Australian National University Sustainable Farms Project

Baseline Evaluation Report

August 2019

About this report and Sustainable Farms project

Aim of this report

To provide a baseline snapshot of farmers within the Sustainable Farms project area to allow the project to measure progress and ultimately the long-term impact of the initiative.

Objectives:

1. To establish a baseline regarding landholder knowledge and participation in natural asset management in the project region to be used in the evaluation of the Sustainable Farms Project
2. To develop a profile of landholders in the project region to inform the delivery of targeted Sustainable Farms Project activities

Accompanying documents

This report is closely aligned to the Sustainable Farms: An evaluation framework for measuring progress and assessing impact.

The Sustainable Farms Project

Project Mission:

To create a sustainable future for agriculture and farming communities

Sustainable Farms will deliver on this mission by:

- Promoting the adoption of sustainable farm management practices, primarily through the investment in natural assets on farms;
- Working in partnership with agencies and services to support natural resource management on farms;
- Undertaking transdisciplinary research; and
- Influencing higher education, government policy and industry.

Project Area:

SECTION 1: Baseline data on natural resource management on farms in Box Gum Grassy woodlands of South Eastern Australia

Objective 1: To establish a baseline regarding landholder knowledge and participation in natural asset management in the project region to be used in evaluation of the Sustainable Farms project.

Collecting baseline data provides the opportunity to assess engagement in natural asset management on farms in the Box Gum grassy woodlands and measure change over time.

This report will establish baseline data for the KPI's outlined in the Sustainable Farms (SF) Evaluation Framework utilising the Regional Wellbeing Survey data. Data will be provided for the SF Project Area, and for comparison purposes - the Box Gum Grassy Woodland area. Relevant KPI's are listed in Table 1 below.

Table 1: Sustainable Farms Evaluation Framework KPI's

FARMER NETWORK EXTENSION AND OUTREACH			
Outcome	**What is being measured?**	**Data source**	**Target**
1. Improved brand recognition of SF project	Percentage of farmers in the local government areas where demonstration farms are based, who are aware of the Sustainable Farms initiatives.	RWS 2018, 2020 & 2022	33% of farmers in the local government areas that demonstration farms are based.
2. Quality of SF extension services	Percentage of farmers in the local government areas where demonstration farms are based who report SF as a reputable source of advice on natural asset management	RWS 2018, 2020 & 2020	33% of farmers in the local government areas that demonstration farms are based.
3. Increased awareness of benefits of natural assets	Percentage of the farmers in the local government areas where demonstration farms are based, who score positively against an index designed to measure knowledge of the benefits of natural asset management.	RWS 2018 & 2020 2022	Increase of 30% of the farmers, who recall benefits of managing (i) increasing the areas of trees and shrubs, (ii) improving quality and quantity of groundcover, and (iii) excluding stock access to dams, rivers and streams.
4. Increased adoption of projects and practices	Percentage of farmers in the local government areas where demonstration farms are based, who have invested in natural asset management.	RWS 2018,2020 & 2022	>5% increase in number of farmers indicating they have invested in natural asset management.

In addition to the KPI's listed in the Sustainable Farms Evaluation Framework – this report will provide a baseline for the indicators relevant to the outcomes of the project outlined in Table 2.

Table 2: Additional Sustainable Farms Project KPI's

Outcome	What is being measured?	Deliverable
5. Increased inclusion of natural asset management in farm planning and objectives	Farm planning for natural asset management	Percentage of farmers who report planning for natural asset management as part of their farm planning.
	Farm management objectives which aim to improve natural assets on land	Percentage of farmers who agree farm management objectives which aim to improve natural assets on land are important

Methods:

About the Regional Wellbeing Survey

To establish baseline data for KPI's outlined in the Sustainable Farms (SF) Evaluation Framework, cross-sectional data from a sample of farmers who participated in the 2018 Regional Wellbeing Survey (RWS) is presented in this report. The RWS is an annual survey of people living in rural and regional Australia. The RWS collects data on a broad range of topics including farmer practices, rural life and resilience indicators (Schirmer et al., 2016). A detailed description of the methods used to collect data is provided in our 'Wellbeing, resilience, and liveability' report (Schirmer et al. 2016). This should be referred to for information about how the survey sampling is achieved and known limitations of the data set. The survey was open during September to November 2018, and participants were able to complete the survey in paper form or online. A total of 9,557 people participated in the RWS 2018. Of these, 2,228 participants were classified as farmers.

Sample

In this report, only farmers participating in the RWS 2018 were included in the sample. Participants were classified as a farmer if they indicated that they managed or assisted in the management of a farm, or that they did administration work for a farm business. A total of 2,228 farmers participated in the RWS in 2018, with 1,209 residing in LGA's within the Box-Gum Grassy Woodland area, and 390 residing in LGA's within the Sustainable Farms Project Area. Not all questions in the RWS were asked of all farmers, and some farmers did not respond to all questions they were asked. Data in this report will only include responses of those who were asked and completed the relevant question, and for this reason, sample sizes vary depending on the question being reported.

Data reported in this section will report on indicators of landholder knowledge and participation in natural asset management of survey respondents residing in the local government areas (LGA's) where the ANU Sustainable Farms Project activities are implemented (from this point referred to as the SF Project Area). In addition, this section will report on the same indicators for those farmers residing in LGA's in the Box Gum Grassy Woodland region for comparison.

A total of 390 farmers in the RWS 2018 resided in LGA's within the Sustainable Farms Project Area, and 1,209 farmers in the RWS 2018 resided in LGA's within the Box-Gum Grassy Woodlands region. A list of the local government areas in each of the regions can be found in Table 3 below.

Table 3: Local government areas within each reporting region

Sustainable Farms (SF) Project Area	
State/Territory	**LGA's within region**
NSW (n = 222)	Albury, Bathurst Regional, Berrigan, Blayney, Cabonne, Coolamon, Cootamundra-Gundagai Regional, Cowra, Federation, Forbes, Goulburn Mulwaree, Greater Hume, Hilltops, Junee, Lockhart, Murrumbidgee, Narrandera, Oberon, Orange, Parkes, Snowy Valleys, Temora, Upper Lachlan Shire, Wagga Wagga, Weddin, Yass Valley.
VIC (n = 168)	Alpine, Benalla, Greater Shepparton, Indigo, Mansfield, Moira, Strathbogie, Toowong, Wangaratta, Wodonga.

Box-Gum Grassy Area	
State/Territory (n)	**LGA's within region**
ACT (n = 3)	Australian Capital Territory
NSW (n = 547)	Albury, Armidale Regional, Bathurst Regional, Berrigan, Bland, Blayney, Blue Mountains, Bogan, Cabonne, Carrathool, Cessnock, Clarence Valley, Coolamon, Coonamble, Cootamundra-Gundagai Regional, Cowra, Dubbo Regional, Dungog, Edward River, Eurobodalla, Federation, Forbes, Gilgandra, Glen Innes Severn Shire, Goulburn Mulwaree, Greater Hume, Gunnedah, Gwydir, Hilltops, Inverell, Junee, Kempsey, Kyogle, Lachlan, Leeton, Lithgow, Liverpool Plains, Lockhart, Maitland, Mid-Coast, Mid-Western Regional, Moree Plains, Murray River, Murrumbidgee, Muswellbrook, Narrabri, Narrandera, Narroine, Oberon, Orange, Parkes, Queanbeyan-Palerang Regional, Shoalhaven, Singleton, Snowy Monaro Regional, Snowy Valleys, Tamworth Regional, Temora, Tenterfield, Upper Hunter, Upper Lachlan Shire, Urallla, Wagga Wagga, Walcha, Warrumbungle, Weddin, Wingecarribee, Wollondilly, Yass Valley.
VIC (n = 556)	Alpine, Ararat, Ballarat, Benalla, Boroondara, Buloke, Campaspe, Cardinia, Casey, Central Goldfields, Colac Otway, Corangamite, East Gippsland, Glenelg, Golden Plains, Greater Bendigo, Greater Geelong, Greater Shepparton, Hepburn, Hindmarsh, Horsham, Hume, Indigo, Latrobe, Loddon, Macedon Ranges, Mansfield, Melbourne, Melton, Mitchell, Moira, Moonee Valley, Moorabool, Moreland, Mount Alexander, Moyne, Murrindindi, Nillumbik, Northern Grampians, Pyrenees, Southern Grampians, Strathbogie, Surf Coast, Toowong, Wangaratta, Wellington, West Wimmera, Whittlesea, Wodonga, Yarriambiack.
QLD (n = 103)	Central Highlands Regional, Gold Coast City, Goondiwindi Regional, Gympie Regional, Ipswich City, Lockyer Valley Regional, Logan City, Maranoa Regional, Moreton Bay Regional, Scenic Rim Regional, South Burnett Regional, Southern Downs Regional, Toowoomba Regional, Western Downs Regional.

Outline of Section 1

Section 1 of the report will provide a baseline measure for each Sustainable Farms Project Outcome as outlined in Table 1 and Table 2.

For each outcome, Section 1 will provide:

a) An overview on why the objective is important.
b) How the objective was measured. In addition, a full list of the survey questions included in this report can be found in Appendix 1.
c) Overview of findings.
d) Benchmarks.
e) Limitations.
f) Tables of findings. Indicators for each outcome across the following regions, (i) the SF Box Gum Area, (ii) The SF Project Area. For Objective 1 (Sustainable Farms brand recognition), reporting will also include the level of awareness across the Local Land Service (LLS) and Catchment Management Authority Areas within the SF Project Area. This will help measure brand awareness across specific regions within the project area.

Outcome 1: Improved brand recognition

Why is this important?

