and quality of life, while helping to reduce isolation and loneliness. Continued investment in the community nursery sector is a win-win for the environment, for local government, for society as a whole, as well as for the individual volunteers.

## 7 CONCLUSIONS

The challenge of effectively engaging community volunteers has been the focus of considerable research in recent years. Not only do volunteers play a vital role in virtually all aspects of community life, but volunteering brings health and wellbeing benefits to participants, such as reduced stress, better physical and mental health, longevity, social connectedness, a sense of purpose and life satisfaction (ABS 2011, Australian Government 2011, Cook & Sladowski 2013). Australian national and state biodiversity strategies and action plans also emphasise the importance of fully engaging the community in efforts to halt biodiversity decline. The vital role that community volunteers play in Landcare, Bushcare, Coastcare, Rivercare and Aboriginal NRM programs has been acknowledged by natural resource managers at the national, state, regional and local levels.

While there is significant scholarly literature on volunteer engagement through Landcare, Aboriginal NRM and local government-sponsored Bushcare programs (e.g. Gooch 2003, Youl Marriott & Nabben 2006, Curtis et al 2008, Gooch and Warburton 2009, Robins & Kanowski 2011, Buizer, Kurz & Ruthrof 2012, Tennent & Lockie 2012, Rankin 2013, Peters 2015, Huq & Burgin 2016), there is little published on the contribution that community volunteers make to growing local provenance plants for biodiversity conservation. Volunteer-based community nurseries, whether run by Landcare groups, Aboriginal communities or by local government, have become the key suppliers of local provenance genetically-appropriate plants for landscape rehabilitation and biodiversity enhancement.

The aim of this thesis is to examine the role of local government-run community nurseries in strengthening biodiversity conservation, and the integral role of community nursery volunteers, through a comparative case study of three local government-run community nurseries. The thesis has demonstrated that the community nursery sector plays a valuable role in the propagation and supply of local provenance plants and has demonstrated that the volunteers in these community nurseries represent an environmentally-aware, civic-minded, dedicated cohort in the community. They are generally active, older, retired or semi-retired, socially-engaged

people with a significantly higher proportion being female. A high proportion of these community nursery volunteers also volunteer with Bushcare or Landcare groups and/or with non-NRM community groups, which demonstrates their high levels of social engagement. Their motivations for volunteering in the community nursery are primarily to help conserve biodiversity and this was clearly the major driver in their motivation to work in the community nursery. However their motivations also include an enjoyment of growing plants, a desire to increase their knowledge of native plants and to improve their propagation skills. Many of the community nursery volunteers show a strong awareness of the important role community nurseries play in the supply of local provenance plants, and they rate their community nursery's role in delivering biodiversity conservation outcomes as high to very high.

All three council Environment Branch managers reported that increasing the availability of local provenance plants was a major factor in the decision to establish their community nursery. Providing a location for storage of local provenance seed was also significant for all the case study councils, although more so for the peri-urban council which invested significantly more resources into their seed bank. The provision of free plants for their Bushcare programs and supporting the implementation of their biodiversity strategies were major factors behind the urban and rural/ regional council's investment into their community nurseries. This was less the case for the peri-urban council which had a much stronger focus on the provision of plants for Landcare projects on farms.

The environment branch managers all reported a shift in their environment policies, strategies and focus in the previous five years, towards natural resource management, biodiversity conservation and sustainability issues. This change reflected a shift away from a compliance and enforcement focus, to State of the Environment reporting and then to actions directed at improving management of bushland and waterways. One of the key drivers behind this shift was a series of legislative changes to the environmental functions of local government in NSW, which expanded their environmental responsibilities (Kelly 2011). Another key driver was a policy shift by the NSW state government which gave local government the capacity to impose environment levies on ratepayers to fund environmental management initiatives. The

urban and rural/regional councils in the case study impose an environment levy that raises around a million dollars a year to fund their environment and sustainability programs. While the peri-urban council doesn't impose an environment levy it does impose a catchment remediation levy which funds stormwater quality improvement devices and riparian management. Thus these councils have, to some extent at least, overcome the resourcing and capacity issues highlighted by earlier researchers as creating significant impediments to effective natural resource management by local government (Pini & Haslam McKenzie 2006, Pini et al 2007, Bates & Meares 2010).

The increased funding for environmental management that these levies gave to councils led to an improved staff capacity to access grant funding from federal and state environmental programs, and to effectively manage NRM projects. There was also a flow-on into Bushcare and Rivercare programs as well as investment into the local government-run community nurseries which provide the plants for these programs. The environment branch managers all indicated ongoing council support for their community nurseries, with support from the elected councillors rated as moderate to high and a strong likelihood that these councils would invest further funds into a moderate expansion of the community nursery facilities.

The nursery coordinators all reported a very strong focus on biodiversity conservation / local provenance, with over 90% of production across the three nurseries being from local provenance sources and with demand increasing; they reported that the bulk of their production was directed towards environmental restoration / landscape rehabilitation projects. As production levels are sitting at over 80,000 plants a year across the three nurseries, it is clear they are playing an important role in local efforts to conserve and restore biodiversity. The case study nurseries also reported they had a strong reliance on advance orders to drive production and they were strongly impacted by fluctuations in demand, with variability in grant-based demand and demand predictability being significant. Demand lead times were reported as a major challenge impacting their supply capacity. All the community nursery coordinators reported a very strong reliance on community nursery volunteers, and all the nurseries had a cohort of regular volunteers. The high volunteer retention rates meant that volunteer recruitment was a fairly low priority and generally ad hoc or sporadic. Of all

the factors limiting increased production of local provenance plants volunteer numbers were among the least significant.

Although the most significant motivation reported by the community nursery volunteers was making a meaningful contribution to biodiversity conservation combined with enjoyment of growing native plants, most also reported a desire for additional training in native plant identification, seed collection, seed processing and plant propagation. While they showed a well-developed awareness of biodiversity issues and a strong connection with, and appreciation of, the native bushland around them, they were clearly interested in learning more. This sits well with the concept of lifelong learning, especially considering their average age was in the mid-60s.

Many respondents reported an enjoyment of the social aspects of the community nursery and commented on how the community nursery brings people together, gives them a sense of belonging and fosters community spirit. A high percentage of community nursery volunteers found the experience more satisfying, or much more satisfying, than other places where they volunteer; and the vast majority felt their volunteer contribution was quite valued or highly valued. A very high proportion indicated the way the community nursery engaged volunteers as good to very good. Parallel with this is the fact that Australia has an aging population and keeping older people engaged in the community is as good for their health and wellbeing, as it is for the maintenance of a vibrant civil society.

The thesis has identified a number of barriers to increased levels of volunteering in community nurseries, highlighted the key motivations of community nursery volunteers and outlined strategies that could be of value in volunteer recruitment and retention. The research also showed the role of the nursery coordinators is crucial to the effective engagement of community nursery volunteers, to developing a stimulating and supportive work environment and to the provision of responsive training. It is clear that the community nurseries in the case study have a reserve capacity that would enable them to propagate more local provenance plants, and that infrastructure improvements would enable significantly increased production.

