



## REPORT

*Evaluation of landholder expectations, goals, practices and knowledge in relation to the management of their native vegetation.*

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A report on the results of land holder surveys conducted in the Humula, Kyeamba Valley, and Bethungra/Illabo/Junee area as part of Murrumbidgee Landcare's *Cross Property Planning to balance production and biodiversity conservation on mixed farms in the Central Murrumbidgee* project. This report has been prepared for the project steering committee and Cross Property Planning (CPP) land holder participants.

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## **Abbreviations**

ANU: Australian National University

BGGW: Box Gum Grassy Woodlands

CiL: Communities in Landscapes

CMA: Catchment Management Authority (now Local Land Services, LLS)

CMN: Conservation Management Network

CPP: Cross Property Planning

DPI: Department of Primary Industries (NSW)

DSE: Dry sheep equivalent

IPM: Integrated pest management

LHPA: Livestock Health and Pest Authority (now Local Land Services, LLS)

NRM: Natural Resource Management

## **Acknowledgements**

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## **Overview of the Cross Property Planning Project**

The Cross Property Planning (CPP) project is a community partnership with Murrumbidgee Landcare Inc. and landholder groups to address the issue of ongoing degradation of native vegetation in the Central Murrumbidgee. Native vegetation in this region, especially the endangered Box Gum Grassy Woodland (BGGW), now exists predominantly in small, scattered patches on multiple tenures. This project implements the proven cross-property approach to link and enhance the fragmented remnants in the landscape. The project involves the engagement of landholders on connected properties, education and capacity-building to foster understanding and awareness, and implementation of on-ground works. The project was developed out of the expressed desire of local landholders to work together to protect and restore our native vegetation.

The project aims to enhance the condition and connectivity of native vegetation including the endangered inland Grey Box Woodland, White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (collectively Box Gum Grassy Woodlands, BGGW). BGGW contain habitat suitable for several nationally threatened species, including the Swift Parrot and Regent Honeyeater, and the endangered Wagga LGA population of Squirrel Gliders.

The project seeks to achieve its aim to regenerate, conserve and connect remnant native vegetation ecosystems within the Kyeamba Valley, Humula and Bethungra/Illabo/Junee districts through the development and implementation of cross-property vegetation management, focussing on revegetation, protection and regeneration of remnants to build connectivity across the landscape.

The project works closely with landholders across the three CPP project areas to develop and implement cross-property biodiversity plans, with the target of linking at least 2,400 ha of key biodiversity habitat across the landscape. On-ground works being implemented on properties to date includes revegetation, fencing, appropriate grazing strategies, and other sustainable land management techniques.

Throughout June, July and August 2013, thirty-five landholders involved in the Murrumbidgee Landcare Inc. CPP Project were surveyed to gain a greater understanding of their current expectations, goals, practices and knowledge in relation to the management of their native vegetation.

The results from these surveys is being used to assist Murrumbidgee Landcare Inc. to more effectively deliver their extension strategies to better address the needs of local landholders and work more effectively with local landholders to protect and restore our native vegetation.

## **Methodology**

After an initial scoping meeting with the CPP Steering Committee to determine the base-line data that needed to be collected in terms of landholder's current expectations, goals, practices and knowledge in relation to the management of their native vegetation, the survey instrument was developed in consultation with Lauren Howard, Charles Sturt University.

The survey instrument consisted of 103 questions broken into nine sections: the farm operation; fertilisers and native pastures; natural resource management (NRM) on farm; water sources; paddock trees and tree planting; pest animals that threaten production or biodiversity on farm; weed species that threaten production or biodiversity on farm; farm planning; and sources of information.

Surveys were conducted as face-to-face formal interviews with individual landholders and one interviewer. Interviews generally took 1 ½ hours to complete. A total of 35 interviews were conducted across the three Cross Property Planning areas: Kyeamba Valley, Humula, and Bethungra/Illabo/Junee.

## Results

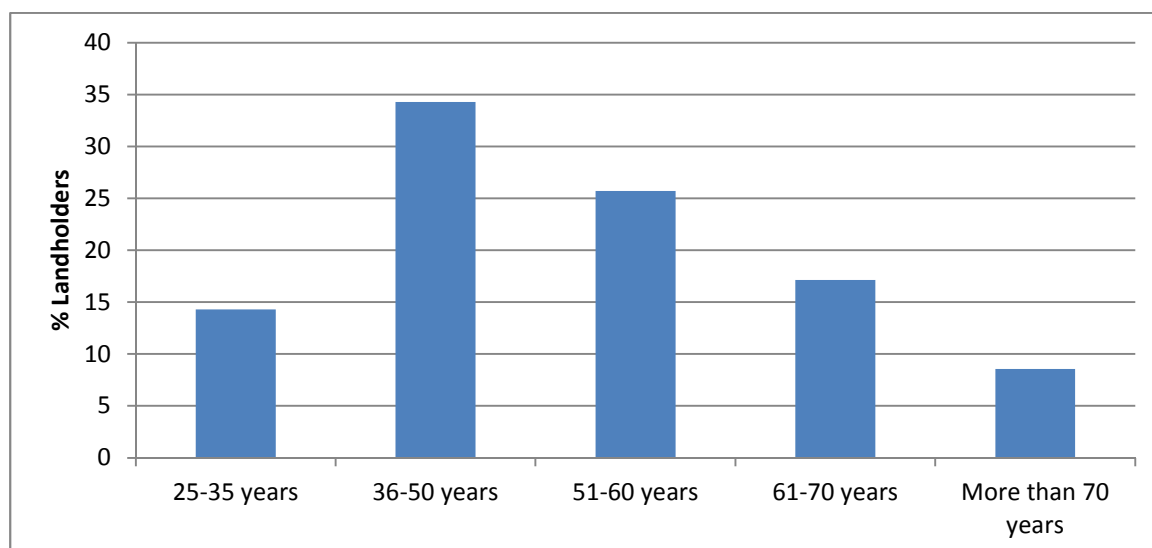
### 1. The Farm Operation

#### *Enterprise Mix*

Livestock dominated mixed farming (57%) was the main farm enterprise mix across the three CPP groups followed by livestock only (31%). Property sizes varied considerably from 41 hectares to 36,437 hectares amongst surveyed landholders with the median property size being 676 hectares. The total area managed by the 35 landholders across the three CPP groups was 68,765 hectares.

#### *Time Spent Managing their Property*

Over 60% of landholders surveyed in the CPP project have been involved in the management of their property for 15 years or more with one landholder being involved with the management of their property for 50 years. The average number of years spent managing the property was 18 years. These figures were reflected in the age of the landholders surveyed with over 50% being over the age of 51 years (figure 1).



*Figure 1. Age of landholders surveyed*

### Future Plans for the Farm Business

40% of landholders surveyed are not planning to change their business in the short or longer term, while over a third are planning to expand their business as funds become available (figure 2). The number of landholders planning to expand their farm business may be influenced by the number of landholder's who said that they had family members interested in being involved in the property in the future (40%).

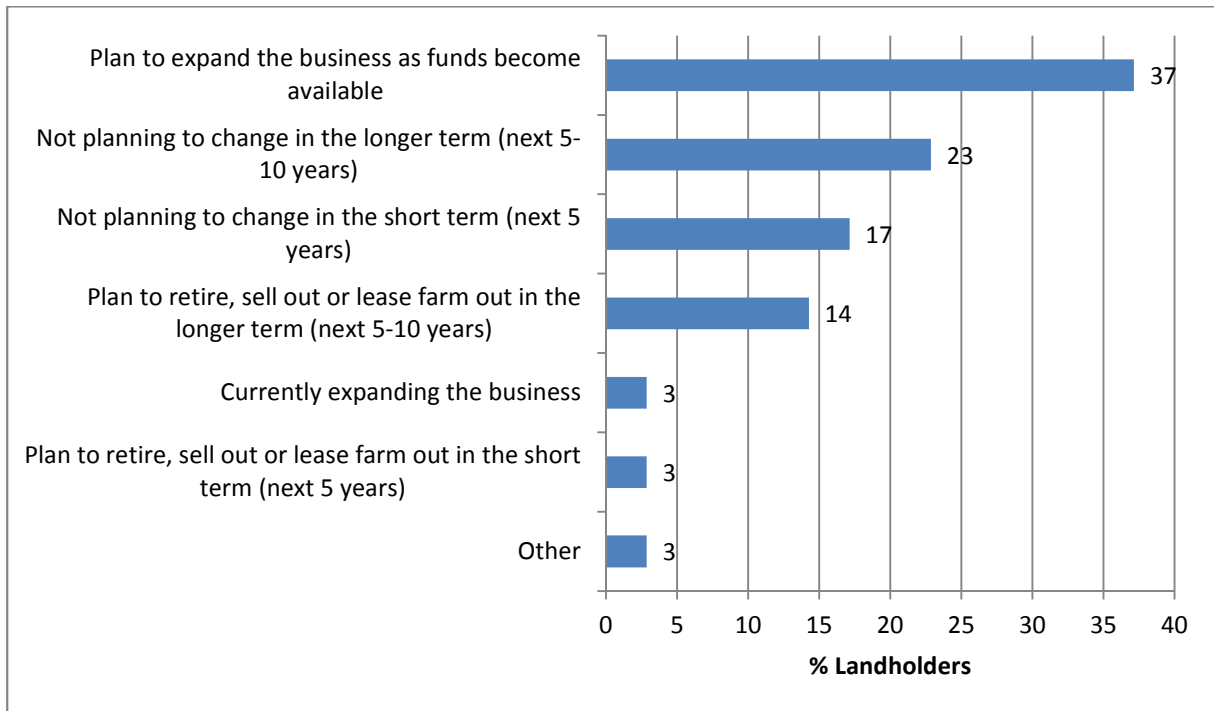


Figure 2. Future plans for the farm business

In the past 5 years, 57% of landholders have made important changes on their farm. Changes included: fencing for improved grazing management (20%); installation of troughs and dams across the property (20%); tree planting for biodiversity; tree planting for erosion control (10%); pasture improvement (10%); change of ownership/management (10%); and change of enterprise mix (7%).

The most common reason for the changes are to improve useability and ease of management for landholders (39%) with fencing for grazing management and installation of trough and dams, followed by an increased interest in biodiversity (13%) resulting in increased tree planting across the property (figure 3).

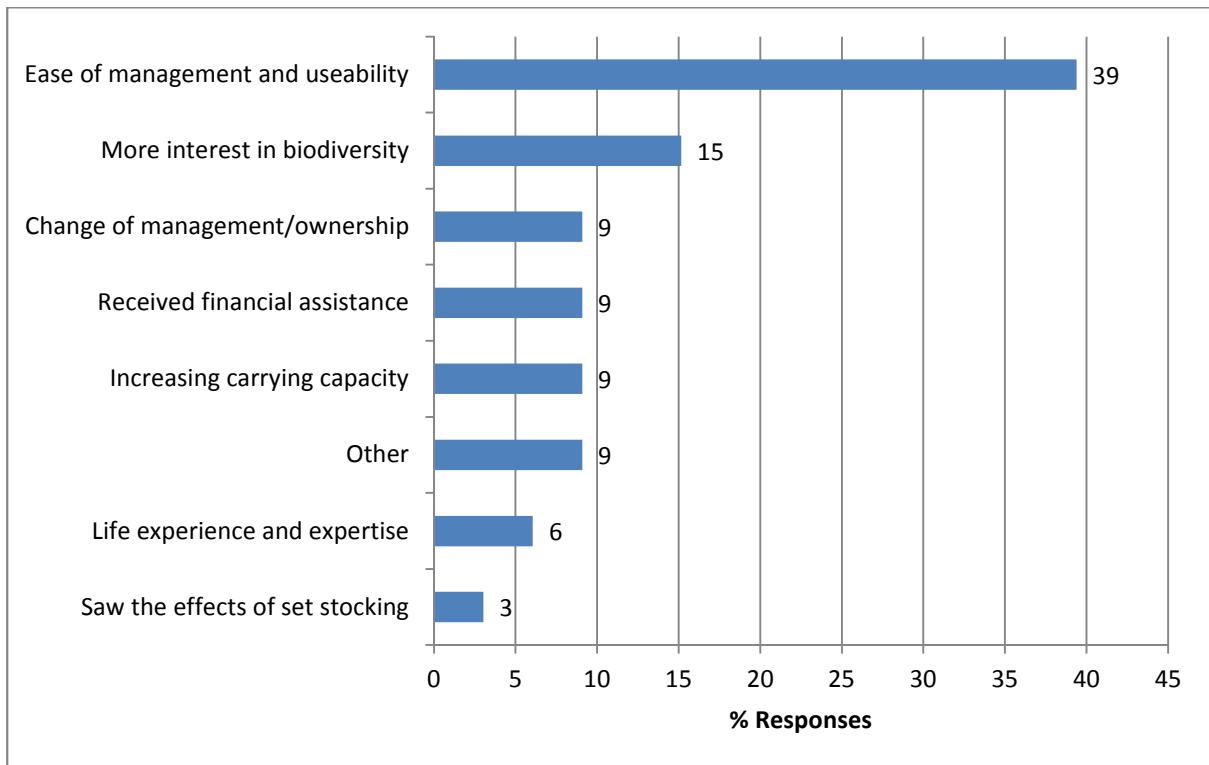


Figure 3. Reasons for changes in past 5 years on surveyed farms

Landholders were asked if and when they eventually leave farming, what sort of achievements would they like to have made (figure 4). Many of the desired achievements related to natural resource management (NRM) outcomes and profitability such as, improvements in biodiversity (16%), profitable and environmentally sound (11%), and stabilisation of soils and creeks (10%).