With commencement of the ANU Sustainable Farms Project, brand recognition of the project among the target group (landholders and farmers across the project area) is essential for program implementation, and the achievement of the project objectives. The Sustainable Farms (SF) initiative provides direct outreach to farmers through the delivery of outreach services, with the aim of supporting farmers to sustain and enhance the natural assets on their land. In addition to the delivery of outreach services directly to farmers, the project aims to strengthen linkages between business, peak industry group, Landcare, Local Land Services (LLS) and relevant government agencies to increase the capacity of farmers to implement evidence-based practices to support biodiversity, carbon storage, farm business and farmer wellbeing.

How do we measure this?

In the 2018 RWS, participants were asked the following question

"Have you heard of the Sustainable Farms initiative being conducted by the Australian National University?

Response options included:

- Yes, I'm actively involved
- Yes, I've been involved I the past
- Yes, I've heard of it
- Not sure
- No

Those who answered either "Yes, I'm actively involved", "Yes, I've been involved in the past" or "Yes, I've heard of it" were included in the percentage of farmers who were aware of the project.

See appendix 1 for survey question

Findings:

Findings are provided in Table 4. There was little difference in the awareness and participation in the SF project across the Box Gum Area and the SF Project Area. The majority of survey participants across the SF project area were not aware of the project (55.8%), and 29.5% were aware of the project. The LLS with the highest percentage of survey participant awareness was Murray (34.8%), and the area with the lowest awareness was South East NSW (22.6%). Current participation in the project among survey participants within the SF Project Area is small (1.3%). Of the LLS's in the project area, Murray and Riverina reported the highest percentage of participation in the project (both 4.3%). Goulburn Broken, North East and South East NSW had no survey participants who were currently involved in the project. Awareness and participation of the SF project across LLS/CMA regions are consistent with the role out of the SF project in 2017/2018.

Benchmark

Percentage of farmers in the SF project area who are aware of the Sustainable Farms Initiative

Benchmark: 27.3%

TARGET: 33%

Limitations:

The numbers of survey participants in some LLS's are very small, results should be interpreted cautiously.

Table 4: Involvement of farmers in the SF project by Area

	Currently involved		Past involvement		Heard of the project		Aware of SF initiative*		Not sure		Not aware of project	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Box Gum Area	14	1.8%	11	1.4%	190	24.1%	215	27.3%	129	16.4%	444	56.3%
Sustainable Farms Project Area	4	1.6%	4	1.6%	68	26.4%	76	29.5%	38	14.7%	144	55.8%
Local Land Service/Catchment Management Authority Areas within SF Project Area												
Central Tablelands	1	2.2%	2	4.4%	8	17.8%	11	24.4%	6	13.3%	28	62.2%
Goulburn Broken	0	0.0%	2	2.8%	17	23.9%	19	26.8%	10	14.1%	42	59.2%
Murray	2	4.3%	0	0.0%	14	30.4%	16	34.8%	6	13.0%	24	52.2%
North East	0	0.0%	1	2.4%	11	26.8%	12	29.3%	8	19.5%	21	51.2%
Riverina	3	4.3%	0	0.0%	16	23.2%	19	27.5%	9	13.0%	41	59.4%
South East NSW	0	0.0%	0	0.0%	12	22.6%	12	22.6%	9	17.0%	32	60.4%

* Includes those who are either currently involved, involved in the past or have heard of the project

Outcome 2: Quality of Sustainable Farms extension services

Why is this important?

The role of extension services in supporting landholders to adopt natural asset management practices is well documented in the literature (Pannell et al. 2006), and the relationship between extension and adoption is determined by the quality of service offered to the farmers. For the delivery of extension services to lead to changes in land management practices, extension needs to be delivered in a way which the landholder believes to be reliable, creditable, legitimate and realistic. Quality extension services are those which are in line with the farmers goals for land management, and where farmers perceive the proposed changes will provide overall benefit to their farm enterprise. Central to the achievement of the Sustainable Farms project goals is the delivery of extension services to farmers in a manner which encourages, supports and ignites farmers willingness to adopt sustainable farming practices.

How do we measure this?

There are many sources of advice for natural asset management available to farmers. Those agencies which are perceived to be a valuable source of advice for natural asset management are considered to be an indicator of quality extension services (Pannell et al. 2006). As an indicator of the quality of the Sustainable Farms extension service, we measure the percentage of farmers reporting they would seek advice from Sustainable Farms (and other forms of extension) for the different types of natural asset management activities.

In the 2018 RWS, participants were asked which organisations they would seek advice from if they were to do the following natural asset management activities in the future:

1) Establishing trees or shrubs on your property (seeding, regenerating or planting)
2) Improving groundcover quantity or quality
3) Improving dam or river areas through restricting stock access (question asked only of those with livestock on their farm)

See appendix 1 for survey question

Findings:

Results are reported in Table 5.

For each source of advice, differences of more than 10% across the different types of natural asset management activities are highlighted in the table. Where the difference is 10% lower than other natural asset management activities, the value is highlight in **red**. Where the difference is 10% greater than other natural asset management activities, the value is highlighted in **green**.

Differences in sources of advice across the different natural asset management activities.

The extent to which farmers reported particular sources of advice varied depending on the type of natural asset management activity they would carry out. Those in the project area reporting that they wouldn't seek advice was relatively low for activities aiming to establish trees or shrubs (16.9%) and improving groundcover (16.0%). Comparatively, a much higher percentage of farmers reported they wouldn't seek advice for improving dam and river areas through restricting stock access (34.1%). Participants in the project area were much more likely to report Landcare as a source of advice for establishing trees or shrubs (58.1%) compared to the other types of natural asset management activities. Paying an expert to offer advice was more likely to be reported for improving groundcover (20.6%) compared to other activities. Overall, other farmers were considered to be a good source of advice across all natural asset activities, but was comparatively lower for improving dams and river areas (32.2%) when compared to establishing trees or shrubs (41.6%) and improving groundcover (48.5%).

Establishing trees or shrubs on your property.

Across the project area the most highly reported source of advice for establishing trees and shrubs was Landcare (58.1%), followed by other farmers (41.6%). The lowest source of advice was ANU field staff (3.7%), followed by a paid expert (5.2%). Only 16.9% of farmers reported they wouldn't seek advice for this natural asset management activity, suggesting that the majority of farmers in the project area would seek out advice of some sort.

Improving groundcover quantity or quality

Within the project area, the most reported source of advice for improving groundcover was other farmers (48.5%), followed by Landcare (35.1%). The lowest source of advice was again from the ANU Field staff, with only 4.6% of participants reporting this source. This was closely followed by Greening Australia (4.6%). Only 16% of participants in the project reported that they would not seek advice for this natural asset management activity, suggesting that the majority of farmers in the project area would seek out advice of some sort.

Improving dam or river areas through restricting stock access

As this activity is only relevant to farmers with stock, only those farmers who indicated they had livestock on their property were asked this question. Across the project area, the most common source of advice for improving dam and river areas through restricting stock access was Landcare (38.5%), closely followed by NRM agency (37.1%). Compared to other natural asset management activities, a higher percentage of farmers reported they would not seek advice for this activity (34.1%). The lowest source of advice was Greening Australia (2.9%). ANU Field staff were reported as source of advice for 4.9% of farmers in the project area.

Benchmark

Percentage of farmers who would seek advice from ANU field staff in establishing trees and shrubs **Benchmark: 3.7%** **Target: TBA**
Percentage of farmers who would seek advice from ANU field staff in improving groundcover quantity and quality **Benchmark: 4.6%** **Target: TBA**
Percentage of farmers who would seek advice from ANU field staff in improving dams and rivers by restricting stock access **Benchmark: 4.9%** **Target: TBA**

Limitations:

The numbers of survey participants reporting some sources of advice – including ANU Field staff is very small and should be interpreted cautiously. Additionally, it may be likely that those selecting 'wouldn't seek advice' could include some farmers who feel the natural asset management activity is not applicable to their farm or current situation (for example, those that do not have dam or river).

Table 5: Reported sources of advice for natural asset management activities

	Establishing trees or shrubs				Improving groundcover quantity or quality				Improving dam and rivers areas through restricting stock access*			
	Box Gum Area		Sustainable Farms Project Area		Box Gum Area		Sustainable Farms Project Area		Box Gum Area		Sustainable Farms Project Area	
Source of advice	***n***	***%***	***n***	***%***	***n***	***%***	***n***	***%***	***n***	***%***	***n***	***%***
Wouldn't	141	17.3%	45	16.9%	146	18.1%	42	16.0%	192	32.4%	70	**34.1%**
Landcare	438	53.8%	155	**58.1%**	267	33.1%	92	35.1%	191	32.3%	79	38.5%
NRM agency	313	38.5%	98	36.7%	275	34.1%	87	33.2%	226	38.2%	76	37.1%
An expert you paid	80	9.8%	14	5.2%	170	21.1%	54	**20.6%**	64	10.8%	22	10.7%
Greening Australia	63	7.7%	29	10.9%	34	4.2%	14	5.3%	18	3.0%	6	2.9%
ANU Field Staff	26	3.2%	10	3.7%	24	3.0%	12	4.6%	18	3.0%	10	4.9%
Other farmers	370	45.5%	111	41.6%	400	49.6%	127	48.5%	207	35.0%	66	**32.2%**
Others	70	8.6%	27	10.1%	72	8.9%	31	11.8%	21	3.5%	9	4.4%

NB: participants could select more than one source

** Sample includes only livestock and mixed crop-livestock farmers*

Outcome 3: Increased awareness of the benefits of natural assets

Why is this important?

A farmer's awareness and beliefs about the benefits of particular farming practices is an important predictor of whether or not a farmer will adopt such practices. The process of adopting sustainable farming practices is complex and dynamic, and there are many reasons why a farmer may not choose to adopt particular practices (Vanclay 2004), however beliefs about whether or not a sustainable farming will benefit a farmer both environmentally and financially is an important determining factor.

How do we measure this?