The community nursery sector has a significant role to play in reversing the ongoing biodiversity decline, which has been critically highlighted in the literature (Coates and Atkins 2001, Walsh & Mitchell 2002, World Health Organisation 2005, Australian State of the Environment Report 2011, Flannery 2012). These community nurseries should be more widely acknowledged and supported in this important role, as should the highly-motivated volunteers who make up the bulk of their workforce. Like the Landcare 'movement' which has mobilised a significant proportion of primary producers in the shift toward sustainable natural resource management (Gooch 2003, Youl, Marriott & Nabben 2006, Curtis & Cooke 2006, DAFF 2008, Salt 2016), the community nursery sector is making a significant contribution and one that should be fostered. Along with the Bushcare initiative, community nurseries constitute an excellent example of the community and local government working together to achieve environmental and biodiversity outcomes, which is consistent with the principles exposed in the Rio Declaration on Environment and Development (UNCED 1992), the Convention on Biological Diversity (UN CBD 1993), the National Local Government Biodiversity Strategy (ALGA 1998), Australia's Biodiversity Conservation Strategy 2010–2030 (Natural Resource Management Ministerial Council 2010), and the NSW Biodiversity Strategy (DECCW 2010).

Community nurseries are likely to remain a vital element in efforts to reverse the decline in biodiversity well into the future, provided the contribution of the volunteers continues to be valued and acknowledged and efforts are made to keep those volunteers engaged. Such efforts should include ensuring the volunteers continue to feel valued and to feel that their contributions are both effective and worthwhile; that they are engaged meaningfully in decision-making processes, and they are given the opportunity to enhance their skills through relevant training and mentoring. Local government agencies and community nursery coordinators should also be mindful of value of community nurseries as a social hub which fosters and promotes community engagement, social cohesion, wellbeing and the principles of lifelong learning. All levels of government would be wise to encourage and foster this movement and ensure it is adequately supported and resourced. Ongoing support for the community nursery sector is a win-win for the environment, for local government, for society as a whole, as well as for the individual volunteers.



This study draws on the perspectives of both the volunteers and those who manage them in three local government-run community nurseries, and makes generalisations from this research on better engagement, retention and recruitment of volunteers across the community nursery sector. I chose this topic for research due to my involvement in facilitating the development of Landcare nurseries as a Landcare manager in South East Queensland, local government community nurseries as a Bushcare coordinator in NSW, and an Aboriginal community nursery in WA as a pro bono Aboriginal NRM facilitator. In this sense I was an 'insider' to the research. However, my role in facilitating the establishment / expansion of these nurseries was always a step removed, and did not encompass responsibility for the day-to-day operation of these nurseries, so in that sense I could carry out the research as an interested observer.

The community nurseries selected for this thesis research had different characteristics, in terms of size, capacity, funding arrangements, period of establishment, and geographic location across the urban, peri-urban and rural/regional spectrum, to capture the diversity of the community nursery sector. Although the three community nurseries were all selected from within the same Catchment Management Authority region, to reduce the potential influence of cross-regional variation in policy and funding arrangements, I believe the research can be generalised to the whole local government run community nursery sector, and may also have some validity for the Landcare-run nursery sector. Further research could be undertaken to investigate the focus, operational capacity and volunteer engagement in the Landcare nursery sector and in the Aboriginal community-run nursery sector.

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## 9 APPENDICES

### 9.1 Appendix 1: Community Nursery Volunteer Questionnaire

#### Community Nursery Volunteer Questionnaire

##### Questions about volunteer demographics

1. What age group do you belong to? (please circle)  
15-19 20-29 30-39 40-49 50-59 60-69 70-79 80+
2. What is your gender? (please circle) M F
3. What is your employment status? (please circle)
  - A. working F/T
  - B. working P/T
  - C. seeking work
  - D. semi-retired
  - E. retired
  - F. student
  - G. at-home carer
  - H. other

##### Questions about volunteering

4. How long have you been volunteering in the Community Nursery? (please circle)
  - A. New volunteer
  - B. 1-2 years
  - C. 3-4 years
  - D. 5-8 years
  - E. 9-12 years
  - F. 12-19 years
  - G. 20+ years
5. How many hours per month do you volunteer in the nursery? (please circle)
  - A. 1-4 hours
  - B. 5-8 hours
  - C. 9-12 hours



- D. 12-15 hours
- E. 16-19 hours
- F. 20-30 hours
- G. 30 + hours

6. Do you volunteer with other Natural Resource Management programs? (circle) Y / N

If yes, please specify: Bushcare; Landcare; 'Friends of' group; .....

7. Do you volunteer with other (non-NRM) community groups? Y / N

Type of group: .....

8. Are you participating in a Centrelink-approved volunteering program? Y / N

**Reasons for volunteering**

9. What attracts you to volunteering in the Community Nursery? (please circle)

*Note: low 1 = a minor influence & high 5 = a major influence*

- |                                       |                                |
|---------------------------------------|--------------------------------|
| A. Helping conserve biodiversity      | low 1----2----3----4----5 high |
| B. gaining Indigenous plant knowledge | low 1----2----3----4----5 high |
| C. gaining propagation skills         | low 1----2----3----4----5 high |
| D. enjoy growing plants               | low 1----2----3----4----5 high |
| E. enjoy the social aspect            | low 1----2----3----4----5 high |
| F. other                              | low 1----2----3----4----5 high |

Additional comments:

.....  
 .....  
 .....

10. How does the volunteer experience in the Community Nursery compare to other areas where you volunteer, if any? (please circle)

Much less satisfying 1----2----3----4----5 much more satisfying N/A

Additional comments:

.....  
.....  
.....

11. How important is volunteering to fostering community spirit? (please circle)

Not important at all 1----2----3----4----5 Extremely important

Additional comments:

.....  
.....

12. What do you personally gain from volunteering? (please circle)

*Note: low 1 = a minor factor & high 5 = a major factor*

Enjoy the social interaction            low 1----2----3----4----5 high

The opportunity to learn new skills low 1----2----3----4----5 high

Gaining Indigenous plant knowledge    low 1----2----3----4----5 high

The opportunity to teach others            low 1----2----3----4----5 high

Helping the environment            low 1----2----3----4----5 high

Other                                    low 1----2----3----4----5 high

Additional comments:

.....  
.....  
.....

13. Do much do you think your volunteer contribution in the nursery is valued? (please circle)

Not valued at all 1----2----3----4----5 highly valued

Additional comments:

.....  
.....  
.....

**Barriers / limitations to your volunteering**

14. How significant are the following factors in limiting your capacity to volunteer in the nursery? (please circle)

- A. Transport                      not significant 1----2----3----4----5 very significant
- B. Finances                      not significant 1----2----3----4----5 very significant
- C. Time                              not significant 1----2----3----4----5 very significant
- D. Disability access              not significant 1----2----3----4----5 very significant
- E. Other                              not significant 1----2----3----4----5 very significant
- F. Not applicable

Additional comments:

.....  
.....  
.....

15. How would you describe the quality of your volunteer experience in the Community Nursery? (please circle)

Very poor 1----2----3----4----5 very good

Additional comments:

.....  
.....  
.....

16. How would you rate the way the Community Nursery engages volunteers? (please circle)

Very poor 1----2----3----4----5 very good

Additional comments:

.....  
.....  
.....