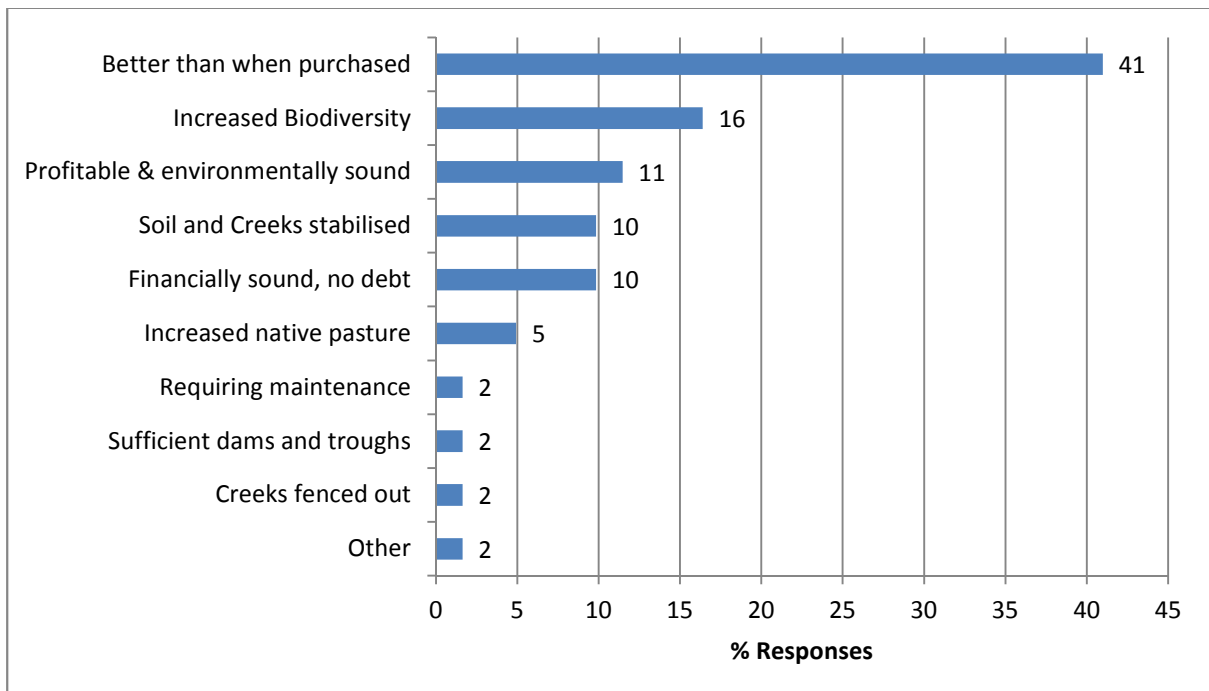


Figure 4. Proposed achievements made on farm by landholders over their lifetime



### Grazing Management and Stocking Rates

Grazing systems that are used by surveyed landholders included set stocking, time controlled grazing, tactical grazing and rotational grazing. Over half (55%) of the landholders use a combination of grazing systems on their properties depending on such factors as availability of feed, time of year, type of stock, water sources and paddock sizes.

Average stocking rate (DSE/ grazed area of farm) of properties ranged from 0 dse/ha to 20 dse/ha, with an average and median of 6 dse/ha.

When asked how their stocking rates compared to the district average 31% of respondents believed that their stocking rate was higher and 40% believed their stocking rate was lower than the district average. Another 14% of landholders thought that their stocking rate was about the same as the district average and 14% were unsure. When landholder stocking rates were compared to average dse/ha for this survey (6 dse/ha), 43% of landholders had higher stocking rates, with 40% lower.

The majority of landholders (60%) planned to maintain their current stocking rate, with 29% planning to increase their stocking rate during the next 5 years. Required management changes to increase their stocking rate are listed in figure 5.

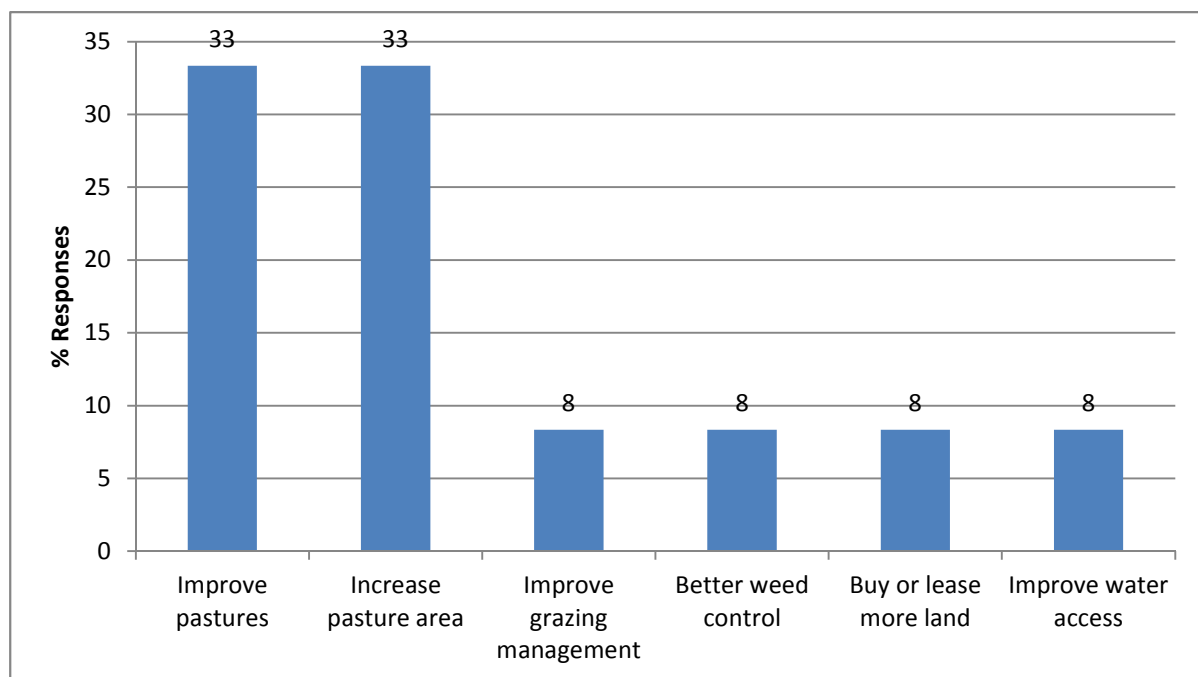


Figure 5. Management changes required to increase stocking rates

## 2. Fertiliser and Native Pastures

Thirty-five percent of landholders surveyed applied fertiliser to their native pastures. The most commonly applied fertiliser was single superphosphate with or without molybdenum (35%) followed by lime (12%).

## 3. Natural Resource Management on Farm

Landholders were asked which natural assets (e.g. soil, water, vegetation, wildlife, landscape) they valued the most using their own selection criteria (eg. production value, aesthetic value). The majority of landholders surveyed found it difficult to identify a single natural asset that they valued most on their properties. Instead landholders appear to place equal value on their riparian areas, their soils, vegetation, and wildlife across their properties, with many unable to select just one asset (figure 6).

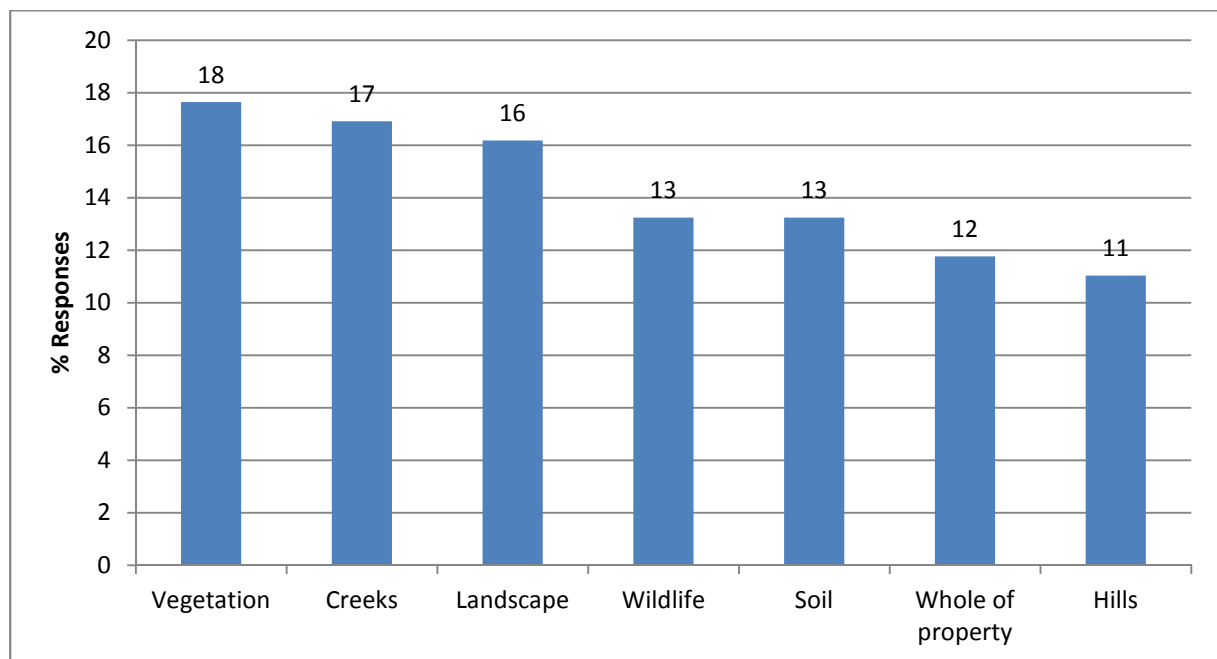


Figure 6. Natural assets valued most highly by landholders

The majority of landholders (89%) had previously carried out NRM work on their properties. Most of this work involved revegetation for various purposes including wildlife corridors, shelter belts and erosion control (figure 7).