In the 2018 RWS, participants were asked about the extent to which they agreed or disagreed with statements about their perceived benefits of different farming activities which aim to improve natural assets. These activities included (i) increasing the area of trees and shrubs, (ii) improving the quality and quantity of groundcover and (iii) restricting stock access to dams and rivers. Results from all farmers in the relevant areas were included for the first two natural asset management activities, as these are considered to be activities relevant to all farming enterprises. Only those farmers who reported they were either livestock or mixed crop/livestock were reported for the third natural asset management activity – reducing stock access to dams and rivers - as this activity is only relevant to those with livestock.

A series of questions for each activity were asked, and results are included in Table 6. This table reports the percentage of farmers who are aware of the benefits against three measures for each activity. These measures include:

a) Awareness of the overall benefits of the activity. This measure was the mean score of questions asking about farmers agreement with statements about the perceived benefits of the natural asset management activity. Those who had a mean score of 5 to 7 on the 7 point scale were considered to be aware of the overall benefits of the natural asset management activity.
b) Agreement that the financial benefits of the natural asset management activity outweigh the costs. This was single item question asking farmers whether they agree or disagree that the financial benefits outweigh the costs.
c) Agreement that the environmental and other benefits of the natural asset management activity outweigh the costs. This was a single item question asking farmers whether they agree or disagree the environmental and other benefits outweigh the costs.

An outline of the questions asked can be found in Appendix 1

Findings:

Results are reported in Table 6

Awareness of the overall benefits of natural asset management activities.

Generally, there was a high level of awareness among those participants in the project area of the overall benefits of improving natural assets on farming land, particularly for activities which aimed to increase trees and shrubs (82.3%) and improve groundcover (83.8%). Those in the Sustainable Farms project area reported slightly higher levels of awareness compared to those in the Box Gum Area for activities which aimed to increase trees and shrubs and improve groundcover, but similar levels for restricting stock access. 62.7% of those surveyed in the project area were aware of the overall benefits associated with restricting stock access, lower compared to the other natural asset management activities.

Agreement that the financial benefits outweighed the costs

Compared to the other two measures of beliefs and attitudes about the benefits of natural asset management, a lower percentage of those farmers surveyed in the project area agreed that financial benefits outweighed the costs. Only 55.4% of farmers surveyed agreed that there was overall financial benefit in increasing trees and shrubs, lower compared to the measure of the overall benefits (82.3%), and environmental and other benefits (65.6%). Although slightly more farmers agreed that the financial benefits of improving groundcover outweighed the costs (60.2%), it was still lower than percentage who were aware of the overall benefits of improving groundcover (83.8%). Only 44.1%

of farmers surveyed in the project region agreed the financial benefits of restricting stock access to dams and rivers outweighed the costs, and this was lower compared improving groundcover and establishing trees and shrubs.

Agreement the environmental and other benefits outweigh the costs.

There were high levels of agreement that the environmental and other benefits of increasing trees and shrubs (65.6%) and improving groundcover (62.3%). This was higher compared to the percentage of surveyed farmers in the project region who agreed the environmental and other benefits outweigh the costs for restricting stock access to dams and rivers (41.5%).

Benchmark

Natural asset management activity	Awareness of the overall benefit of activity		Agree financial benefits outweigh the costs		Agree environmental and other benefits outweigh the costs	
	Benchmark	Target	Benchmark	Target	Benchmark	Target
Increasing the area of trees and shrubs on land	**82.3%**	>30% increase	**55.4%**	>30% increase	**65.6%**	>30% increase
Improving the quality and quantity of groundcover	**83.8%**	>30% increase	**60.2%**	>30% increase	**62.3%**	>30% increase
Restricting stock access to dams and rivers	**62.7%**	>30% increase	**44.1%**	>30% increase	**41.5%**	>30% increase

Limitations:

Although awareness about the benefits of natural asset management is an important predictor of adoption of sustainable farming practices, there are potentially many other reasons why farmers may not adopt new practices.

Table 6: Awareness and beliefs about the benefits of different natural asset management activities

		Box Gum Area		Sustainable Farms Project Area	
Awareness/belief	**NRM activity**	***n***	***%***	***n***	***%***
Aware of the overall benefits	Increasing trees and shrubs	602	78.1%	209	82.3%
	Improving groundcover	588	78.3%	207	83.8%
	Restricting stock access*	247	64.0%	84	**62.7%**
Agree financial benefits outweigh costs	Increasing trees and shrubs	366	48.0%	138	55.4%
	Improving groundcover	404	54.4%	148	60.2%
	Restricting stock access*	254	44.3%	89	**44.1%**
Agree enviro and other benefits outweigh costs	Increasing trees and shrubs	427	56.6%	162	65.6%
	Improving groundcover	422	57.5%	152	62.3%
	Restricting stock access*	154	40.1%	56	**41.5%**

* *Sample includes only livestock and mixed crop-livestock farmers*

Outcome 4: Increased adoption of projects and practices

Why is this important?

Participation in projects and practices that increase the natural assets on farm is fundamental to the achievement of the Sustainable Farms goals. Research from the long term ecological monitoring of the project region has indicated that participation in activities which aim to increase the areas of trees and shrubs, improve quality and quantity of groundcover, improve water quality in dams and rivers through restricting stock access and reduce pests and invasive weeds have important environmental and financial outcomes. Additionally, emerging research has highlighted the potential benefits participation in such practices can have on farmer wellbeing.

What we asked?

We asked survey participants about the types of NRM activities they had done on their land. A full list of the NRM activities included in the survey can be found in Appendix 1. As many of the NRM activities included in the survey are considered to be one-off actions (such as establishing new shelterbelts), of which are aimed to provide medium to long term benefits – we present the percentage of farmers in each area which have indicated they have ***ever*** done a particular NRM activity. Additionally, not all NRM activities listed are applicable to all farm types, and farmers were given the option to select N/A on this question. For the purpose of benchmarking, only those who answered 'yes' to the NRM action are presented in this report.

Findings:

Results can be found in Table 7, Table 8, Table 9 and Table 10 below. The most commonly reported NRM activity was reducing feral animal numbers, where 63.4% of farmers in the project region indicated they had done this activity. This was followed by establishing new shelterbelts (62.3%) and protecting paddock trees and remnant vegetation (58.8%). The least reported NRM activity involving tree or shrub planting was planting around rivers, where 28.7% of farmers in the project region indicated they had done this in the past. It is likely that comparably low percentage of this activity may be attributed to the fact this activity is only relevant to farmers who have rivers on their property. The most commonly reported NRM activity related to groundcover was 'improving groundcover', where over half (51.3%) of farmers had indicated they had done this. This was closely followed by increasing deep-rooted perennial grasses where 46.9% of participants in the project area indicated they had done this. The lowest groundcover activity was increasing native pastures by replacing exotic pastures, whereby only 12.0% had ever done this. For activities aimed at improving water quality, the most commonly reported practice was installing watering points, where 41.0% of participants in the SF project area indicated they had done this. Installing hardened access points to dams was the least reported activity, with only 6.4% of participants indicating they had done this. One possible explanation for the lower participation rate of this NRM activity is that this activity is only relevant to those farmers with livestock and dams.

Benchmark

	BENCHMARK	TARGET
Establish new shelter belt with natives	62.3%	>5% increase
Improve existing shelter belt with natives	45.7%	>5% increase
Protected paddock trees or remnant veg	58.8%	>5% increase
Planted/regen veg around dam	31.6%	>5% increase
Planted/regen veg around river	28.7%	>5% increase
Planted/regen veg in other area	48.1%	>5% increase
Increased deep-rooted perennial grasses	46.9%	>5% increase
Increased native pastures by replaces exotic pasture	12.0%	>5% increase
Improved groundcover (increasing % of groundcover)	51.3%	>5% increase
Reduced amount of inorganic fertiliser to produce same yield	26.9%	>5% increase
Slow the flow of rivers/streams	21.8%	>5% increase
Slow the flow of overland water	36.9%	>5% increase
Exclude stock access to dams	30.1%	>5% increase
Exclude stock access to rivers/streams	28.4%	>5% increase
Installed hardened access points	6.4%	>5% increase
Installed watering points	41.0%	>5% increase
Reduce feral animals	63.4%	>5% increase
Reduce invasive weeds	49.3%	>5% increase

Limitations:

Not all NRM activities are relevant to all farmers, so for a portion of farmers who were asked this question, non-participation may indicate the irrelevance of the activity, rather than non-participation. Planting around rivers is an example of this, where this activity is only relevant for those with river banks on their property.

Table 7: Participation in practices to increase the area of trees and shrubs on land

	Box Gum Area		SF Project Area	
	n	***%***	***n***	***%***
Establish new shelter belt with natives	598	53.8%	221	62.3%
Improve existing shelter belt with natives	406	37.5%	156	45.7%
Protected paddock trees or remnant veg	568	51.6%	204	58.8%
Planted/regen veg around dam	277	25.4%	110	31.6%
Planted/regen veg around river	270	24.8%	100	28.7%
Planted/regen veg in other area	414	38.1%	168	48.1%

Table 8: Participation in NRM practices to improve the quality and quantity of groundcover

	Box Gum Area		SF Project Area	
	n	*%*	*n*	*%*
Increased deep-rooted perennial grasses	434	39.9%	161	46.9%
Increased native pastures by replaces exotic pasture	118	11.0%	41	12.0%
Improved groundcover (increasing % of groundcover)	493	45.9%	176	51.3%
Reduced amount of inorganic fertiliser to produce same yield	257	23.7%	93	26.9%

Table 9: Participation in NRM practices to improve waterways

	Box Gum Area		SF Project Area	
	n	*%*	*n*	*%*
Slow the flow of rivers/streams	234	21.6%	75	21.8%
Slow the flow of overland water	397	36.3%	129	36.9%
Exclude stock access to dams	336	30.7%	106	30.1%
Exclude stock access to rivers/streams	305	27.9%	99	28.4%
Installed hardened access points	83	7.7%	22	6.4%
Installed watering points	460	41.9%	143	41.0%

Table 10: Participation in pest and weed control

	Box Gum Area		SF Project Area	
	n	*%*	*n*	*%*
Reduce feral animals	719	65.1%	223	63.4%
Reduce invasive weeds	552	50.3%	172	49.3%

Outcome 5. Increased inclusion of natural asset management in farm planning and objectives

Why is this important?