17. What would encourage you to volunteer more hours? Rate the factors listed below:  
(please circle)

- A. More skills training            not significant 1----2----3----4----5 very significant
- B. More flexible opening hours    not significant 1----2----3----4----5 very significant
- C. Improved volunteer facilities    not significant 1----2----3----4----5 very significant
- D. Better propagation facilities    not significant 1----2----3----4----5 very significant
- E. Better access to transport not significant 1----2----3----4----5 very significant
- F. Other ..... not significant 1----2----3----4----5 very signif
- G. Not applicable

Additional comments:

.....  
.....  
.....

**Questions about biodiversity**

18. How do you rate your level of concern about the biodiversity loss in Australia? (please circle)

very low 1----2----3----4----5 very high

Additional comments:

.....  
.....  
.....

19. How would you rate the general community awareness about the loss of biodiversity in Australia? (please circle)

very low 1----2----3----4----5 very high

Additional comments:

.....  
.....  
.....

20. How do you rate the biodiversity values within your Local Government area? (please circle)

very low 1----2----3----4----5 very high

Additional comments:

.....  
.....  
.....

21. How do you rate your Local Council record of delivering biodiversity conservation outcomes? (please circle)

very low 1----2----3----4----5 very high

Additional comments:

.....  
.....  
.....

22. How would you rate the importance of your Community Nursery to delivering biodiversity conservation outcomes? (please circle)

very low 1----2----3----4----5 very high

Additional comments:

.....  
.....  
.....

23. How would you rate the importance of Local Provenance plant supply for revegetation works? (please circle)

Not important at all 1----2----3----4----5 very important

Additional comments:

.....  
.....  
.....

**Questions about skills training within the Community Nursery**

24. Rate the areas of skills training that would be of greatest interest to you? (please circle)

- A. propagation skills                      no interest at all 1-----2-----3-----4-----5 very interested
- B. seed collection skills    no interest at all 1-----2-----3-----4-----5 very interested
- C. seed processing & storage    no interest at all 1-----2-----3-----4-----5 very interested
- D. Native tree & shrub ID    no interest at all 1-----2-----3-----4-----5 very interested
- E. Native forbs & grasses ID    no interest at all 1-----2-----3-----4-----5 very interested
- F. Other                                      no interest at all 1-----2-----3-----4-----5 very interested

Additional comments:

.....

.....

.....

25. Which Community Nursery do you volunteer with?

.....

## 9.2 Appendix 2: Cover letter to Nursery Volunteer Questionnaire

### Community Nursery Volunteers Survey 2014

Dear Community Nursery Volunteer,

This letter is to request your participation in the attached/enclosed survey, which should take about **15 minutes** to complete.

This survey is seeking information about community nursery volunteers – who they are, the extent of their volunteer contribution, their motivations for volunteering and their level of satisfaction with their volunteer experience in the community nursery. The survey has been sent out by the nursery manager who appreciates that it could assist them improve their volunteer engagement.

This survey also seeks to identify the barriers to increased levels of volunteering and to find out what nursery volunteers identify as their key training needs. We are also seeking to understand how community nursery volunteers perceive biodiversity values and their role in preserving biodiversity.

The survey is a component of a Masters of Environmental Science research project that is examining the contribution community nurseries are making to biodiversity conservation in urban, peri-urban and rural areas. This research is also investigating the strategies and barriers to community engagement and capacity building.

Your **participation in this survey is voluntary** yet will be greatly appreciated. The results will help community nurseries engage better with their volunteers and better understand their needs and motivations.

**This survey is anonymous.** We do ask you to identify the community nursery you volunteer with but none of the information you provide will be identifiable. The responses we receive will be tabulated to provide a general picture of the volunteers who work in community nurseries, their motivations and needs. The more responses we receive the more accurate the results will be.

Please return the completed survey form in the **Reply Paid envelope**.

You will also find a separate form and Reply Paid envelope for those willing to participate in a more in-depth phone or face-to-face interview. If you are happy to participate in this, please complete and return this form separately.

Yours sincerely

Paul Marshall  
Master of Environmental Science candidate

## **9.3 Appendix 3: Telephone interview questions**

### **Community Nursery Volunteer – telephone interview**

#### Opening statement to telephone interview participant

When you completed the Community Nursery Volunteer Questionnaire you completed a slip indicating that you were happy to participate in a telephone interview to provide more detailed information about your volunteering effort in the community nursery.

The questions form part of a Masters of Environmental Science research project on community nurseries. We are seeking a better understanding of the contribution made by community nursery volunteers, including their motivation and the barriers that impact on that contribution.

This telephone interview will take up to 30 minutes to complete. To ensure you are comfortable with the questions and the interviewer, you will be asked at approximately five minute intervals if you wish to continue. This is standard practice. You are free to stop the interview at any time and are not required to respond to all the questions if you do not wish to. Your responses will be treated as confidential and presented in the analysis in a way that ensures they are not identifiable.

If at any time you wish to change an earlier comment please don't hesitate to say so. If you decide to withdraw from the interview at any time you are free to do so. Your time and willingness to undertake this interview is appreciated.

#### **Reasons for volunteering**

In the questionnaire we asked what attracts you to volunteering in the Community Nursery. We are seeking a better understanding of what motivates community nursery volunteers such as you to volunteer. Please comment.

In the questionnaire we asked about your volunteer experience in the Community Nursery compared to other areas where you volunteer, if any? Can you comment on how satisfying your volunteer experience in the nursery is compared to other areas where you volunteer your time?



In the questionnaire we asked how important you think volunteering is to fostering community spirit. Please comment on this either in general terms or in relation to the community nursery.

In the questionnaire we asked what you feel you personally gain from volunteering in the Community Nursery and asked you to rate the factors that encouraged you to volunteer in the nursery, such as: the social interaction, the opportunity to learn new skills, gaining Indigenous plant knowledge, the opportunity to teach others, and helping the environment. How important are these to you personally and are there other factors that also encourage your volunteer effort in the nursery?

In the questionnaire we asked how much you think your volunteer contribution in the nursery is valued. We would like to understand how important it is to volunteers that their volunteer contributions are recognised and valued. Please comment.

### **Barriers / limitations to your volunteering**

In the questionnaire we asked about the factors that limit your capacity to volunteer in the community nursery, and the significance of factors such as transport, finances, time, and disability access. Can you comment further on these or other things that limit your capacity to volunteer in the nursery?

In the questionnaire we asked how you would rate the way the Community Nursery engages volunteers. We would like to understand how community nurseries can more effectively engage volunteers in their operations. Please comment.

In the questionnaire we asked what would encourage you to volunteer more hours in the community nursery, and asked you to rate the importance of: more skills training, more flexible opening hours, improved volunteer facilities, better propagation facilities, and better access to transport. Can you comment on these or other factors?