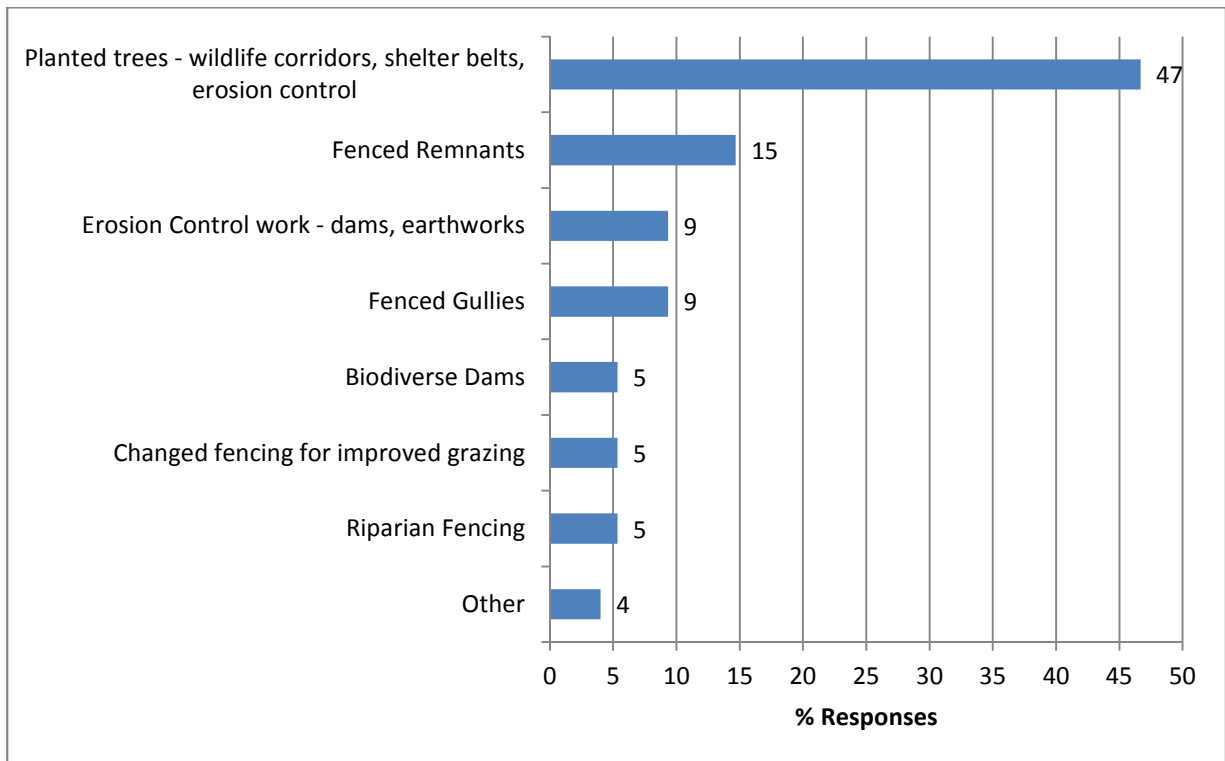


Figure 7. Past NRM work carried out on surveyed properties

Seventy-one percent of surveyed landholders had received funding to assist with their past NRM work. Funding sources included Catchment Management Authority (CMA) grants, Communities in Landscapes (CiL) funding through the Federal Government and Landcare (figure 8).

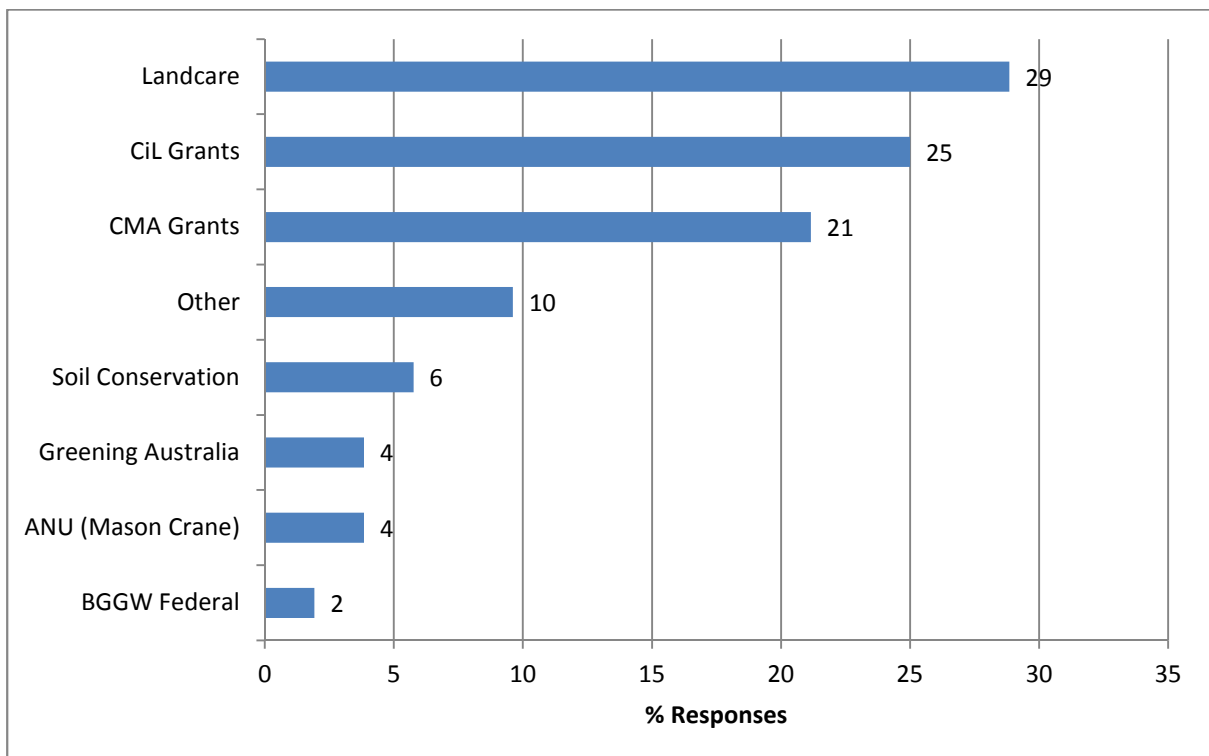


Figure 8. Sources of financial assistance for NRM work

The importance of financial assistance to complete NRM work on properties cannot be discounted with 88% of surveyed landholders citing available time and funds the main reasons for delays in the completion of NRM work (including increasing native habitat) on their properties, with the remaining 12% citing seasonal conditions.

The majority of proposed NRM work on surveyed properties involves revegetation (figure 9).

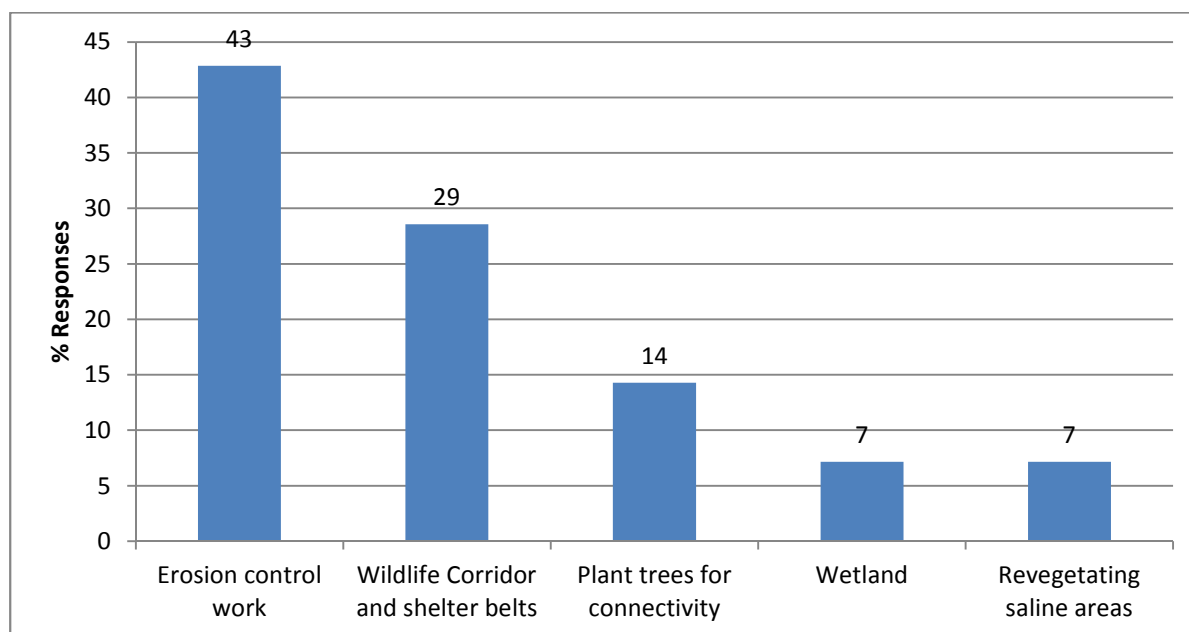


Figure 9. Proposed NRM work on surveyed properties

### Biodiversity

Landholders were asked what the term 'biodiversity' meant to them. Responses ranged from an increase in birds (3%), diversity of life (3%), more native grasses (3%), the linkage of flora and fauna together with land management (9%), the protection and enhancement of what already exists (11%) and the balance of production and environment (17%). Another 14% of surveyed landholders were unsure of what the term meant.

Australia's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) defines biodiversity as the variability among living organisms from all sources and includes diversity within species, between species and of ecosystems.

Given this definition the project seeks to increase biodiversity through the protection and enhancement of existing native vegetation, biodiverse plantings to provide new habitat and linkages, and invasive species management.

Landholders were then asked to list the perceived threats to biodiversity on their properties. A third of landholders (33%) believe that the biggest threat to biodiversity is natural disasters (fire, flood, drought) followed by feral animals (28%) (figure 10). Loss of native vegetation was not listed separately as a threat to biodiversity but we can assume landholders included it in the impact of natural disasters.

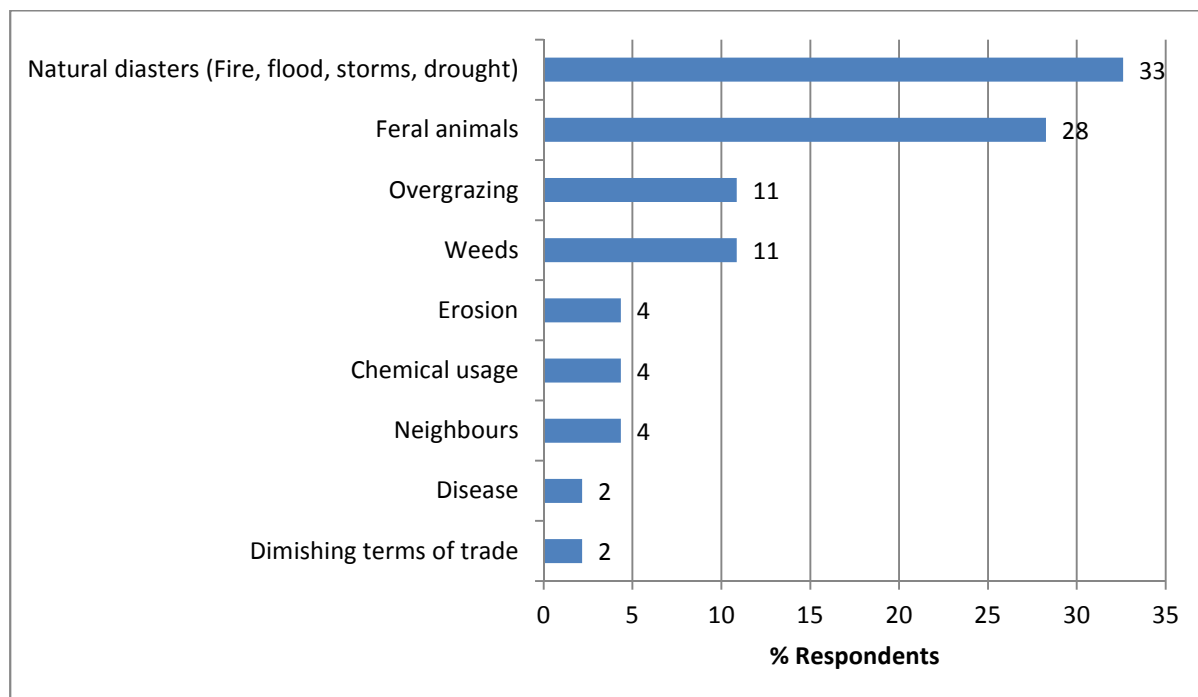


Figure 10. Landholder perceived threats to biodiversity

Many landholders are already actively working to reduce their perceived threats to biodiversity on their properties (figure 11). The majority of work was aimed at the control of invasive species (pest animal and exotic plants). Interestingly, of the landholders surveyed only 3% reported that they were specifically protecting trees and 7% are planting more trees to reduce the threats to biodiversity. However 47% of landholders stated that they had previously planted trees on their properties and 74% state later in this report that they are protecting their paddock trees and remnants to manage stock access to them. This indicates that loss of habitat through the removal or decline of existing remnants and the role of revegetation are not directly associated with the protection and enhancement of biodiversity by surveyed landholders.