Inclusion of natural asset management in farm planning and objectives is indicative of not just a farmer's intention to participate in sustainable farming activities, but also suggests farmers value the importance such activities in the overall management of their farming business.

What we asked?

In the RWS 2018, farmers were asked about the extent to which they agreed or disagreed that their farm planning included the following:

- A plan in place for the next drought
- A plan for natural resource management objectives e.g. soil health, maintaining water quality, vegetation management

The percentage of farmers in each area which agree with the statements provided (scored between 5-7) are reported in Table 11.

Additionally, farmers were asked about how important the following objectives related to natural asset management were to their farm management:

- Maintaining good groundcover
- Ensuring high nutritional value of groundcover
- Minimising the volume of inputs used on my farm e.g. fertilizer
- Matching production levels to soil and pasture capacity
- Increasing the organic matter in my soil
- Increasing the diversity of plants and organisms on my land
- Monitoring whether NRM/environmental objectives are being achieved on the farm, e.g. through photos or documenting change

The percentage of farmers in each area who rated the above objectives as important (scored between 5-7) are also reported in Table 11

Findings:

Over half of the farmers surveyed in the SF project region had a plan for the next drought (59.9%), and also had a plan that included NRM objectives (63.0%). Additionally, the majority (>80%) of surveyed farmers in the project area reported that they felt natural asset objectives related to improving soil and groundcover were important, while a lower portion (60.7%) of farmers felt minimising the volume of farm inputs was an important farm objective. Nearly three-quarters (73.6%) of those surveyed in the project area felt improving biodiversity was also an important farm objective. Despite the majority of surveyed farmers finding these particular NRM activities important, only 42.0% thought that monitoring the achievement of NRM objectives was an important objective of farm management.

Benchmark:

These indicators were not included in the SF Evaluation Report as set benchmarks – however they may be used in the future to monitor the extent to which farmers are incorporating natural asset management into farm planning and objectives.

Limitations:

These measures are farmers self-reporting their farm objectives and farm planning activities – and does measure the extent to which reported farm planning and objectives translate into farm management practices.

Table 11: Percentage and number of farmers who agree with the following statements about farm planning and objectives

	Box Gum Area		Sustainable Farms Project Area	
	n	*%*	*n*	*%*
We have a plan for….				
the next drought	662	58.9%	214	59.9%
NRM objectives	647	58.0%	225	63.0%
The following objectives are important to my farm management				
Maintaining good groundcover	1021	87.8%	338	89.2%
Ensuring high nutritional value of groundcover	939	81.7%	309	82.2%
Minimising the volume of farm inputs	703	61.3%	229	60.7%
Matching production levels to soil/pasture	925	81.6%	312	84.1%
Increasing the organic matter in my soil	938	82.4%	306	82.3%
Increasing biodiversity	792	69.8%	273	73.6%
Monitoring NRM/environmental objectives	426	37.8%	155	42.0%

Section 2: Demographic Profile of Farmers in the Sustainable Farms Project Area

To develop a profile of landholders in the project region to inform the delivery of targeted Sustainable Farms Project activities

Methods:

Data reported in this section has been drawn from two sources:

1) The Regional Wellbeing Survey 2018
2) The ABS Census of Population and Housing Data 2016

Defining farmers

This report presents information about farmers in the SF Project Area. There are some differences in how a farmer is defined according to the ABS Census data, and in the RWS 2018 survey. In the Census, a person is only able to record a single occupation, and they are defined as a farmer if they select this as their single occupation. This means that if a person works off the farm as well as being a farmer, they are only recorded as a farmer if they wrote farming as their primary occupation.

In the RWS 2018, a participant is defined as a farmer or farm manager based on several screening questions asking about their involvement in managing a farm. This included asking if they:

- Were a farmer
- Owned or part-owned a farm business
- Managed or co-managed a farm business
- Do administration work (e.g. the books) for a farm business

By defining farmers this way, the RWS is able to identify farmers who may not define or identify themselves as farmers.

Sample size

According to the ABS Census data – there are 10,889 farmers in the SF Project Area in 2016.

In the 2018 RWS survey, 386 farmers from the project region completed the survey (although not all these farmers were asked all survey questions).

Outline of Section 2

The purpose of Section 3 of this report is provide a profile of farmers in the SF project region to help target SF project activities in the future. This section of the report will answer the questions outlined in Table 12 below.

Table 12: Section 2 reporting questions

Question	Measures	Data Source	Sample
1. What are the demographic characteristics of farmers in the SF Project Area?	Gender Age Education level	RWS 2018 ABS Census 2016	Report findings from the following groups: Those residing in NSW LGAs within the SF project area. Those residing in VIC LGAs within the SF project area. Those residing in LGAs within the entire SF project area
2. What are the farm characteristics of farmers in the SF Project Area?	Farm type Farm size (in hectares) Farm size (Gross Value Agricultural Product) Years in farming Proportion of income earnt off-farm	RWS 2018 ABS Census 2016	Report findings from the following groups: Those residing in NSW LGAs within the SF project area. Those residing in VIC LGAs within the SF project area. Those residing in LGAs within the entire SF project area
3. What are the demographic characteristics of those farmers who do and do not seek advice for natural asset management?	Gender Age Education level	RWS 2018	Those residing in LGAs within the entire SF project area
4. What are the farming characteristics of those farmers who do and do not seek advice for natural asset management?	Farm type Farm size (in hectares) Farm size (Gross Value Agricultural Product) Years in farming Proportion of income earnt off-farm	RWS 2018	Those residing in LGAs within the entire SF project area
5. What are the demographic characteristics of those who have participated in NRM activities compare to those farmers who don't?	Gender Age Education level	RWS 2018	Those residing in LGAs within the entire SF project area
6. What are the farming characteristics of those who have participated in NRM activities compare to those farmers who don't?	Farm type Farm size (in hectares) Farm size (Gross Value Agricultural Product) Years in farming Proportion of income earnt off-farm	RWS 2018	Those residing in LGAs within the entire SF project area

Question 1: What are the demographic characteristics of farmers in the Sustainable Farms Project Area?

Findings:

Data from both the ABS and RWS were analysed to describe the demographic characteristics of farmers in the SF project area. Gender, age and educational attainment were examined. Results are displayed in graphs 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 and 1.7.

Farmers in the Sustainable Farms Project Area were:

More likely to be male compared to female

Were older, with most aged between 40 to 69 years of age

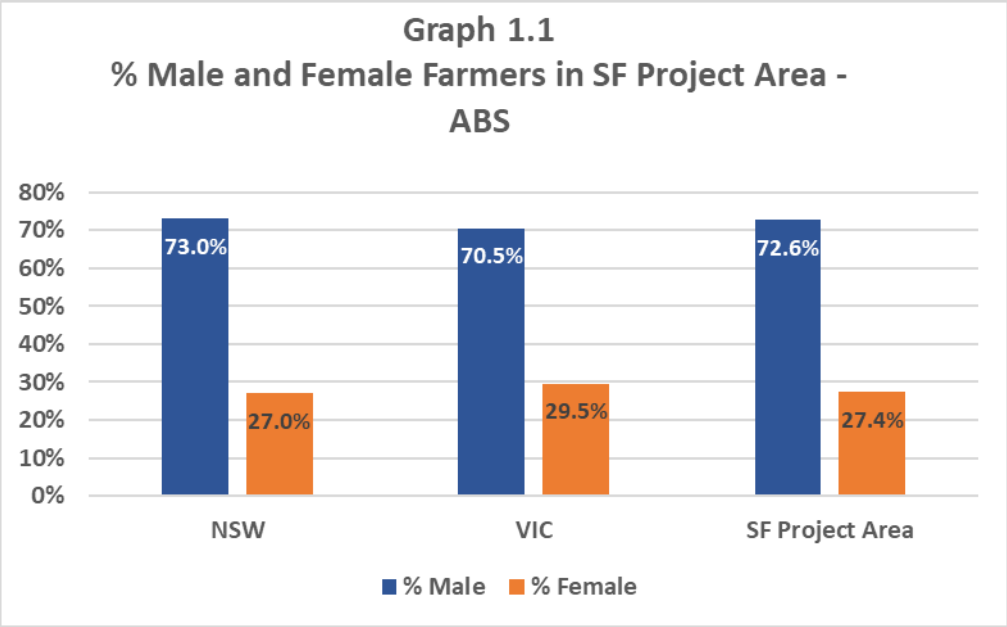
Less than half had completed year 12, although just over half had some form of post-school qualification

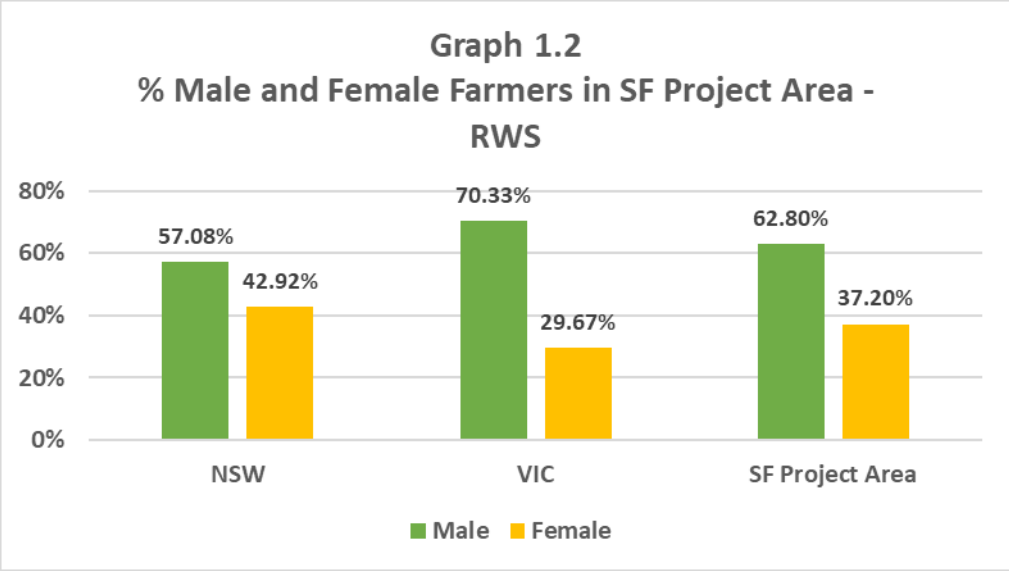
Gender

Of survey participants living the project region, there was a higher percentage of males compared to females from both the RWS 2018 and the ABS 2016 datasets. There are some differences between the RWS data and the ABS data. The RWS data has a higher proportion of female survey participants across the entire project region, and among those in the project region from NSW.