## 9.4 Appendix 4: Summary of volunteer telephone responses

Question	Vol 4	Vol 10	Vol 27	Vol 29	Vol 39	Vol 46	Vol 56
<i>Q1: What motivates community nursery volunteers such as you?</i>	I wanted to learn more about local provenance plant; I'm interested in revegetation; [but] it's all a bit disorganised.	I'm interested in native plants and the environment; It's local, it's flexible; I like working with people- it's very enjoyable.	Interested in plants all my life; to socialise with like-minded people with an environmental bent; giving something back to the community; learning new skills.	Learning more about native plants; contribute to the community; I enjoy the company; and the staff make it worthwhile staying.	Growing local provenance plants is a very good thing; the community nursery is a nice social space; I find it very rewarding.	I have the time and am concerned about the environment; it's a great way to meet like-minded people; to pick up new skills; 'make a difference'; have a positive impact in the community.	I like gardening and I have a big garden; I needed to get out and do something; I wanted to meet people and learn.
<i>Q2: How satisfying is your community nursery volunteer experience compared to other areas where you volunteer?</i>	CWA is more collaborative and supportive than the community nursery is.	I find working at the community Nursery very relaxing. Since I retired I have only volunteered at the community nursery.	[Working at] the Community nursery is very satisfying; excellent really! I'm not doing any other volunteering [at the moment].	I volunteer with a lot of things - it is hard to compare as they are very different.	The satisfaction comes from a strong sense of achievement; and working with a nice group of people; plus the opportunity to exchange views.	The biggest downside at this community nursery is there is not much training for the volunteers.	I have never volunteered for anything before. [This] is my first experience at volunteering and I am enjoying it immensely.

Question	Vol 4	Vol 10	Vol 27	Vol 29	Vol 39	Vol 46	Vol 56
<i>Q3: How important is volunteering to fostering community spirit?</i>	Volunteering is very important to fostering community spirit, but a lot depends on who is running the group. Some people are better at engaging volunteers than others.	Volunteering is essential, very important, for fostering community spirit. People meet people and forge links with people who have a different view of life and different backgrounds.	Volunteering is extremely important to fostering a community spirit - it brings little communities together. It helps create a 'tribal' structure and a sense of belonging.	It's very worthwhile for people to get out of focussing on their own needs and to volunteer for the community.	It creates an incredible sense that they are making a difference. And people like working together because it's very satisfying to do something for the community.	It is very educative - providing advice to people on plant selection; The people who volunteer here have lots of experience and knowledge and can advise the public.	It's a very, very important thing to do, getting people engaged. I wish more people would know about it since it is so needed, so people aren't sitting at home alone and feeling isolated.
<i>Q4: What do you personally gain from volunteering in the community nursery? How important is the social interaction, opportunity to learn new skills /</i>	I didn't really gain all that much. I didn't continue because I couldn't find a voice. I got frustrated because the biggest voice was dominating, and	I enjoy the social aspects, meeting a new group of people. It offers people the chance to interact, to learn new skills.	All the things listed are very important. I have learnt a lot in the community nursery and have been able to pass on information to others.	For me, learning about native plants is very important. Helping the environment is a strong motivation for me. I want to see more indigenous plants around.	I think all those things are all very important. Also, as I'm getting older and no longer working full time, it's important for me stay active and be productive.	All the factors listed cover the reasons I volunteer at the nursery. I get a lot of satisfaction from knowing I am contributing to looking after the environment.	All the things listed are at the highest scale of importance; I've met a fantastic group of people and I made some terrific friendships. I am learning lots about native

Question	Vol 4	Vol 10	Vol 27	Vol 29	Vol 39	Vol 46	Vol 56
<i>gain Indigenous plant knowledge, the opportunity to teach others, and helping the environment?</i>	others didn't get a chance.						plants and the local environment.
<i>Q5: How important is it to volunteers that their volunteer contributions are recognised and valued?</i>	There should have been little groups and a buddy system. It should be collaborative. There was no real satisfaction and no real consultation on how to do things differently	Our volunteer contribution is very valued. The woman in charge of the volunteers is very positive, encouraging, and very open and supportive	My volunteer contribution was always very highly valued. I always felt appreciated and never taken for granted. Some organisations treat the volunteers like children.	They put in a big effort; give out volunteer awards, provide training courses for free, and generally look after us. I always feel appreciated; We get constant feedback ...which is very fulfilling.	I think my volunteer contribution is highly valued, at least by the other community nursery volunteers and also by Council's Bushcare team.	I think it's important for us to feel valued, if we are giving up our time to volunteer here.	I think the volunteers at our nursery are valued very highly. Everyone wants to be valued and I think that we are valued in the community nursery.
<i>Q6: Comment on factors that might limit your involvement in the nursery – such as</i>	Availability of time was the only real issue, as I only had the weekends. But I'm retired now	None of these things are a limit to us; we go away on holidays, and we have other things	Lack of time is the big issue for me.... I don't have much spare time.	None of those limitations affect me, only my external life commitments. Other things I	The thing that limits me is my health; time can be an issue for me. Sometimes it will clash with	None of the barriers or limitations listed are a factor for me. Only time is, I guess, since we	Transport is my biggest problem; I live a fair distance away and can only get there by car. I

Question	Vol 4	Vol 10	Vol 27	Vol 29	Vol 39	Vol 46	Vol 56
<i>transport, finances, time, and disability access?</i>	and I have lots of time	to accomplish.		have on take precedence.	other things, such as with family needs	do a bit of travelling away.	don't drive so my husband drives me in one day a week.
<i>Q7: How can community nurseries more effectively engage volunteers in their operations?</i>	The coordinator needs people skills to welcome people and engage them better. Giving people tasks that they want to do and are capable of doing. Show they value the effort of the volunteers	They don't go out of their way to encourage people to join; There is not a lot of structure to the volunteering arrangements, which appeals to me but perhaps not to others.	They have no problem with retention of their volunteers; they are very successful with that. Nursery space is the main limitation, which is a pity.	Council could advertise it more, or else their form of promotion is not very effective. I believe [...] community nursery is full and don't need any more volunteers at the moment	I don't think much recruitment effort is happening. I'm not quite sure it would make much difference ... people involved with Bushcare would probably already know about it.	We should have been mentored for a while when we started; Everyone does things differently and providing us with mentoring at the start would have avoided confusion.	They don't promote or advertise the nursery much, only by word of mouth and the sign on the road. But nonetheless they do have a big group of volunteers.
<i>Q8: What would encourage you to volunteer more hours in the community</i>	All of the things listed are important. I know some volunteers are	None of these things, only time; one day per week is enough	No nothing really, I'm just limited by time availability. No other	No, for me, I just can't afford to give more time.	Just having more time is the main factor for me. If there was a working bee on	For me just better training would have made me	I would volunteer more hours if I had better transport. I think they could

Question	Vol 4	Vol 10	Vol 27	Vol 29	Vol 39	Vol 46	Vol 56
<i>nursery?</i>	held back by transport issues. I think that car-pooling could help.	for me.	impediments.		another day of the week I would volunteer more often, and so would quite a few of the other volunteers	happier.	also teach more skills.

## 9.5 Appendix 5: Detailed volunteer telephone interview responses

**Question 1:** In the questionnaire we asked what attracts you to volunteering in the Community Nursery. We are seeking a better understanding of what motivates community nursery volunteers such as you to volunteer. Please comment.