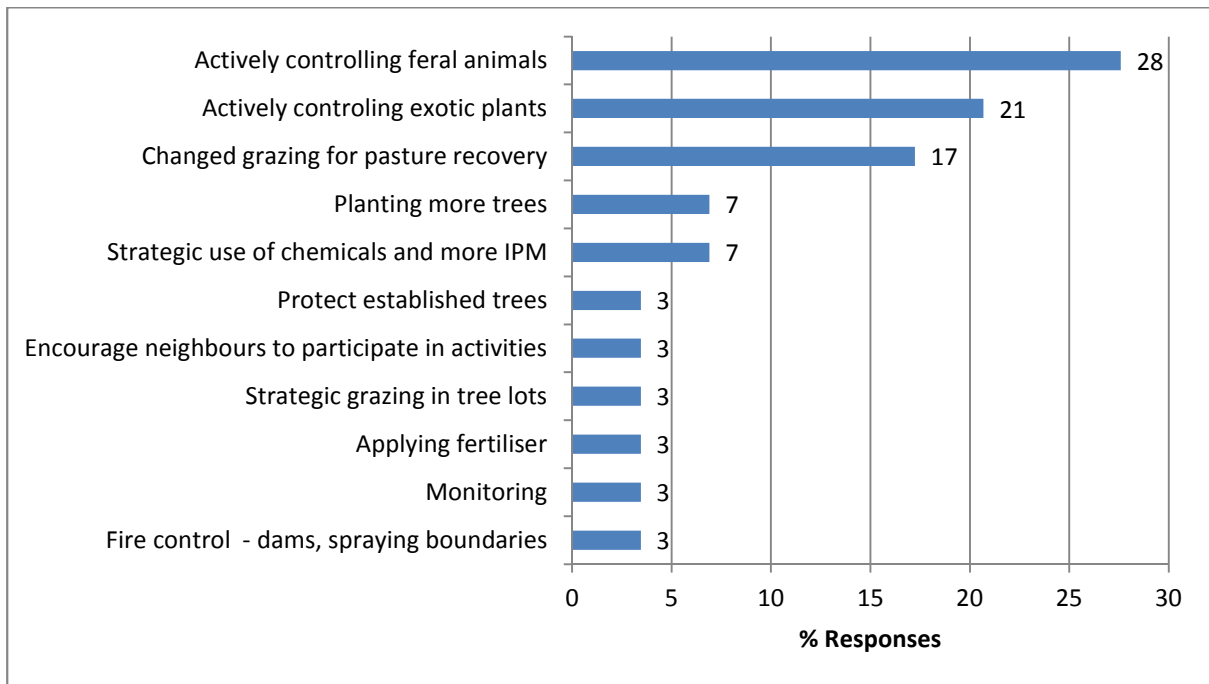


Figure 11. Landholder actions to reduce threats to biodiversity

### *Native Habitat on Properties*

When asked how important it was to have areas of native habitat on their properties 97% of landholders responded that it was important/very important. This importance was reflected in the desire by the majority of landholders (66%) to increase the area of their native habitat on their properties.

The quality of existing native vegetation on surveyed landholder properties was ranked as good/very good by 77% of landholders which is positive.

### *Connectivity and Wildlife Corridors*

The term connectivity in relation to native habitat meant the 'connection of vegetation for wildlife to get from place to place' for 77% of surveyed landholders. Another 14% were unsure of what the term meant. The project aims to increase connectivity throughout properties and beyond property boundaries to provide habitat for a greater diversity of species. Connectivity with existing native vegetation remnants can be achieved through the planting of wildlife corridors and even scattered paddock trees which can act like stepping stones for wildlife across the landscape from one large remnant patch to another.

The majority of landholders could relate to the term wildlife corridor and its purpose with one landholder stating that the term meant to him "Providing continuous corridors for safe passage of fauna to move across the landscape".

### Endangered Species

Endangered species were reported as being present on 43% of the properties surveyed. The most common species included the Superb Parrot (*Polytelis swainsonii*) and other small insectivorous woodland birds (figure 12). The majority of landholders are already participating in activities to protect their habitats such as revegetation and protection and enhancement of existing native vegetation (figure 13).

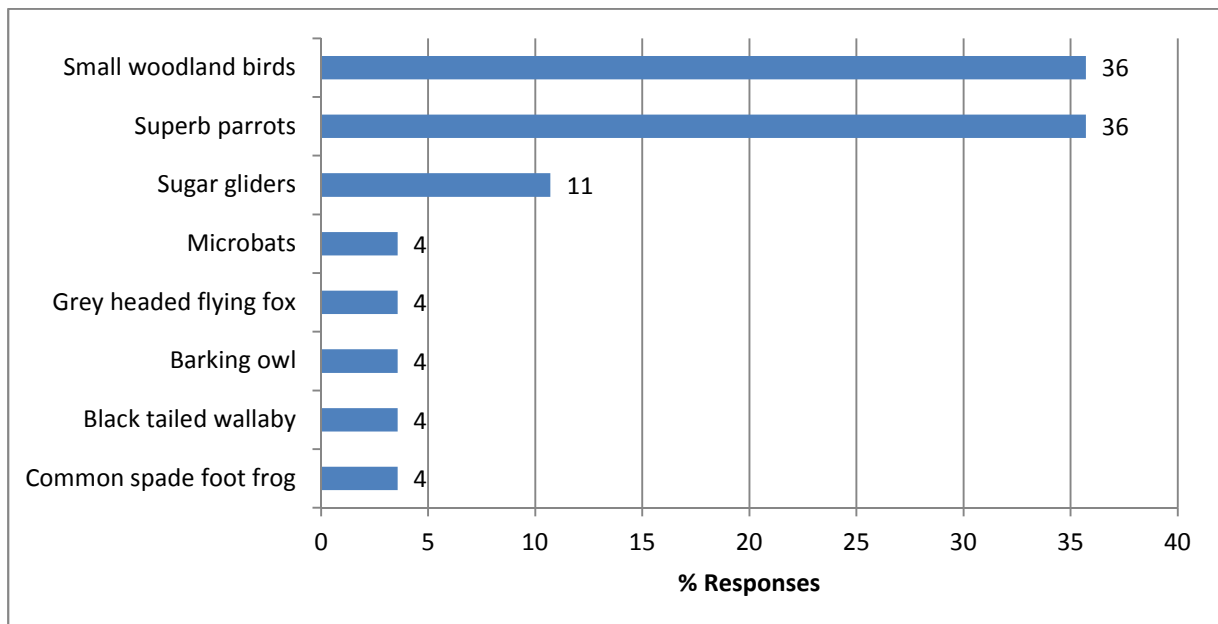


Figure 12. Identified endangered species on properties

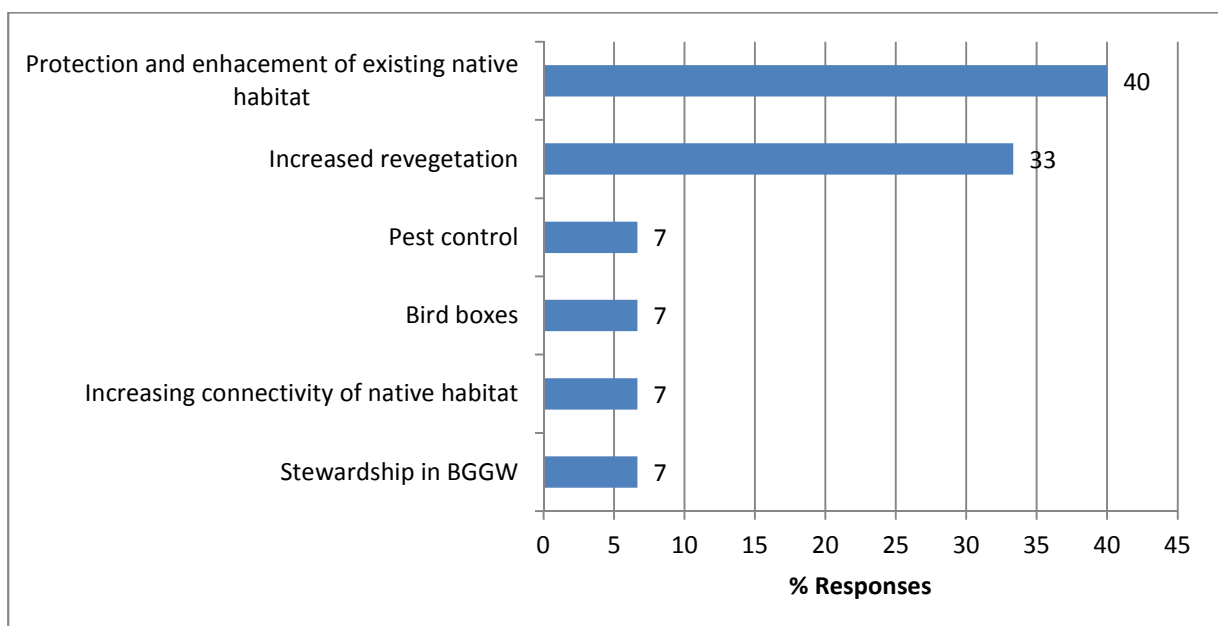


Figure 13. Landholder activities to protect endangered species

#### 4. Water Sources on Farms

Surveyed landholders use a variety of sources for stock water including water troughs (50%), natural waterways (34%), dams (9%) and bores (7%). Of those using natural waterways and troughs, 49% have restricted their stock access to them. Stock water quality, regardless of stock access, was reported as good or better by 94% of landholders.

#### 5. Paddock Trees and Tree Planting

Paddock trees play an important role in providing habitat and safe harbour to many fauna species and they are able to act as a stepping stone across the landscape between existing native vegetation remnants. The value of paddock trees and existing native vegetation areas has been acknowledged by surveyed landholders with 74% protecting their paddock trees and existing remnants to manage stock access to them. Of the landholders who do not protect their paddock trees and native areas, the most common reason was a perceived abundance of trees and native vegetation already on their properties (figure 14).

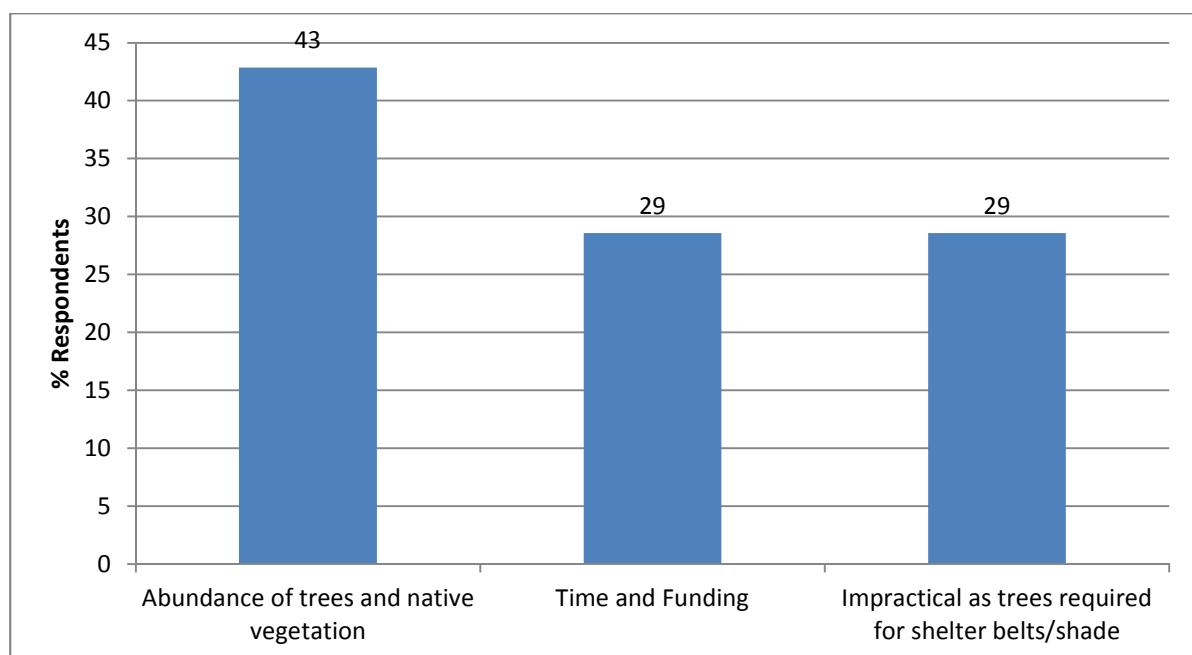


Figure 14. Reasons why trees are not protected from livestock

As stated earlier, many of the landholders surveyed have completed NRM work on their properties in the past including tree corridors and native areas. The decision on where to locate these plantings can be based on a number of factors, with the need for shade and windbreak protection for livestock being a major determinant (figure 15).