There are several possibly explanations for this. Firstly, generally speaking women are more likely to respond to requests for survey's and are often oversampled – and RWS is no exception.

Secondly, there are differences in how both RWS and ABS define a farmer. In the ABS survey, farmers are defined only as a farmer if they select farming as their first occupation. For many farming women, they may work off-farm, and therefore may not be classified in this occupation. For the RWS, participants self-identify as farmers if they select that they either manage, assist in the management, or do admin for a farm.

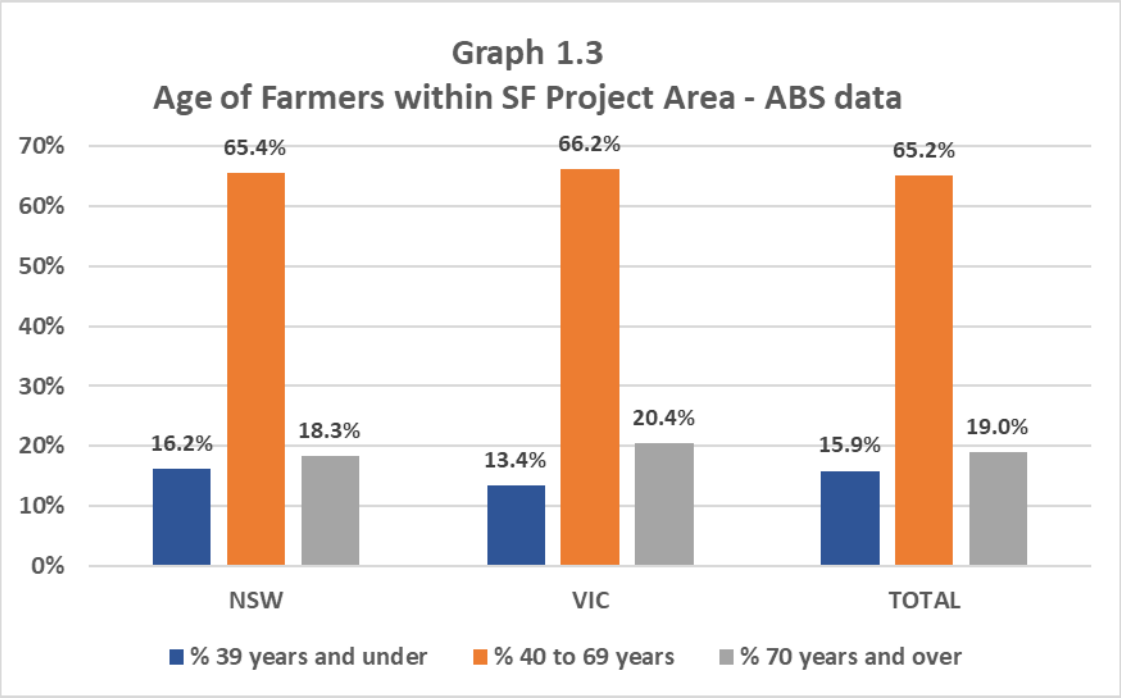


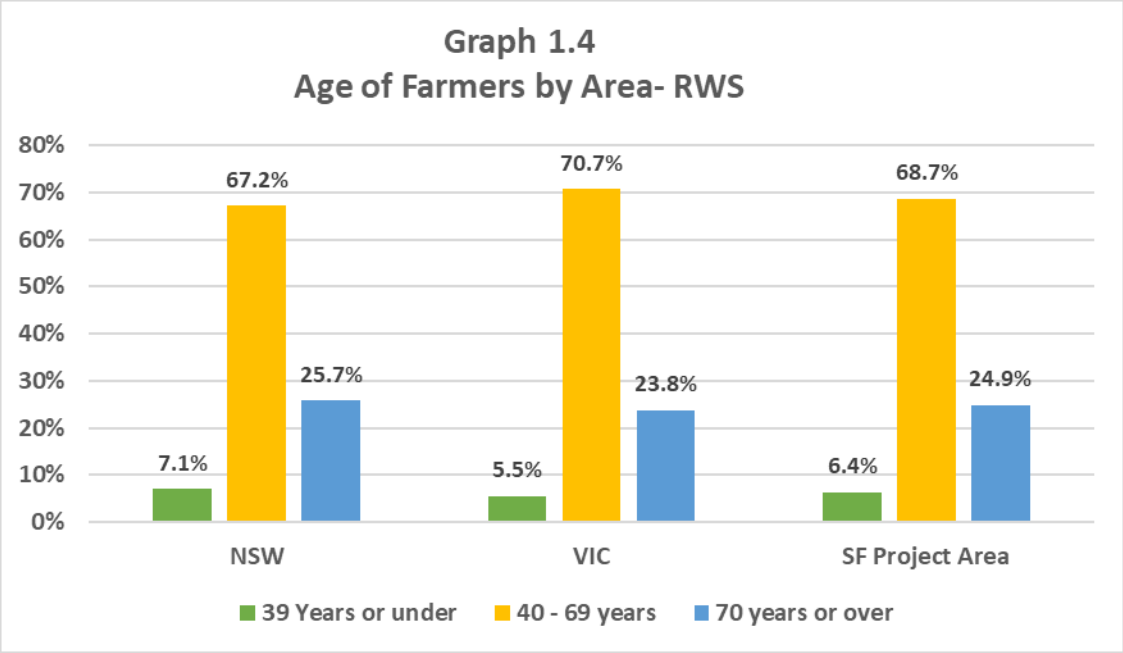


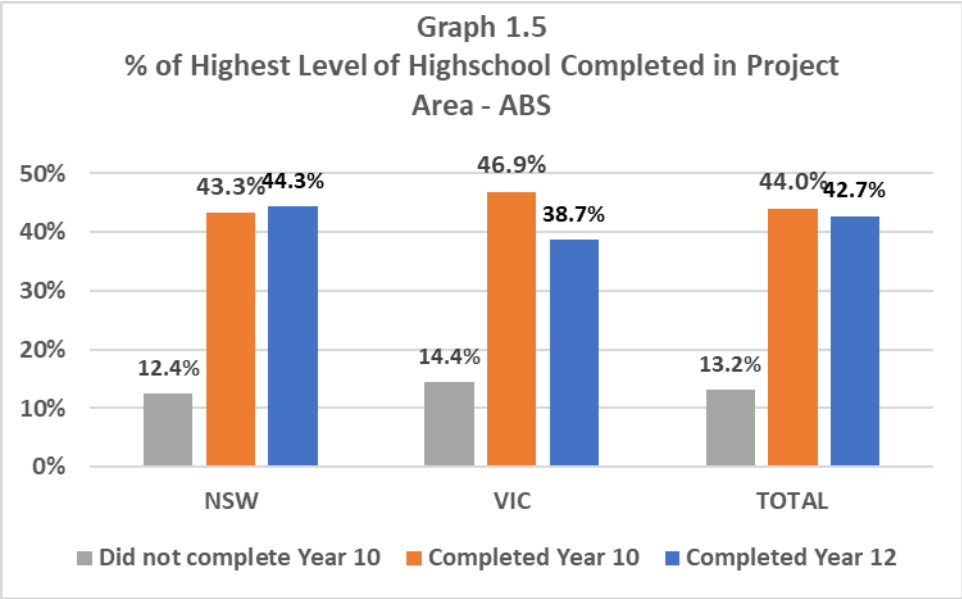
Age

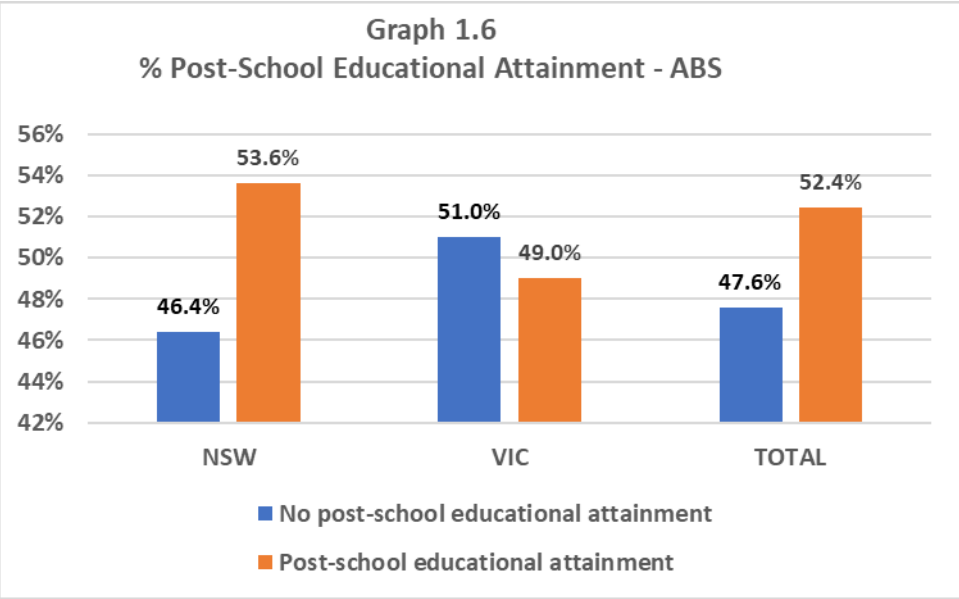
Both the data from the ABS and the RWS show the majority of farmers in the project region are over the age of 40, with the highest proportion of farmers in the group aged 40 to 69 years of age. There are some difference between the two data sets. Namely, the proportion of farmers in the two older age categories are higher in the RWS 2018 data set compared to the ABS data. Additionally, the proportion of farmers under the age of 39 is lower in the RWS data set compared to the ABS data.