*'Initially I wanted to learn more about local plants, local provenance plants. I was new to the area and I wanted to plant Local Provenance plants at home. Generally, I'm interested in revegetation. I've been active there right from when the Community Nursery began. There hasn't been much planning, not strategic planning, it's all a bit disorganised. Council is a strange beast. The Council is not very interested in the Community Nursery; its officers have their own agendas.'* (Vol 4)

*'I started volunteering after I retired. I've always been interested in native plants and in the environment and I'm a 'greenie'. I knew about the Community Nursery as I had bought plants there. It's local, its flexible - there is no onus for set times or commitments, you just turn up. I like working with people - it's enjoyable, very enjoyable.'* (Vol 10)

*'There are many reasons that attract me to volunteering at the nursery. I gardened as a child and have been interested in plants all my life. I had to stop work due to suffering depression, so I started at the Community Nursery to socialise with like-minded people with an environmental bent. Helping the environment is my main interest, and giving something back to the community. I also like to learn lots of new skills.'* (Vol 27)

*'The things that attract me are: one, learning more about native plants for my own garden and use; two, I like to contribute to the community on volunteer basis; three, I enjoy the company; and four, I have a strong connection with the Community Nursery staff especially the manager. The staff make it worthwhile staying.'* (Vol 29)

*'There are several answers to that: I think that growing local provenance plants from local seed is a very good thing; the Community Nursery is a nice social space and a good place for social involvement; I find it very rewarding. I like the whole concept.'* (Vol 39)

*'Firstly, I have the time as I recently retired. Secondly I'm an environment 'nut' - my daughter has a degree in Environmental Science and we are both very concerned about the environment. Thirdly, it's a great way to meet people - I've just moved down from [...] and I wanted to meet like-minded people. It's also a great way to pick up new skills - I believe in life-long learning. It also gives me access to some lovely plants - I didn't know that when I started but I appreciate it. I also like to 'make a difference' and have a positive impact in the community I live in.'* (Vol 46)

*'First and foremost I like gardening and I have a big garden. I felt I needed to help on a broader scale, to get out and do something, to meet people and learn - which is something I have done here. My husband volunteers with the Rural Fire Brigade but I didn't want to do that, I wanted to do something different.'* (Vol 56)

**Question 2:** In the questionnaire we asked about your volunteer experience in the Community Nursery compared to other areas where you volunteer, if any? Can you comment on how satisfying your volunteer experience in the nursery is compared to other areas where you volunteer your time?

*'I volunteered with [...] CWA, which was very satisfying because (a) all the volunteers were women, and (b) we were all working for same objectives. Some people want to be "know it alls" and are domineering. They think they are "a big fish in a little pond". I think people are 'stuck in a mould' and don't seem to have a wider perspective. CWA is more collaborative and supportive than the Community Nursery is.'* (Vol 4)

*'I belong to the VIEW Club, but there is not much volunteering there at moment. Since I retired I have only volunteered at the Community Nursery. Years ago used to volunteer at the Australian Plant Society. I find working at the Community Nursery very relaxing. I used to be a teacher and there is no need to deal with lots of people at Community Nursery, which suited me well.'* (Vol 10)

*'I'm not doing any other volunteering. I was very active with the Community Nursery for 8 to 10 years but now I only volunteer occasionally. I worked with 'Get Up' during*



*the elections, just occasionally, but I found it very satisfying. The Community Nursery has been the primary thing. It's very satisfying; excellent really!' (Vol 27)*

*'I volunteer with a lot of things - I have kids and I volunteer with the school, etc. It is hard to compare. When I volunteer for things associated with my kids it is very satisfying, but it is hard to compare as they are very different.'* (Vol 29)

*'The satisfaction comes from a strong sense of achievement, from getting things done. You see what you have achieved at the end of each working bee and see what was done the previous month –there are very quick rewards in that respect. I like the ambience of working there, with a nice group of people; I enjoy the morning teas we have, which provide the opportunity to exchange views.'* (Vol 39)

*'The biggest downside at this Community Nursery is there is not much training for the volunteers whereas in the local Fire Brigade the volunteers get lots of training opportunities. We've only had First Aid training here. My volunteer experience in the Community Nursery has been quite different to other areas in which I've volunteered such as the Scouts, Brownies and Duke of Edinburgh Scheme. There seems to be a bit of tension between those who established the Community Nursery and Council pulling in different directions.'* (Vol 46)

*'I have never volunteered for anything before. Volunteering at the Community Nursery is my first experience at volunteering and I am enjoying it immensely.'* (Vol 56)

**Question 3:** In the questionnaire we asked how important you think volunteering is to fostering community spirit. Please comment on this either in general terms or in relation to the community nursery.

*'I think volunteering is very important to fostering community spirit, but a lot depends on who is running the group. Some people are better at engaging volunteers than others. You need to bring people together and not focus on an individual idea.'* (Vol 4)

*'Volunteering is essential, very important, for fostering community spirit. People meet people and forge links with people who have a different view of life and different backgrounds. It creates a diverse range of linkages between people.'* (Vol 10)

*'Volunteering is extremely important to fostering a community spirit. Volunteering is one of the most important ways of doing that in neighbourhoods and villages. It's a good way of making friends. I think it brings little communities together. It helps create a 'tribal' structure and a sense of belonging, whether with the Bush Fire Brigade or with other groups.'* (Vol 27)

*'It's very worthwhile for people to get out of focussing on their own needs and to volunteer for the community. It takes you out of yourself and away from self-centred view of things.'* (Vol 29)

*'For the people who choose to volunteer it creates an incredible sense that they are making a difference. And people like working together because it's very satisfying to do something for the community. There is very little that one person can achieve by themselves, but a lot can be achieved by working things together as a community.'* (Vol 39)

*'The Community Nursery provides great PR value for Council. Plus it is very educative, providing advice to people on plant selection. The people who volunteer here have lots of experience and knowledge and can advise the public.'* (Vol 46)

*'I think it's extremely important. If more people understood about volunteering more would get involved. It's a real shame that it isn't fostered more. You get to meet great people and it makes you feel part of the community. It's a very very important thing to do, getting people engaged. I wish more people would know about it since it is so needed, so people aren't sitting at home alone and feeling isolated. There are lots of agencies that need help and if people volunteered more it would be a big help to them. I think the elderly volunteers in the nursery are such an inspiration!'* (Vol 56)

**Question 4:** In the questionnaire we asked what you feel you personally gain from volunteering in the Community Nursery and asked you to rate the factors that

encouraged you to volunteer in the nursery, such as: the social interaction, the opportunity to learn new skills, gaining Indigenous plant knowledge, the opportunity to teach others, and helping the environment. How important are these to you personally and are there other factors that also encourage your volunteer effort in the nursery?

*'I didn't really gain all that much. I didn't continue volunteering at the Community Nursery due to not being given a say in how we did things. I withdrew because I couldn't find a voice. I got frustrated because the biggest voice was dominating, and others didn't get a chance. The leader was not giving others a chance to have an influence on the direction of the nursery.'* (Vol 4)

*'I enjoy the social aspects, meeting a new group of people. The Community Nursery provides a good service to the public. It's not a commercial enterprise, but it encourages the public to grow native plants, which is very important. It offers people the chance to interact, to learn new skills. There could be more done at Local Government level to encourage the public to grow native plants. The Community Nursery could be bigger and grow more plants, but it comes back to funding and the level of Local Government support.'* (Vol 10)

*'All the things listed are very important. I have learnt a lot in the Community Nursery and have been able to pass on information to others.'* (Vol 27)

*"For me, teaching others is less important, but learning about native plants is very important. Helping the environment is also very important; it's a strong motivation for me. I want to see more indigenous plants around.'* (Vol 29)

*"I think all those things are all very important. For me the social interaction aspect is not quite as important, because I can get that elsewhere. All the other things are very important in a Community Nursery situation. Also, as I'm getting older and no longer working full time, it's important for me to have something I can go and do with my time too.'* (Vol 39)

*'All the factors listed cover the reasons I volunteer at the nursery. I have a passion to contribute to the environment. I think there is a symbiotic relationship that comes*

*from volunteering in the nursery - I get a lot of satisfaction from knowing I am contributing to looking after the environment.'* (Vol 46)

*'All the things listed are at the highest scale of importance. I am new to volunteering, just about 6 months. I've met a fantastic group of people and I have made some terrific friendships. I am learning lots about native plants and about the local environment. I am in a Garden Club and I talk to them all the time about native plants and what we've doing at the community nursery. We have a great community here and anything to foster that is great.'* (Vol 56)

**Question 5:** In the questionnaire we asked how much you think your volunteer contribution in the nursery is valued. We would like to understand how important it is to volunteers that their volunteer contributions are recognised and valued. Please comment.