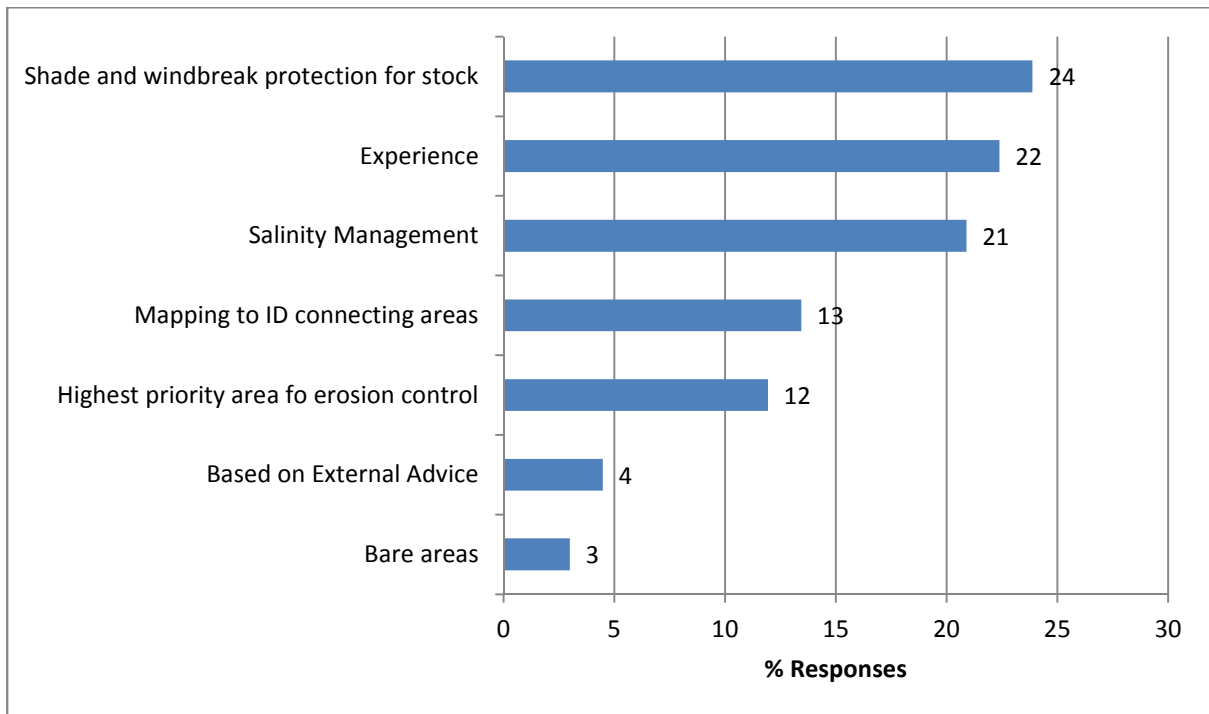


Figure 15. How landholders decide on the location of tree corridors and native areas

## 6. Pest Animals that Threaten Production or Biodiversity on Farm

The majority of surveyed landholders reported the presence of pest animals that threatened production (86%) and biodiversity (71%) on their properties. Pest animals that were perceived threats to production on properties included rabbits, foxes and kangaroos whilst perceived threats to biodiversity included foxes and feral cats (figure 16).

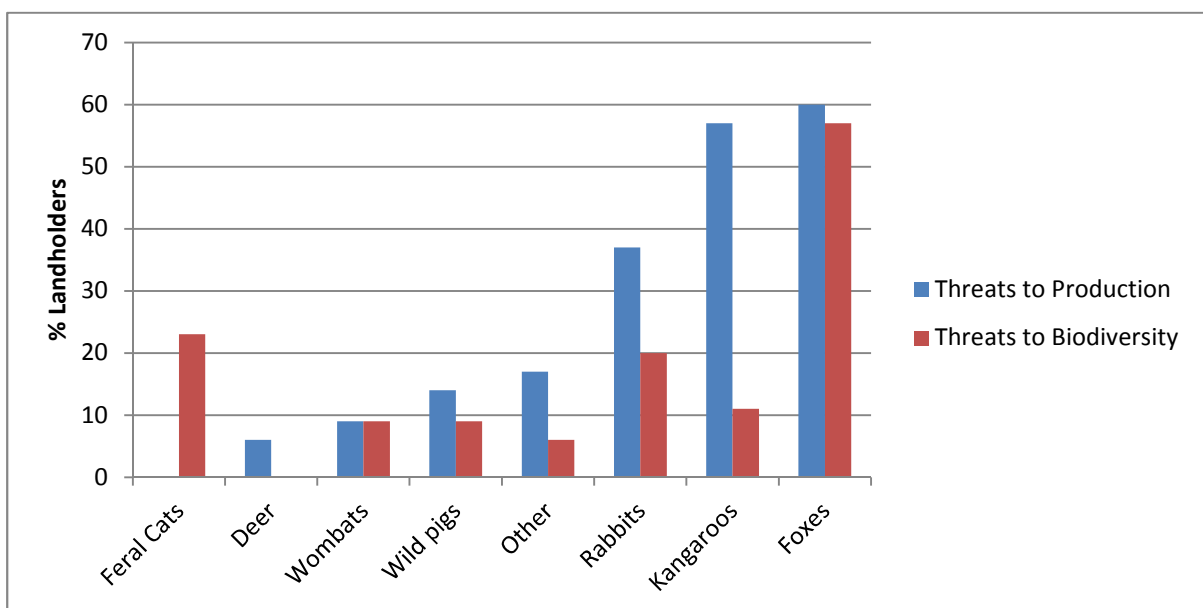


Figure 16. Perceived pest animal threats to production and biodiversity

The perceived severity of pest animal impacts on production and biodiversity differed, with landholders perceiving that pest animals had a greater impact on production. This may be due to the fact that the effects of pest animals on production are more observable than those that threaten biodiversity. Of the landholders who reported that kangaroos, rabbits and foxes threatened production, 50-65% assess the severity of their impacts on production as bad/very bad (figure 17). This is in contrast to the severity of impacts on biodiversity, with 35% or less of landholders believing that the pest animal impacts are bad/very bad. Many landholders also stated that they are unsure of the severity of impacts on biodiversity from pest animals (figure 18).

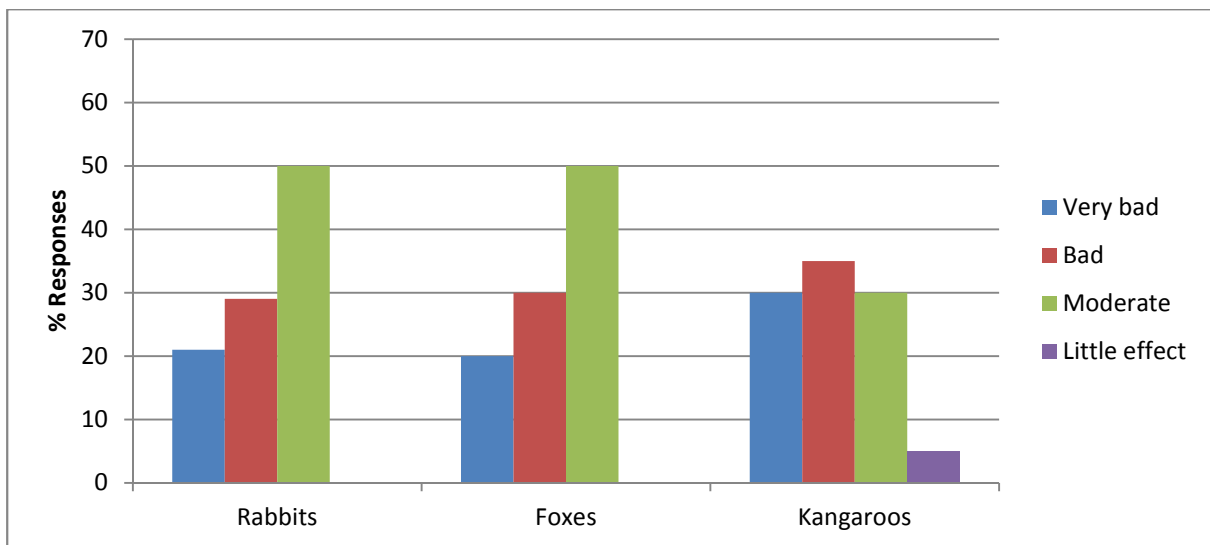


Figure 17. Severity of pest animal problem on production

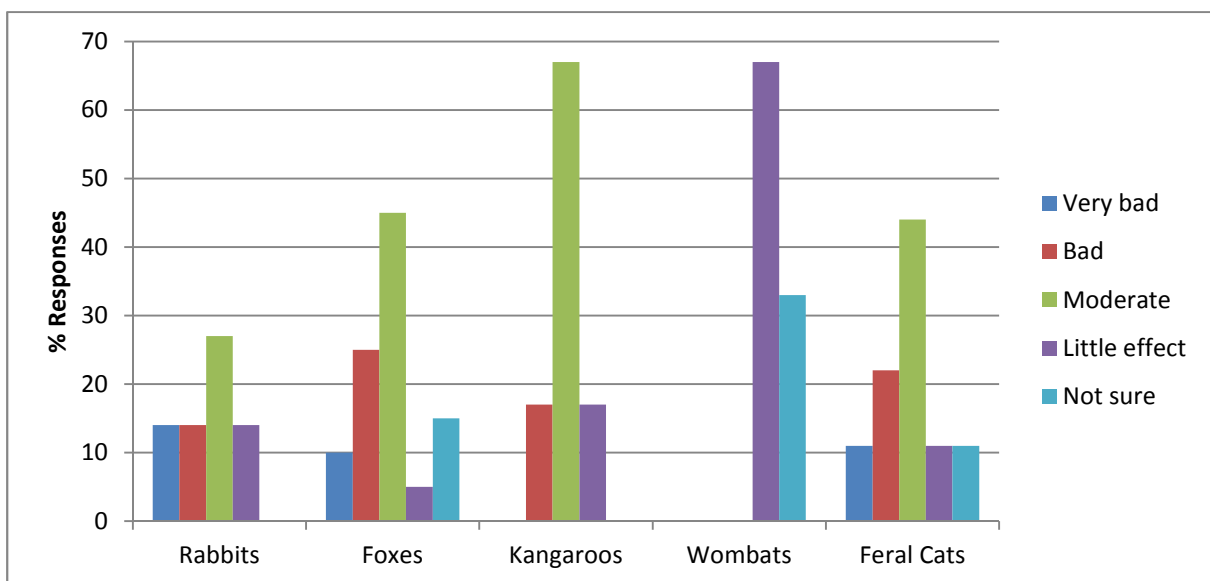


Figure 18. Severity of pest animal problem on biodiversity

The majority of surveyed landholders (60%) seek advice and information on the management of their pest animal problems. This advice is obtained through a variety of sources including Livestock Health and Pest Authority (LHPA, now Local Land Service (LLS)), Landcare, consultants, internet sources and other reference material.

Landholders manage pest animal threats through scare guns, trapping, shooting and baiting (figure 19). Landholders assess the impact of their pest management strategy through checking baits (31%), observation (ie. weaning rates etc) (34%) and visual inspection (57%). The majority of landholders (70%) implement their pest management plans across property boundaries.