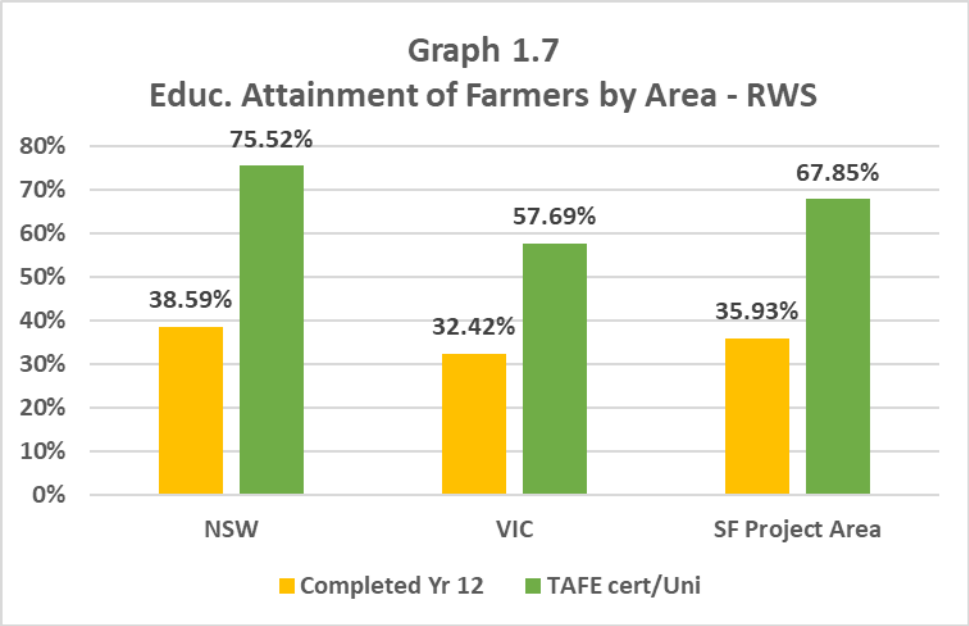
The most likely explanation for such a difference is that older age groups are more likely to participate in surveys such as the RWS survey – and are therefore over-represented in survey data











Education

Generally speaking, patterns of educational attainment across the SF project were similar in both the ABS and RWS 2018 data sets with some slight differences. Data from the ABS found a slightly higher proportion of the sample as completed year 12 (42.7%), while data from the RWS 2018 found 35.9% of the sample as completed year 12. There may be some differences in the education level across farmers in the project area living in NSW and VIC with both the RWS 2018 and the ABS surveys finding those in NSW had a slightly higher proportion who had completed year 12 compared to VIC.

The way in which in post-school educational attainment was measured differed across the two datasets, so cannot be properly compared. The ABS data report a total of 52.4% of farmers in the region had obtained a post-school qualification. The RWS 2018 found that 67.9% of farmers in the project area had obtained either a TAFE certificate or university degree.

Question 2: What are the farm characteristics of farmers in the Sustainable Farms Project Area?

Findings:

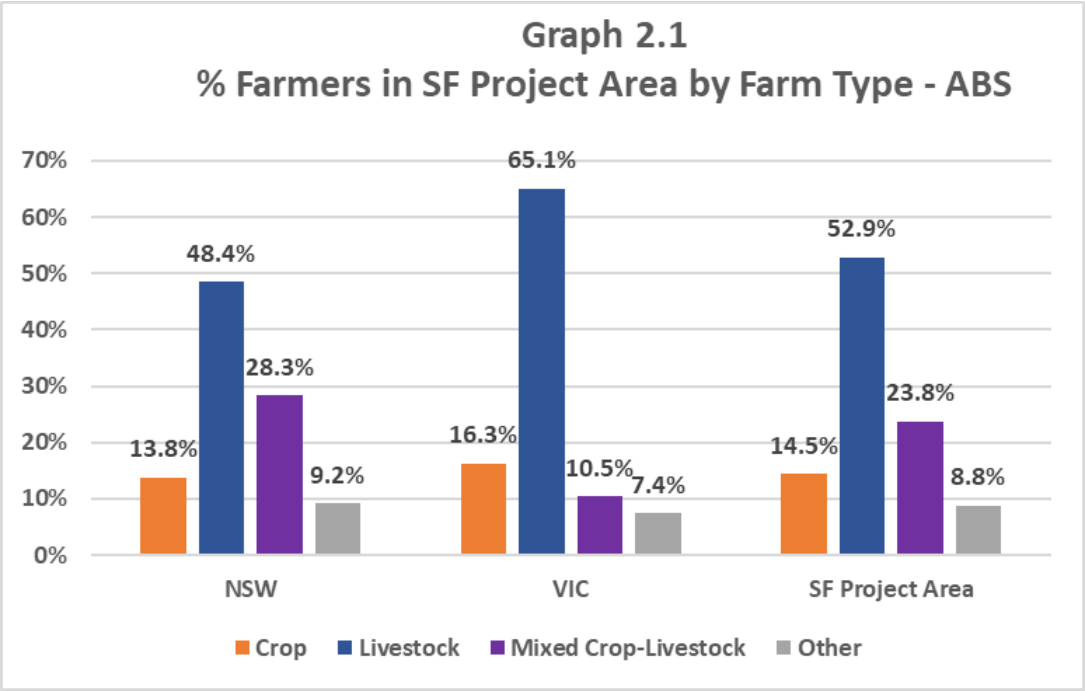
Data from both the ABS and RWS 2018 were examined to described the farm characteristics of farmers in the Sustainable Farms Project Area. We looked at farm type, farm size (hectares and Gross Value Agricultural Product),

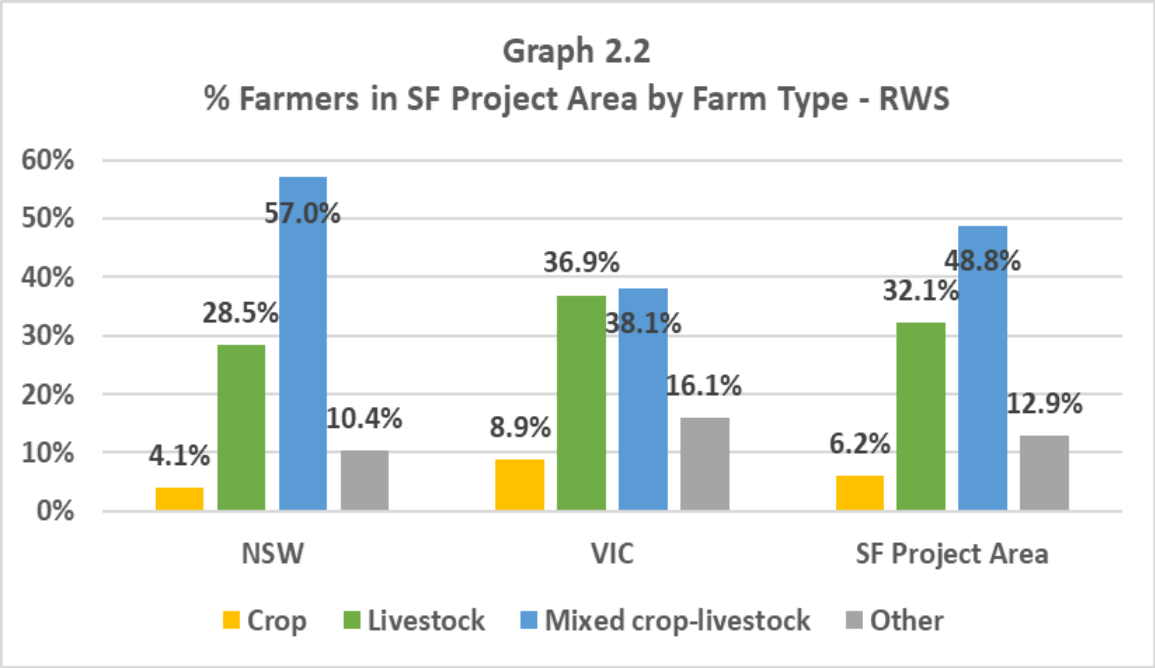
Farm characteristics of the farmers in the Sustainable Farms Project Area are:

- Most have some form of livestock as part of their farming enterprise (ABS and RWS).
- Over half the farming properties were less than 300 hectares in size (RWS 2018).
- About one-third of farmers participating in the RWS survey from the project region have a GVAP of less than $40,000 per annum.
- Over half of RWS participants have been farming for more than 30 years.
- Just under half of farmers from the project region participating in the RWS got less than 30% of their income from off-farm sources.