*'I would rate it as minus 1 on a scale of 1 to 10, because there was no requirement for feedback or that they sought input, and there was no real consultation on how to do things differently. There should have been little groups and a buddy system. It should be collaborative. There was no real satisfaction and always blocks put in the way.'* (Vol 4)

*'I think our volunteer contribution is very valued. The woman in charge of the volunteers is very positive, encouraging, and very open and supportive.'* (Vol 10)

*'I think my volunteer contribution was always very highly valued. I always felt appreciated and never taken for granted. I would go to the plant giveaway day and help people with plant selections. It's vital. With some other organisations (e.g. [...]) the volunteers are treated like children and that wasn't a good experience for me. I didn't feel valued and withdrew.'* (Vol 27)

*'I think [...] Council does a particularly good job of valuing volunteers. They put in a big effort. They cost out our time and let us know the value it equals. They give out volunteer awards, provide training courses for free, and generally look after us. I always feel appreciated. We get constant feedback from manager which is very fulfilling.'* (Vol 29)

*'I think my volunteer contribution is highly valued, at least by the other Community Nursery volunteers and also by Council's Bushcare team. However, I don't think Council as a whole, or the Councillors, value it much. For instance if you asked someone in the Finance branch they wouldn't really know about the nursery or appreciate our volunteer efforts. Especially as compared to the efforts of someone who volunteered for a sports club e.g. the soccer club.'* (Vol 39)

*'I think it's important for us to feel valued, if we are giving up our time to volunteer here. I just got a certificate to acknowledge the contribution of volunteers over the 25 years that the Community Nursery has been operating, which was wonderful. It was also great to have the First Aid certificate paid for - this is very important to me at my stage of life. Giving the volunteers access to plants is also a great system - volunteer can get 5 free plants per month and that is a very positive thing.'* (Vol 46)

*'I think the volunteers at our nursery are valued very highly. I am only new but everything that everyone does is a good contribution and is valuable. The volunteers are very important. Everyone wants to be valued and I think that we are valued in the Community Nursery.'* (Vol 56)

**Question 6:** In the questionnaire we asked about the factors that limit your capacity to volunteer in the community nursery, and the significance of factors such as transport, finances, time, and disability access. Can you comment further on these or other things that limit your capacity to volunteer in the nursery?

*'Availability of time was the only real issue, as I only had the weekends. But I'm retired now and I have lots of time.'* (Vol 4)

*'None of these things are a limit to us. We live locally. We do volunteer on regular basis, but we also go away on holidays, and we have other things to accomplish. The Community Nursery is so good for us. At other places, like Meals on Wheels, we might be regarded as unreliable volunteers. But this isn't an issue at the Community Nursery.'* (Vol 10)

*'Lack of time is the big issue for me.... I don't have much spare time.'* (Vol 27)

*'None of those limitations affect me, only my external life commitments. Other things I have on take precedence. If the Community Nursery was open more often, I could contribute half a day each week, but not any more than that. I have limited time.'* (Vol 29)

*'The thing that limits me at the Community Nursery would be my health, that is, when I'm not well. It's not hard work but my back does get sore from standing around potting up plants. Also it gets very cold in the nursery in winter and can get hot in summer. Then the wet weather is sometimes an issue. Time can be an issue for me. Sometimes the working bees will clash with other things, such as with family needs. So for me time can be a barrier.'* (Vol 39)

*'None of the barriers or limitations listed are a factor for me. Only time is, I guess, since we do a bit of travelling away.'* (Vol 46)

*'My biggest problem is transport. I live a fair distance away and can only get there by car. I don't drive so my husband drives me to the nursery one day a week. But I would find a way to get there anyway, because I really love volunteering there, and I'm sure someone would help me if my husband couldn't''.* (Vol 56)

**Question 7:** In the questionnaire we asked how you would rate the way the Community Nursery engages volunteers. We would like to understand how community nurseries can more effectively engage volunteers in their operations. Please comment.

*'I would rate it minus 1 on a scale of 1 to 10. The group seemed to dwindle down to a hard core; people came but didn't stay. The coordinator needs people skills and needs to welcome people and engage them better. Giving people tasks that they want to do and are capable of doing. Show that they value the effort of the volunteers. The attitude of the councillors is pathetic and Council officers don't have much of an idea about dealing with volunteers.'* (Vol 4)

*'There is no advertising via Local Government. I don't think it's mentioned on their website. They don't go out of their way to encourage people to join; it's all very low key. There is not a lot of structure to the volunteering arrangements, which appeals*

*to me but perhaps not to others. They could do more to let people know the Community Nursery was here and what it offers.’ (Vol 10)*

*‘The Community Nursery has 10 people on waiting list to become volunteers. They have no problem with retention of their volunteers; they are very successful with that. Nursery space is the main limitation, which is a pity. They have lots of useful knowledge and skills that are not being used effectively.’ (Vol 27)*

*‘I found out about the Community Nursery from a friend who advised me to go along. Maybe [...] Council could advertise it more, or else their form of promotion is not very effective. I believe [...] Community Nursery is full and don't need any more volunteers at the moment.’ (Vol 29)*

*‘I don't think much recruitment effort is happening. I'm not quite sure it would make much difference. If it were promoted more, and more people knew it was there, I doubt all that many would be likely to join up... people involved with Bushcare would probably already know about it.’ (Vol 39)*

*‘My only disappointment is the lack of training. We should have been mentored for a while when we started, to show us the way the Community Nursery likes things done. Everyone does things differently and providing us with mentoring at the start would have avoided confusion.’ (Vol 46)*

*‘I just knew the community nursery was there because of the sign on the road, so I followed it up. They don't promote or advertise the nursery much, only by word of mouth and the sign on the road. If I hadn't seen the sign I wouldn't have got involved. They don't put themselves out there. But nonetheless they do have a big group of volunteers.’ (Vol 56)*

**Question 8:** In the questionnaire we asked what would encourage you to volunteer more hours in the community nursery, and asked you to rate the importance of: more skills training, more flexible opening hours, improved volunteer facilities, better propagation facilities, and better access to transport. Can you comment on these or other factors?