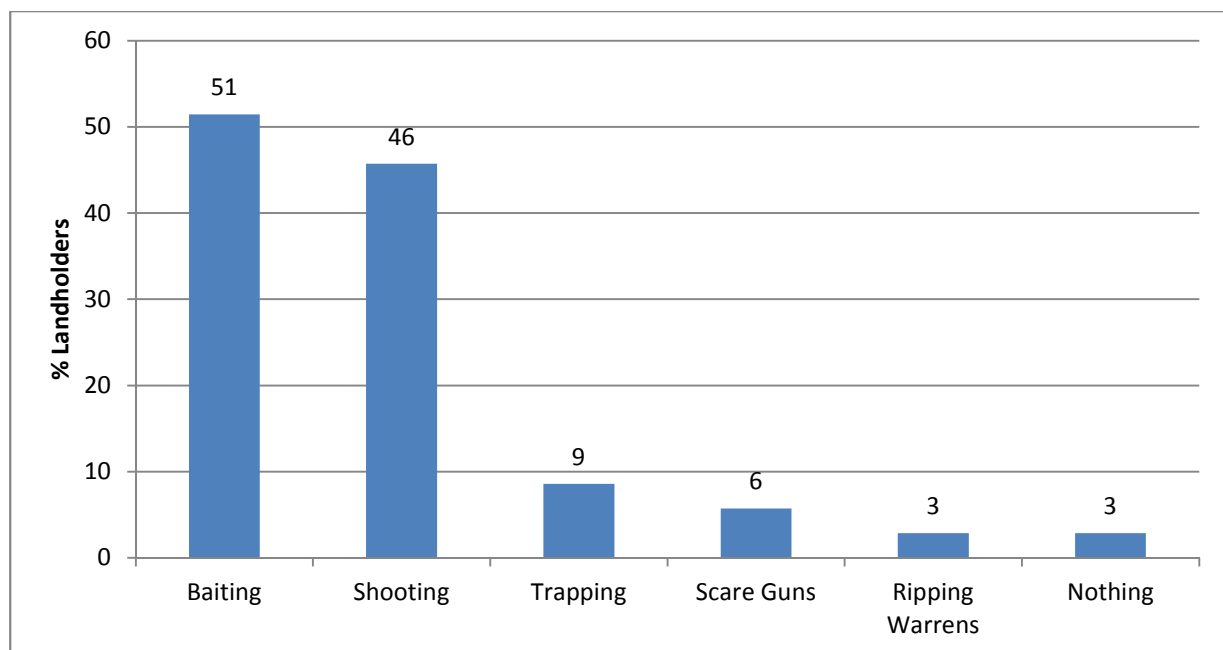


Figure 19. Management of pest animal threats to production and biodiversity on farm

## 7. Weed Species that threaten Production or Biodiversity on Farm

All surveyed landholders believed that they had weeds on their properties that threatened crop and livestock production. 57% of these landholders also believed that they had weeds on their properties that threatened biodiversity. Weed species that were perceived threats to crop production on properties included annual ryegrass (*Lolium multiflorum*), Flax-leaf fleabane (*Conyza bonariensis*), and Paterson’s curse (*Echium plantagineum*). Weeds identified as threatening livestock production included St John’s wort (*Hypericum perforatum*), Blackberry (*Rubus fruticosus*), Bathurst burr (*Xanthium spinosum*) and Paterson’s curse (*Echium plantagineum*). Threats to biodiversity included St John’s wort (*Hypericum perforatum*) and Blackberry (*Rubus fruticosus*) (figure 20).

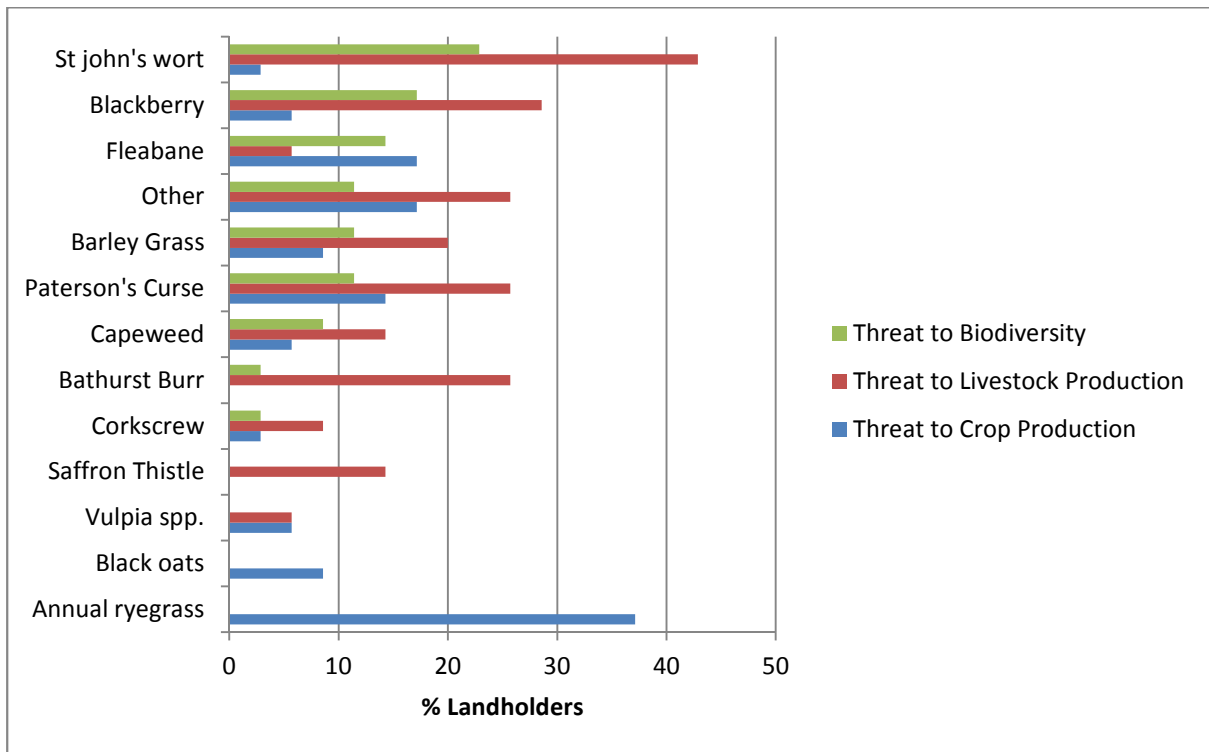


Figure 20. Perceived weed threats to crop, livestock production and biodiversity

Weed species were perceived generally to have a greater impact on biodiversity than pest animal species. Around 50% of landholders surveyed rated the severity of weed species on biodiversity as bad/very bad, whilst only 35% of landholders believed that the severity of weeds on their livestock production was bad/very bad (figure 21). Fifty percent of landholders believed that the impact of weeds on livestock production is moderate.

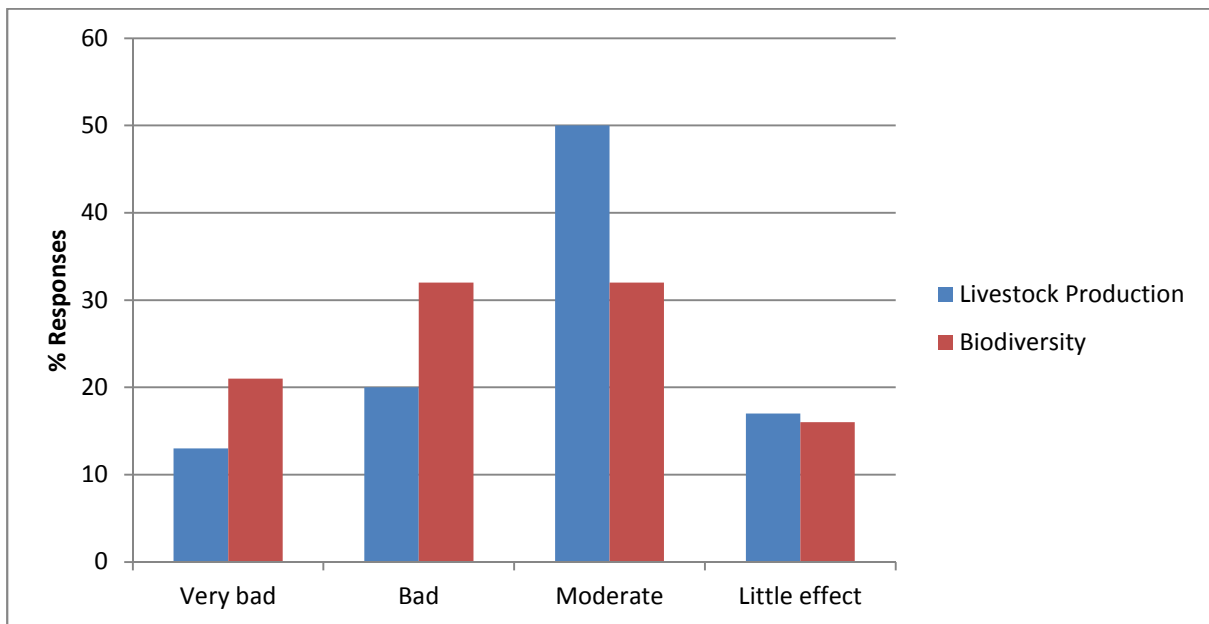


Figure 21. Severity of weeds on livestock production and biodiversity

The majority (76%) of surveyed landholders have sought advice and information on the management of their weeds. Advice and information was most often sought from resellers and private agronomists (52%), followed by Landcare (24%), NSW DPI (10%), workshops/field days (7%) and the internet and chemical representatives (3%). Weed threats are managed through chemical control, grazing management, chipping, slashing, the use of biological control and fertiliser (figure 22).

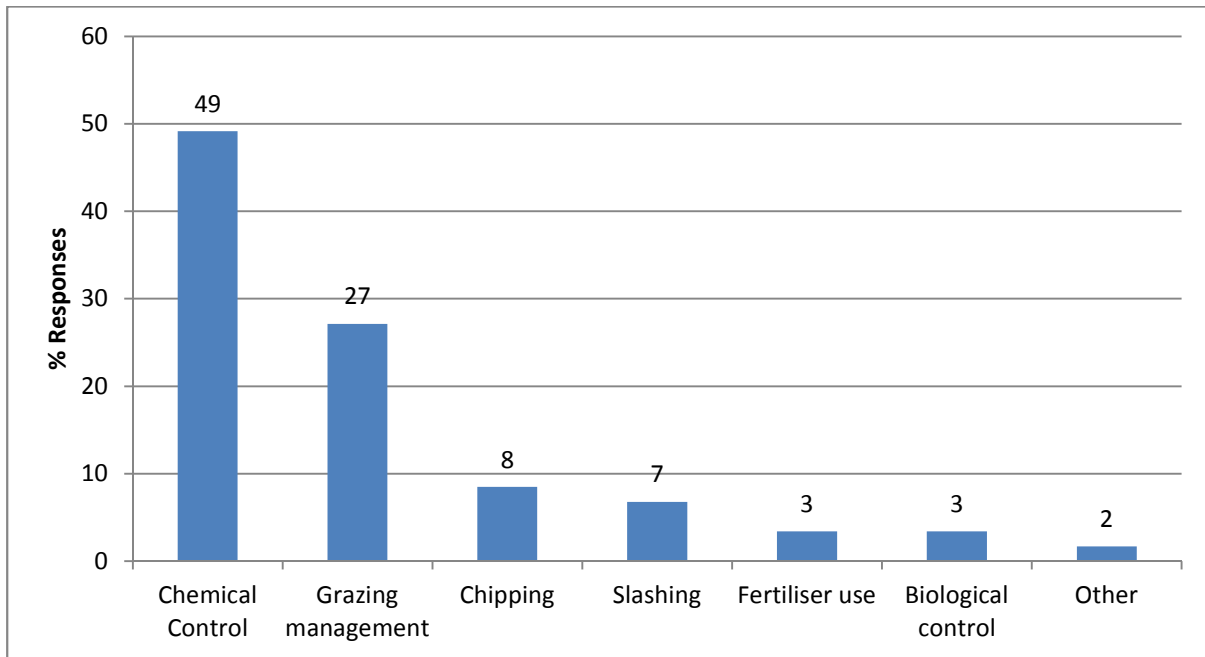


Figure 22. Management of weed species threats to production and biodiversity

Landholders assess the impact of their weed management strategy through visual inspection of infestations (73%), wool quality (11%), advice from agronomist or vet (8%), stock condition (5%) and maintenance of infestation records (3%).