Farm Type

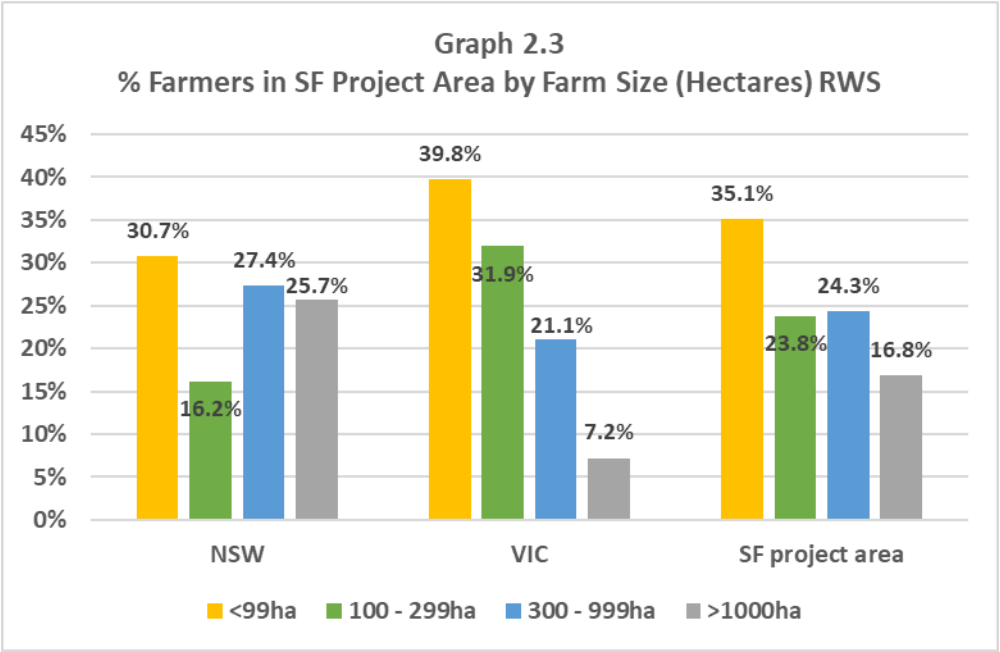
The percentage of farmers by farm type across the two data sets differed. Firstly, the percentage of croppers across the project area participating in the RWS was lower than percentage from the ABS data (6.2% compared to 14.5%). The percentage of farmers in the project area surveyed in the RWS who were classified as livestock was also lower compared to ABS data (32.1% compared to 52.9%), while the percentage of farmers classified as mixed crop-livestock was higher in the RWS (48.8%) compared to the ABS dataset (23.8%). These differences may be partially explained by differences in how the two data sets have classified farm type. In the RWS survey, farmers are asked about all their farm business activities, and those who report they do both cropping and livestock – are classified as mixed crop-livestock – even when one farm activity is considered minor. This may result in a higher percentage of RWS participants being classified as mixed crop-livestock, and a lower percentage of participants being classified as either crop only or livestock only.





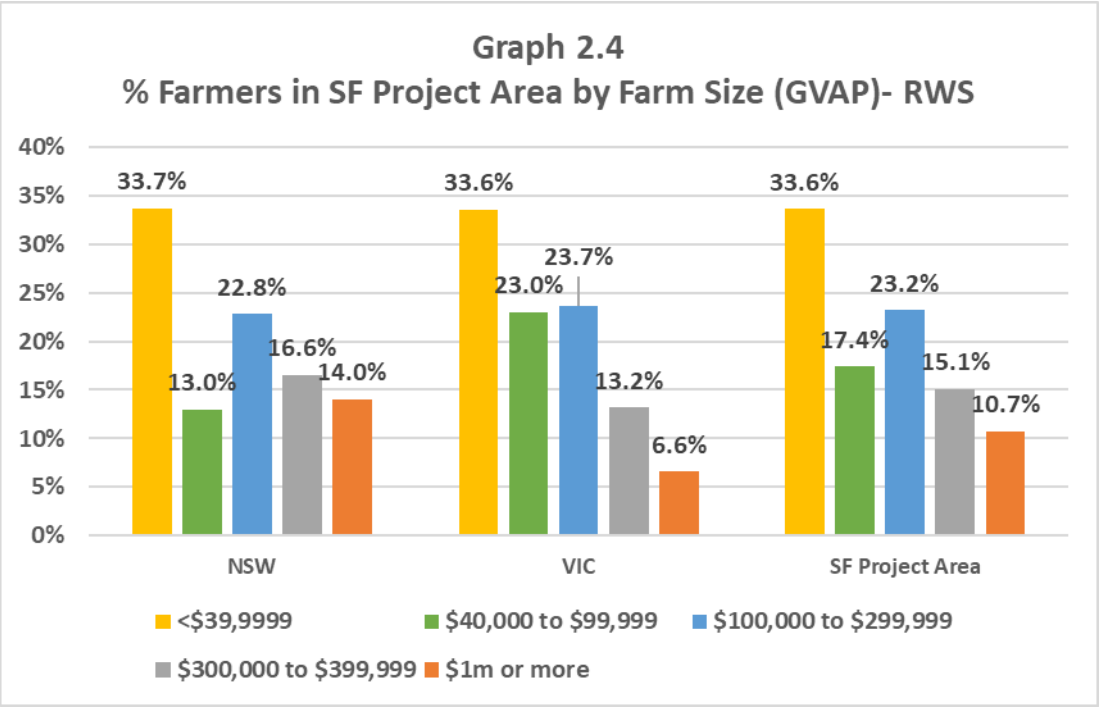
Farm size (hectares)

Data from the RWS 2018 only is presented in this report. There are some differences in the farm size across landholders in the project region from NSW and VIC. VIC had a slightly higher percentage of farmers with a farm size of less than 299ha, and NSW had a higher percentage of farmers with a farm size greater than 1000ha.



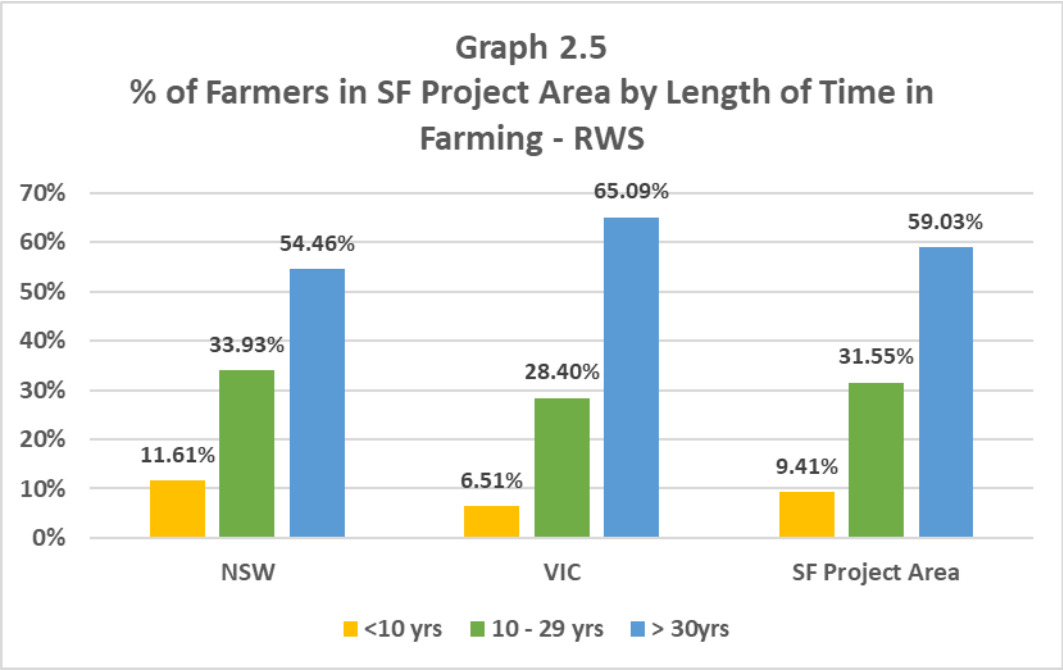
Farm size (GVAP)

Only data from the RWS 2018 is included in this report. Of those farmers surveyed, approximately one-third had a GVAP of less than $39,9999. There were some differences in the GVAP of farmers from the NSW areas of the project region, compared to those in the VIC areas of the project region. NSW had a higher proportion of farmers with a GVAP of $100,000 or more (53.4%), compared to VIC (43.5%).



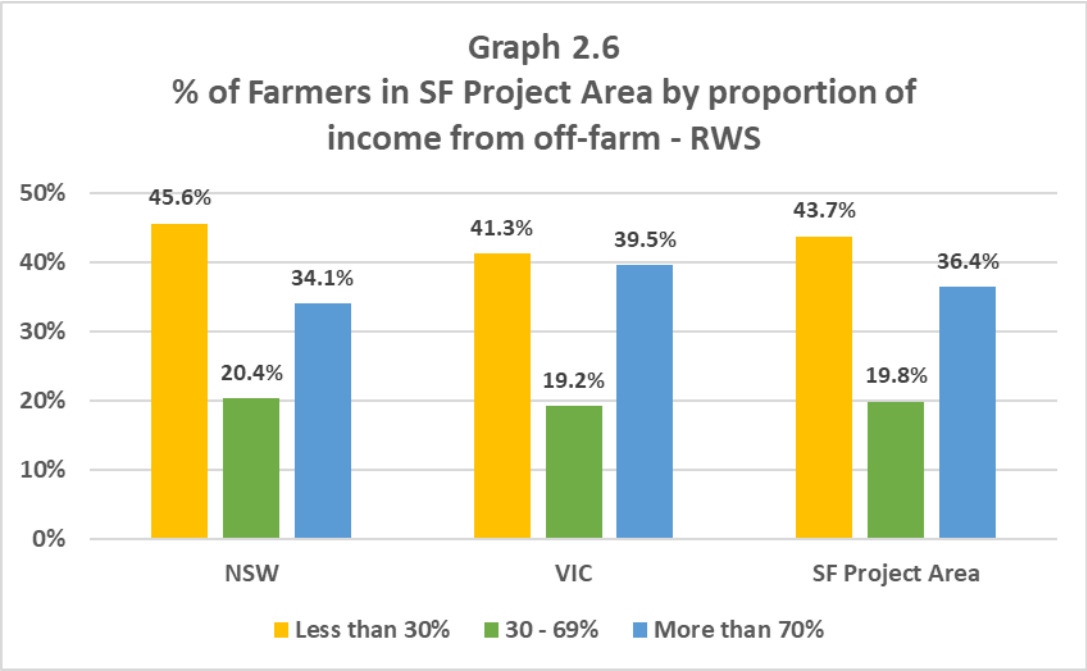
Length of time in farming

Only data from the RWS 2018 is reported for length of time in farming. There were similar patterns across the Victorian and NSW areas of the project region, where the majority of farmers surveyed had been farming for more than 30 years, although VIC had a higher percentage compared to NSW. NSW had a slighter higher percentage of farmers who had been farming for less than 30 years (45.5%), compared to VIC (35.9%).