*'All of the things listed are important. I know some volunteers are held back by transport issues. I think that car-pooling could help. It is hard to get there without a car.'* (Vol 4)

*'None of these things, only time. At this time of my life, When I retired, there was a certain degree of 'I'm in charge of my time now.'* (Vol 10)

*'No nothing really, I'm just limited by time availability. No other impediments. I still aspire to get there more often. The Community Nursery plays an important part in community education; the public learn about the environment during the plant giveaway days.'* (Vol 27)

*'No, for me, I just can't afford to give more time.'* (Vol 29)

*'Just having more time is the main factor for me. I can't always make it on the [...]. If there were more frequent working bees I could volunteer more often, especially if there was a working bee on another day of the week. Then I would volunteer more often, and so would quite a few of the other nursery volunteers.'* (Vol 39)

*'For me just better training would have made me happier. I would give more time if it was for a particular project, if I knew where the plants were going to be planted and the time constraints that meant we needed to put in more effort in order to get them propagated.'* (Vol 46)

*'I would volunteer more hours if I had better transport. I think they could also teach more skills. Unfortunately the management don't do this; they seem to leave it to the experienced volunteers to pass on the skills. If they provided more skills training I would get involved more, especially in the growing season when there is more activity.'* (Vol 56)



## 9.6 Appendix 6: Community Nursery Manager/Coordinator Questionnaire

### Community Nursery Manager/Coordinator Survey Questions

#### Questions about production capacity and sales

1. How many years has your Community Nursery been operating? (please circle)

1-3   4-6   6-9   10-15   15+

2. How has your nursery's production capacity changed in the last 3-5 years? (please circle)

much less   1-----2-----3-----4-----5   much more

Additional comments:

.....  
.....  
.....

3. What is your current annual production? (please circle)

5-10,000   10-20,000   20-30,000   30-40,000   40,000+

4. What percentage of your annual production is grown to order? (please circle)

0-19%   20-39%   40-59%   60-79%   80-100%

Additional comments:

.....  
.....  
.....

5. What percentage of your annual production is given away free of charge? (please circle)

0-4%   5-10%   11-20%   20-50%   50+%

Additional comments:

.....  
.....  
.....

6. What percentage of your annual production is discarded /dumped? (please circle)

0%   1-4%   5-10%   11-15%   16+%

Additional comments:

.....

.....  
**Questions about your staffing levels**

7. How many dedicated staff (in Full Time Equivalents) work in your Community Nursery?  
(please circle)

FTE >0.5 0.5-1.0 1.0-1.5 1.5-2.0 2.0+ FTE

Additional comments:

.....  
.....  
.....

8. How many dedicated staff (in Full Time Equivalents) work on seed collection activities for  
your Community Nursery? (please circle)

FTE <0.5 0.5-1.0 1.0-1.5 1.5-2.0 2.0+ FTE

Additional comments:

.....  
.....  
.....

9. How important is income from plant sales for funding the operating costs, including staff  
wages, of your Community Nursery? (please circle)

low 1----2----3----4----5 high

Additional comments:

.....  
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10. How many days per week does your Community Nursery operate on average? [    ]

Additional comments:

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**Questions about your engagement of volunteers**

11. How important is the contribution volunteers make to your Community Nursery? (please circle)

Minor contribution 1----2----3----4----5 major contribution

Additional comments:

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12. How many volunteers regularly work in your Community Nursery? (please circle)

1-5 6-10 11-15 16-20 21+

Additional comments:

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13. On average how many hours do volunteers contribute per month? (please circle)

1-24 25-49 50-99 100-199 200+

Additional comments:

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.....

14. How much focus do you put onto volunteer recruitment? (please circle)

minor focus 1----2----3----4----5 strong focus

Additional comments:

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15. How many people registered with the *Over-55 Centrelink-approved Volunteer Program* volunteer in your Community Nursery? (please circle)

0 1-3 4-6 7-9 10+

Additional comments:

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**Questions about your focus on biodiversity**

16. How strongly is your Community Nursery focussed on biodiversity outcomes? (please circle)

minor focus 1----2----3----4----5 strong focus

Additional comments:

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17. What percentage of your plant production goes to revegetation / landscape restoration?

(please circle) 0-24% 25-49% 50-74% 75-100% don't know

Additional comments:

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18. How would you rate the level of demand for local provenance plants? (please circle)

Very low 1----2----3----4----5 very high

Additional comments:

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19. How has the demand for local provenance plants changed over the last 3 years? (please circle)

much less 1----2----3----4----5 much more

Additional comments:

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.....



easy 1----2----3----4----5 difficult

Additional comments:

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24. How has your stock of local provenance seed changed over the previous 3 years? (please circle)

much less 1----2----3----4----5 much more

Additional comments:

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**Questions about the impediments to expanding your production of local provenance plants**

25. In your strategic planning for the nursery how significant is expansion of your production capacity?

(please circle) low 1----2----3----4----5 high

Additional comments:

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26. How significant are the following factors in restricting your production of local provenance plants?

(please circle)

- A. Customer demand low 1----2----3----4----5 high
- B. Variability in demand low 1----2----3----4----5 high
- C. Demand predictability low 1----2----3----4----5 high
- D. Demand lead time low 1----2----3----4----5 high
- E. Seed supply low 1----2----3----4----5 high

- F. Seed storage                    low 1----2----3----4----5 high
- G. Germination rates                    low 1----2----3----4----5 high
- H. Nursery space                    low 1----2----3----4----5 high
- I. Water supply                    low 1----2----3----4----5 high
- J. Volunteer numbers                    low 1----2----3----4----5 high
- K. Staffing levels                    low 1----2----3----4----5 high
- L. Other factors                    low 1----2----3----4----5 high

Additional comments:

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## 9.7 Appendix 7: Cover letter to community nursery managers



### Department of Geography and Sustainable Communities

April 2014

#### Community Nursery Manager's Survey 2014

Dear Community Nursery manager / coordinator,

We are seeking your participation in:

1. a semi-structured interview relating to the operations of your Community Nursery, as one of three selected in the Hawkesbury Nepean for a case study covering urban, peri-urban and rural areas;
2. forwarding a volunteer survey to your nursery volunteers. A copy of the volunteer survey is attached.

The interviews and surveys are being undertaken as part of a Masters of Environmental Science research project which is examining the contribution community nurseries make to biodiversity conservation and the contribution of volunteers to community nurseries.

The volunteer survey is seeking data about community nursery volunteers – their demographics, their volunteer contribution, their motivations for volunteering and their satisfaction with their experience in the community nursery. It also seeks to identify the barriers to increased levels of volunteering and to find out what nursery volunteers identify as their key training needs.

Other questions relate to how community nursery volunteers perceive the biodiversity values in their Shire, their concern about biodiversity loss, their understanding of local provenance and their perception of their contribution.

The interview with Community Nursery managers will focus on nursery operations – staffing and production levels, volunteer engagement, local provenance seed supply, and the key factors restricting expansion in the Community Nursery's local provenance plant production.

Your participation in this research is voluntary and will be much appreciated. The research report will be made available to you at the conclusion of the research project. The research will provide a clearer picture of the role Community Nurseries, and their volunteers, play in biodiversity conservation. We hope it will help them engage better with their volunteers and better understand their needs and motivations. The raw research data will be stored securely and archived in AUSCCER according to UOW archiving policies.

Please consider this invitation carefully and contact me at 4868 0772 or 0418 424524 (business hours) or on 0408 925725 (after hours) re your participation.

Yours sincerely

Paul Marshall  
Master of Environmental Science candidate



## 9.8 Appendix 8: Environment & Sustainability branch manager's survey

### Council Environment Branch Manager Survey Questions

#### Questions about Council's environment policy and staffing levels

1. For how many years has Council had an Environment Branch? (please circle)

1-3   4-6   7-9   10-12   13-15   16-18   19+

Additional comments:

.....  
.....  
.....