Whilst the majority of landholders (60%) had discussed their weed problems with neighbours only 29% of surveyed landholders implement their weed management plans across property boundaries.

## 8. Farm Planning

Fifty-seven percent of landholders have used land management classes as an aid to planning on their farms. The most common property plans that are kept by landholders are aerial photos (46%) followed by mud maps of the property (31%).

Farm plans are used for a variety of purposes by landholders with future planning the most common (figure 23).

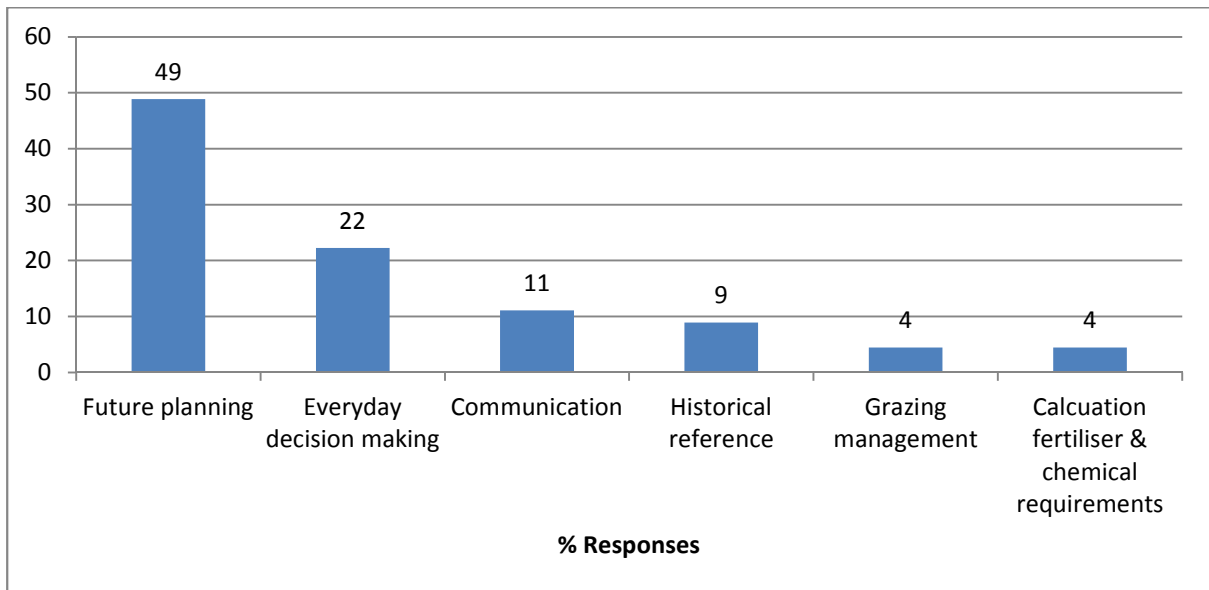


Figure 23. What farm plans are used for by surveyed landholders

## 9. Sources of Information

Surveyed landholders use a number and a variety of sources to obtain information and advice regarding NRM (figure 24). The most commonly used source is Landcare (97%), followed by other farmers (83%) and other farm/business members (69%).

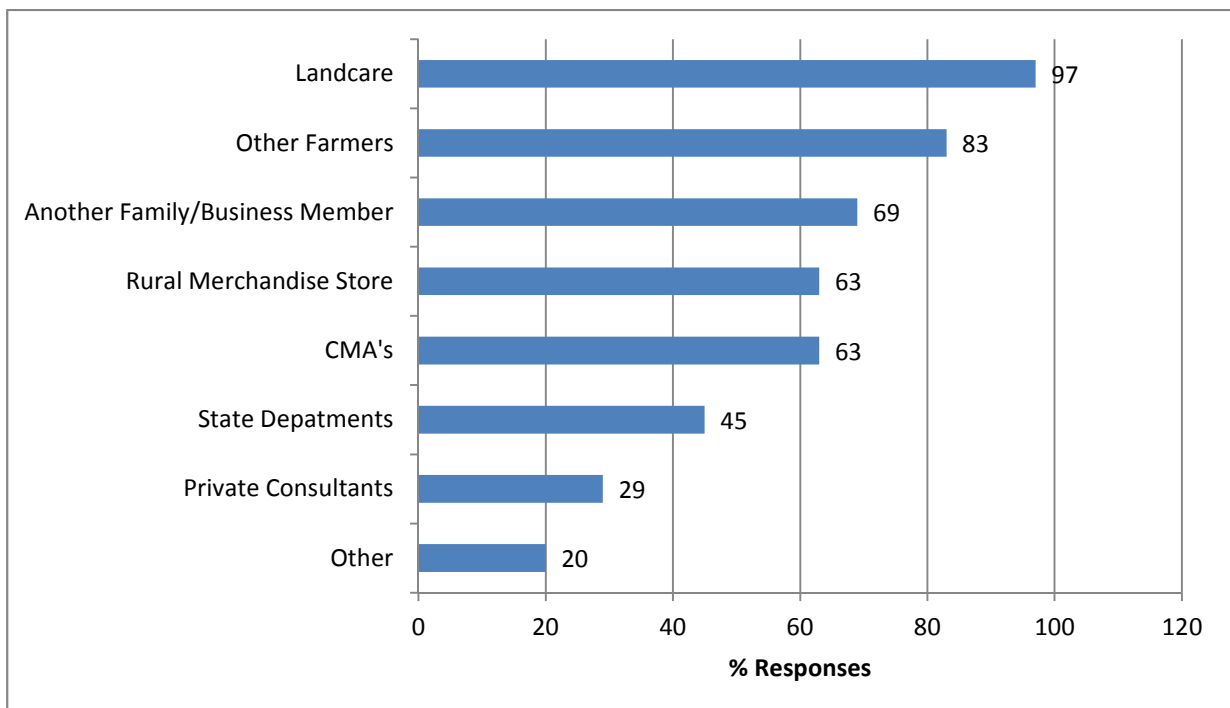


Figure 24. Sources of NRM information used by landholders

Landholders were asked to rank the usefulness and importance of each information source. Of the 69% of surveyed landholders who use other landholders and family/business members, all believed that this information and advice on NRM was useful/very useful.

Of the 29% of landholders who used private consultants, 90% ranked their advice as very useful. Of the 97% of landholders who use Landcare for advice and as a source of information 91% ranked it as useful/very useful (figure 25).

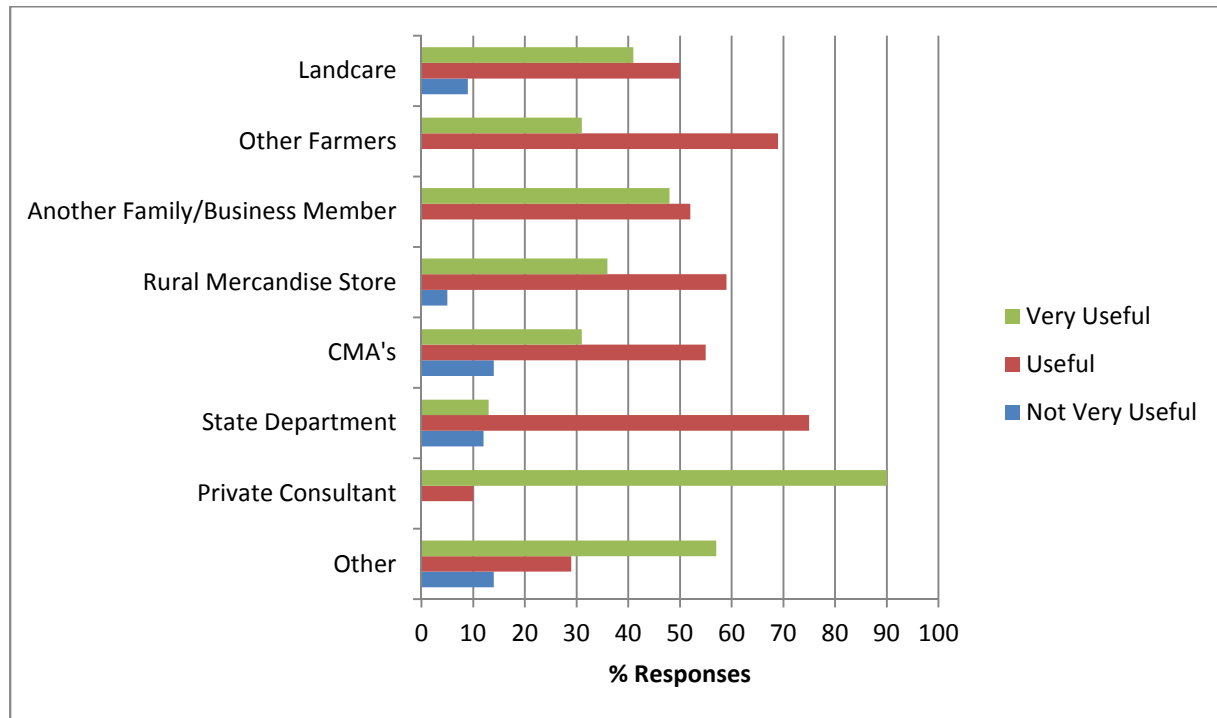


Figure 25. Usefulness of NRM information sources used by landholders

Landholders were also asked about the importance of their information sources for NRM information and advice. Over 85% of surveyed landholders ranked private consultants, CMA’s, family/business members, other farmers, and Landcare as important providers of this information. Other sources which were also listed as important included field days, workshops, own research and the internet.

The way that surveyed landholders use their information sources has changed over the last five years with an increase in the use of private consultants and other sources (internet, newspapers, other farming groups and organisations). All other sources were generally used as much or more than 5 years ago (figure 26).

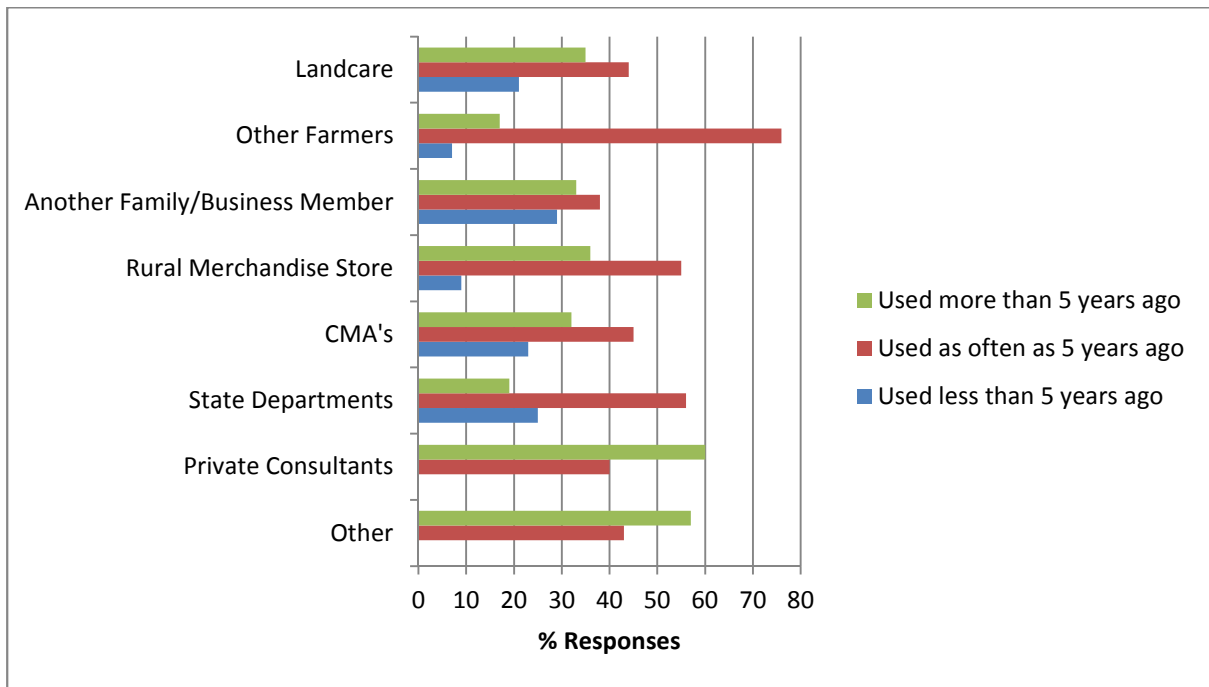


Figure 26. Change in usage of NRM information sources used by landholders

Whilst the majority of surveyed landholders had participated in NRM activities on their properties, only 31% said that they were current members of a Landcare group. Many of these landholders (60%) were previously Landcare members but the group no longer existed, whilst in other areas Landcare groups never existed (figure 27).

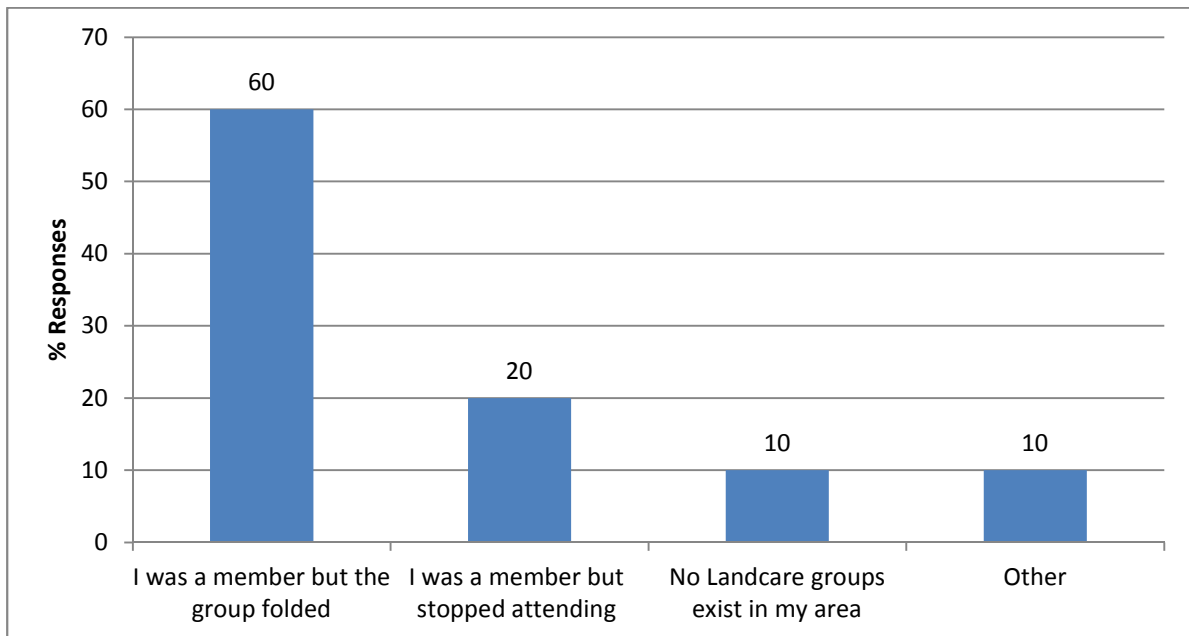


Figure 27. Reasons why landholders are not members of a Landcare group



For those landholders who are active members of Landcare, perceived benefits include access to funding, information and social engagement (figure 28).

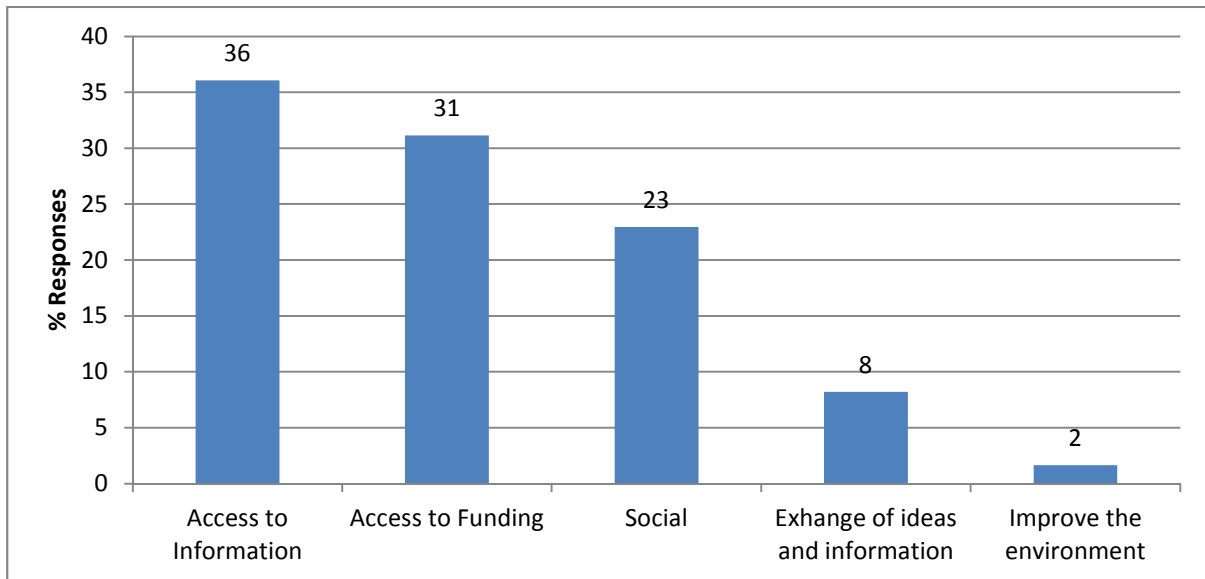


Figure 28. Perceived benefits of being a Landcare member

The importance of contributing to the community by landholders was illustrated by the number of landholders who are part of other groups including school (6%), show society (9%), sporting (31%) and the rural fire service (46%). Reason for the membership of these groups includes social, compulsory, information exchange, community involvement and inclusion (figure 29).

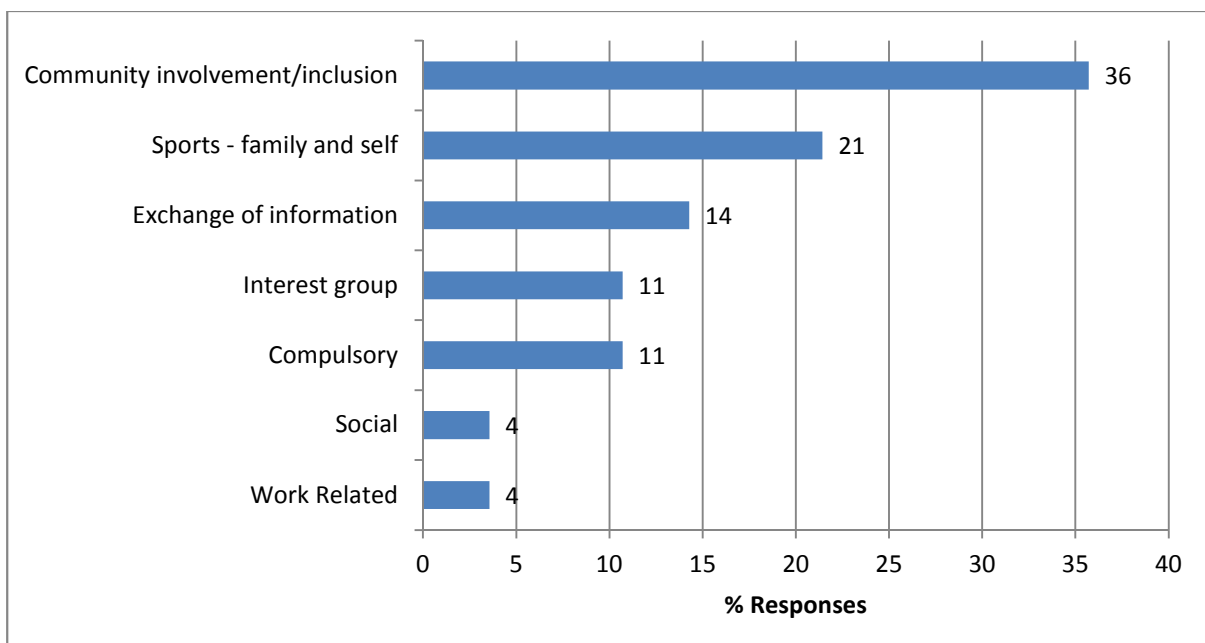


Figure 29. Reasons why landholders are members of other community groups and organisations

The amount of information being delivered to landholders is extensive and is provided in many different formats. Surveyed landholders were asked how they would like to receive NRM information. Over 50% of landholders preferred their NRM information to be delivered through newsletters, field days, ½ day workshops, farm visits, factsheets (hard copy), Landcare meetings and through fact sheets (electronic copy) (figure 30).

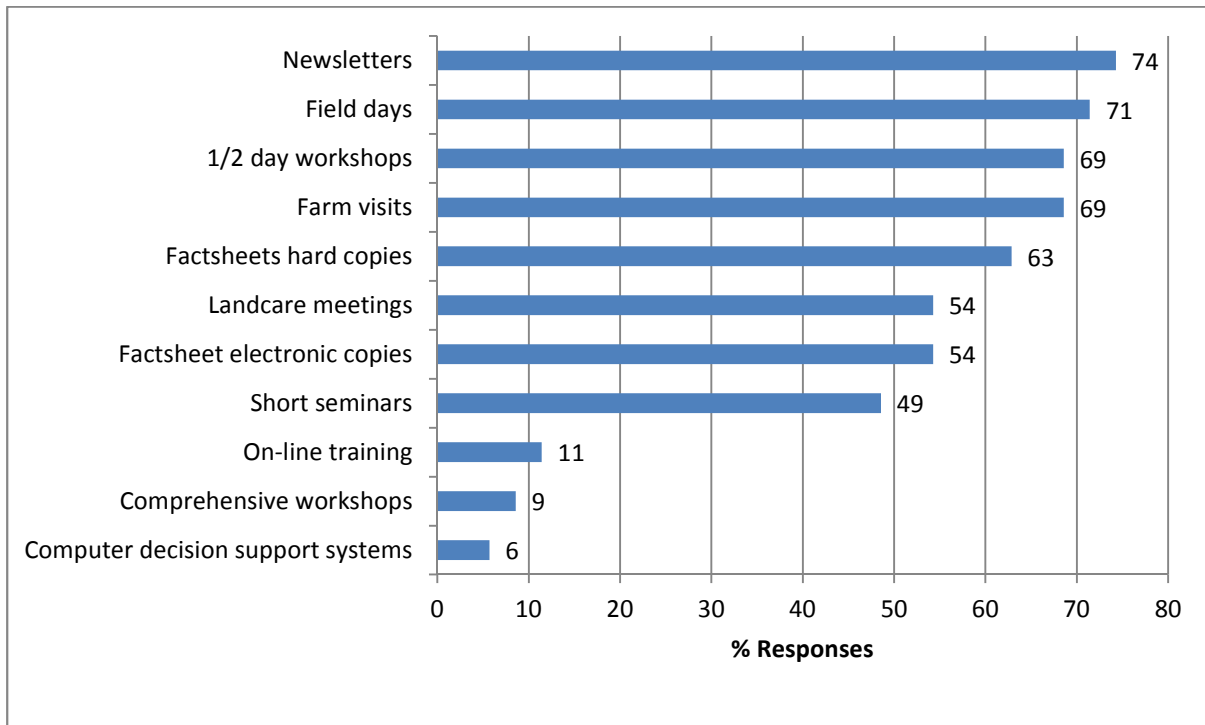


Figure 30. Ways that landholders like to receive NRM information

## Conclusion

Overall the survey results showed that landholders involved in the project are aware of the importance of native vegetation on their properties, and are keen to actively work to protect and enhance this vegetation, while maintaining the productivity of their properties.

Through the CPP project, Murrumbidgee Landcare will continue to work with landholders to expand their knowledge and understanding of the ways in which biodiversity conservation can be balanced with production, and to help enable landholders to implement changes to achieve this goal.

The feedback from landholders in terms of what is of relevance and value to them, and the ways in which they prefer to receive information, will be of great value in planning future project activities and ensuring that the information provided is accessible and useful to landholders.