2. For how many years has Council had Environment and Sustainability Policies? (please circle)

1-3   4-6   7-9   10-12   13-15   16-18   19+

Additional comments:

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.....  
.....

3. How many Council staff are dedicated to delivery of environment policy outcomes? (please circle)

1-3   4-6   7-9   10-12   13-15   16-18   19+

Additional comments:

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.....

4. Does Council charge an Environment Levy to help it deliver its environment policy objectives? (please circle)                      yes                      no

If an Environment Levy is charged, for how many years has this been in place? (please circle)

1-3   4-6   7-9   10-12   13-15   16-18   19+

Additional comments:

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**Questions about the establishment of Council’s Community Nursery**

5. For how many years has Council operated a Community Nursery? (please circle)

1-3 4-6 7-9 10-12 13-15 16-18 19+

Additional comments:

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.....

6. How significant were the following factors in the decision to establish Council’s Community Nursery?

(please circle)

- A. Support Council’s Biodiversity Strategy low 1----2----3----4----5 high
- B. Improve availability of local provenance plants low 1----2----3----4----5 high
- C. Free plants for Council’s Bushcare program low 1----2----3----4----5 high
- D. Cheaper plants for Landcare projects on farms low 1----2----3----4----5 high
- E. Increase community volunteer opportunities low 1----2----3----4----5 high
- F. Provide a social hub for Bushcare volunteers low 1----2----3----4----5 high
- G. Location for local provenance seed storage low 1----2----3----4----5 high
- H. Free plants for Council’s parks & gardens low 1----2----3----4----5 high
- I. Grow plants for Council’s free trees scheme low 1----2----3----4----5 high
- J. Other factors as outlined below low 1----2----3----4----5 high

Additional comments:

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.....

7. What proportion of the Community Nursery **setup costs** was funded through grants? (please circle)

0%   1-25%   25-50%   51-75%   100%   unsure

Additional comments:

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**Questions about resourcing levels for the Community Nursery**

8. What is Council’s current annual budget allocation for the Community Nursery? (please circle)

<\$15,000   \$15-30,000   \$30-45,000   \$45-60,000   \$60,000+

Additional comments:

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.....

9. Has the budget allocation for the Community Nursery changed in the last 5 years? (please circle)

25%+ reduction   0-24% reduction   no change   0-24% increase   25%+ increase

Additional comments:

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10. How important is income from plant sales for funding the Community Nursery operating costs? (please circle)

Low importance   1----2----3----4----5   high importance   not applicable

Additional comments:

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11. Does Council have an expectation that the Community Nursery will eventually become self-funding through plant sales? (please circle)      yes      no

Additional comments:

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**Questions about support for the Community Nursery in the community**

12. How would you rate the **Councillor's** level of support for the Community Nursery? (please circle)

Low level support 1----2----3----4----5 very strong support

Additional comments:

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.....

13. How would you rate the general community awareness of the Community Nursery?

Low awareness 1----2----3----4----5 high awareness

Additional comments:

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14. Have local commercial nurseries expressed concern to Council that the Community Nursery burdens them with unfair competition? (please circle)

No      yes      Not applicable

Additional comments:

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.....

15. How likely is it that Council will invest in a significant expansion of the Community Nursery in the next 5 years? (please circle)

Very low likelihood 1----2----3----4----5 very high likelihood

Additional comments:

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## 9.9 Appendix 9: Cover letter to council Environment Branch managers



### Department of Geography and Sustainable Communities

April 2014

Manager  
Environment & Sustainability branch  
Local Government Authority

#### **Re: Community Nursery Research Project**

Dear

I am seeking your participation in a semi-structured interview relating to the Community Nursery supported by your Council.

Your Community Nursery has been selected for case study research comparing urban, peri-urban and rural Community Nurseries in the Hawkesbury Nepean catchment and their contribution to delivery of biodiversity outcomes.

The interviews are being undertaken for a Masters of Environmental Science research project examining the contribution community nurseries make to biodiversity conservation. A survey has been developed for completion by Community Nursery volunteers and a set of interview questions for the Community Nursery managers/coordinators.

The volunteer survey is seeking data about community nursery volunteers – their demographics, volunteer contribution, motivations for volunteering, the barriers to volunteering and their key training needs. Other questions relate to how community nursery volunteers perceive the biodiversity values in their Shire and their concern about biodiversity loss.

The interviews with Community Nursery managers will focus on nursery operations – staffing and production levels, volunteer engagement, local provenance seed supply, and the key factors restricting expansion in the Community Nursery's local provenance plant production.

Your participation in this research is being sought so we can better understand how your Community Nursery relates to your Council's Environment Strategy and Biodiversity Conservation objectives. The questions we wish to ask you focus on the financial and in-kind support Council provides to your Community Nursery, and how well the Community Nursery delivers outcomes of value to Council.

The semi-structured interview session will take approximately 30 minutes and would be scheduled in June-July at a time convenient to you. If you are not the appropriate officer to respond to this request please refer this to the officer who is responsible for these matters. It would be appreciated if you could contact me during business hours on 4868 0772 or 0418 424524 re your participation. Alternately I can be contacted at [marshall@spiderweb.com.au](mailto:marshall@spiderweb.com.au)

Yours sincerely

Paul Marshall  
Master of Environmental Science candidate

## 9.10 Appendix 10: Ethics approval for research



RENEWAL APPROVAL LETTER  
In reply please quote: HE14/174

4 September 2015

Mr Paul Marshall

Dear Mr Marshall,

Thank you for submitting the progress report. I am pleased to advise that **renewal** of the following Human Research Ethics application has been **approved**.

Ethics Number: HE14/174

Project Title: Examining the contribution of 'community nurseries' to biodiversity conservation in rural, peri-urban and urban areas

Researchers: Mr Paul Marshall, Professor Lesley Head

Renewed From: 6 June 2015

New Expiry Date: 5 June 2016

Please note that approvals are granted for a twelve month period. Further extension will be considered on receipt of a progress report prior to expiry date.

This certificate relates to the research protocol submitted in your original application and all approved amendments to date. Please remember that in addition to completing an annual report, the Human Research Ethics Committee also requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforeseen events that might affect continued ethical acceptability of the project.

A condition of approval by the HREC is the submission of a progress report annually and a final report on completion of your project. The progress report template is available at <http://www.uow.edu.au/research/ethics/UOW009385.html>

This report must be completed, signed by the appropriate Head of School and returned to the Research Services Office prior to the expiry date.

Yours sincerely,

Associate Professor Melanie Randle  
**Chair, UOW Social Sciences  
Human Research Ethics Committee**

*The University of Wollongong/ Illawarra and Shoalhaven Local Health Network District (ISLHD) Social Science HREC is constituted and functions in accordance with the NHMRC National Statement on Ethical Conduct in Human Research.*

Ethics Unit, Research Services Office  
University of Wollongong NSW 2522 Australia  
Telephone (02) 4221 3386 Facsimile (02) 4221 4338  
Email: [rso-ethics@uow.edu.au](mailto:rso-ethics@uow.edu.au) Web: [www.uow.edu.au](http://www.uow.edu.au)