Proportion of income from off-farm sources

Only data from the RWS 2018 is reported for proportion of income from off-farm sources. Overall, nearly half of all farmers in the project region got the majority of their income from the farm. Patterns were similar across the NSW and VIC areas of the project region; however VIC had a slightly higher percentage of farmers reporting they had more than 70% of their total income coming from off-farm sources.



Question 3: What are the demographic characteristics of those farmers who do and do not seek advice for natural asset management?

Using the RWS 2018 survey data, we looked at the age, gender and educational characteristics of farmers in the SF project area based the sources of advice they seek for natural asset management. Findings are reported in Table 13.

Findings:

When compared to those who would seek advice from agencies and professional, those farmers who wouldn't seek advice were more likely to:

- Be male
- Not have a university degree or TAFE certificate

There appeared to be no difference in age of those who would seek advice from agencies and professionals compared to those who wouldn't seek advice.

Table 13: Age, gender and educational attainment of farmers who access the different sources of advice for NRM activities

		Female		Male		< 39 years of age		40 to 69 years of age		Over 70 years of age		Completed Yr 12 highschool		University or TAFE cert	
		n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
For establishing trees and shrubs on property	Wouldn't seek advice	10	22.7%	34	77.3%	3	6.7%	28	62.2%	14	31.1%	15	33.3%	24	53.3%
	Other farmers	47	42.7%	63	57.3%	9	8.1%	82	73.9%	20	18.0%	46	41.4%	84	75.7%
	Agencies or professionals	81	42.2%	111	57.8%	15	7.8%	135	69.9%	43	22.3%	69	35.8%	154	79.8%
For improving groundcover	Wouldn't seek advice	10	24.4%	31	75.6%	3	7.1%	28	66.7%	11	26.2%	13	31.0%	24	57.1%
	Other farmers	57	45.2%	69	54.8%	9	7.1%	92	72.4%	26	20.5%	47	37.0%	96	75.6%
	Agencies or professionals	68	41.5%	96	58.5%	12	7.3%	113	68.5%	40	24.2%	60	36.4%	130	78.8%
For improving dam and river areas through restricting stock access	Wouldn't seek advice	27	30.0%	63	70.0%	4	4.4%	66	72.5%	21	23.1%	30	33.0%	60	65.9%
	Other farmers	39	49.4%	40	50.6%	10	12.5%	53	66.3%	17	21.3%	39	48.8%	56	70.0%
	Agencies or professionals	55	40.7%	80	59.3%	11	8.1%	93	68.4%	32	23.5%	51	37.5%	108	79.4%

Question 4: What are the farming characteristics of those farmers who do not seek advice for natural asset management compared to those farmers who do?

Using the RWS 2018 survey data, we looked at the farm type, farm size (GVAP and hectares), length of time in farming and proportion of off-farm income of those farmers in the SF project area based the sources of advice they seek for natural asset management. Findings are reported in Table 14, Table 15 and Table 16.

Findings:

When compared to those who would seek advice from agencies and professional, those farmers who wouldn't seek advice were more likely to:

- Have some form of cropping as part of the farm enterprise.
- Been farming for a long time (over 30 years).
- Have a lower percentage of income from off-farm sources.

There appeared to be no difference in the farm size (measured using GVAP and hectares) of those who would seek advice from agencies and professionals compared to those who wouldn't seek advice.

Table 14: Farm type and size of farmers who access the different sources of advice for NRM activities

		Farm Type								Farm size (Gross Value Agricultural Product)									
		Crop		Livestock		Mixed crop-livestock		Other		< $39,999		$40,000 to $99,999		$100,000 to $299,999		$300,000 to $999,999		$1m or more	
		n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	n	%	*n*	*%*	*n*	*%*	*n*	*%*
For establishing trees and shrubs on property	Wouldn't seek advice	3	6.8%	9	20.5%	25	56.8%	7	15.9%	17	38.6%	3	6.8%	10	22.7%	5	11.4%	9	20.5%
	Other farmers	7	6.4%	38	34.9%	55	50.5%	9	8.3%	30	30.3%	19	19.2%	22	22.2%	17	17.2%	11	11.1%
	Agencies or professionals	8	4.2%	67	34.9%	97	50.5%	20	10.4%	61	35.3%	34	19.7%	34	19.7%	28	16.2%	16	9.2%
For improving groundcover	Wouldn't seek advice	4	9.8%	10	24.4%	19	46.3%	8	19.5%	16	41.0%	2	5.1%	9	23.1%	5	12.8%	7	17.9%
	Other farmers	8	6.5%	36	29.0%	70	56.5%	10	8.1%	36	31.6%	25	21.9%	20	17.5%	25	21.9%	8	7.0%
	Agencies or professionals	5	3.0%	59	35.8%	82	49.7%	19	11.5%	50	33.6%	28	18.8%	34	22.8%	21	14.1%	16	10.7%
For improving dam and river areas through restricting stock access	Wouldn't seek advice	5	5.6%	23	25.6%	47	52.2%	15	16.7%	30	34.5%	12	13.8%	20	23.0%	14	16.1%	11	12.6%
	Other farmers	5	6.5%	30	39.0%	36	46.8%	6	7.8%	24	35.8%	12	17.9%	15	22.4%	12	17.9%	4	6.0%
	Agencies or professionals	5	3.7%	52	38.5%	65	48.1%	13	9.6%	39	32.2%	23	19.0%	26	21.5%	21	17.4%	12	9.9%

Table 15: Length of time in farming and % of income from off-farm sources of farmers who access the different sources of advice for NRM activities

		Length of time in farming						% of income from off-farm sources					
		Less than 10 years		10 and 29 yrs		More than 30 yrs		1 – 29%		30 – 69%		More than 70%	
		n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
For establishing trees and shrubs on property	Wouldn't seek advice	3	6.7%	11	24.4%	31	68.9%	21	47.7%	9	20.5%	14	31.8%
	Other farmers	13	11.8%	38	34.5%	59	53.6%	43	38.7%	17	15.3%	51	45.9%
	Agencies or professionals	19	9.9%	76	39.8%	96	50.3%	75	38.9%	36	18.7%	82	42.5%
For improving groundcover	Wouldn't seek advice	3	7.1%	12	28.6%	27	64.3%	18	43.9%	7	17.1%	16	39.0%
	Other farmers	12	9.6%	42	33.6%	71	56.8%	51	40.2%	23	18.1%	53	41.7%
	Agencies or professionals	17	10.4%	66	40.2%	81	49.4%	65	39.4%	29	17.6%	71	43.0%
For improving dam and river areas through restricting stock access	Wouldn't seek advice	6	6.7%	24	26.7%	60	66.7%	42	46.7%	17	18.9%	31	34.4%
	Other farmers	11	13.9%	31	39.2%	37	46.8%	29	36.3%	12	15.0%	39	48.8%
	Agencies or professionals	16	11.9%	57	42.2%	62	45.9%	49	36.0%	26	19.1%	61	44.9%

Table 16: Farm size (hectares) of farmers who access the different sources of advice for NRM activities

		Less than 99ha		100 to 299 ha		300 to 999 ha		Over 1000ha	
		n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
For establishing trees and shrubs on property	Wouldn't seek advice	17	38.6%	10	22.7%	10	22.7%	7	15.9%
	Other farmers	39	37.1%	21	20.0%	20	19.0%	25	23.8%
	Agencies or professionals	64	34.2%	37	19.8%	47	25.1%	39	20.9%
For improving groundcover	Wouldn't seek advice	12	29.3%	14	34.1%	11	26.8%	4	9.8%
	Other farmers	48	39.3%	20	16.4%	29	23.8%	25	20.5%
	Agencies or professionals	56	34.8%	31	19.3%	38	23.6%	36	22.4%
For improving dam and river areas through restricting stock access	Wouldn't seek advice	24	27.6%	27	31.0%	22	25.3%	14	16.1%
	Other farmers	36	47.4%	7	9.2%	19	25.0%	14	18.4%
	Agencies or professionals	49	36.6%	22	16.4%	32	23.9%	31	23.1%

Question 5: What are the demographic characteristics of those who have participated in NRM activities compare to those farmers who don't?

Using the RWS 2018 survey data, we looked at gender, age and educational attainment of farmers who have participated in activities improve natural assets on their property. Results are reported in Table 17. These actions have been grouped accordingly:

1) Actions to increase the area of trees and shrubs. This included the percentage of farmers who had reported doing any of the following: establishing a new shelterbelt, improving an existing shelterbelt, protected paddock trees or remnant native vegetation in paddocks, planted/regenerated vegetation in and around dams, rivers or elsewhere on property.
2) Actions to improve water quality. This included the percentage of farmers who had reported doing any of the following: measures to slow the flow of rivers, streams or channels; measures to slow the flow of water across land when it rains, excluding stock access to dams and rivers, installing hardened access to points and installing watering points.
3) Actions to improve groundcover. This included the percentage of farmers who had reported doing any of the following: increasing area of deep-rooted perennial grasses, increasing native pastures, improving percentage of groundcover and reducing the amount of inorganic fertiliser.
4) Actions to control pests and weeds. This included the percentage of farmers who had reported doing any of the following: working with others to reduce invasive weeds and feral animals.

Please note: the numbers of farmers who have not participated in practices to improve natural assets on property is small, and data should be interpreted cautiously.

Findings:

When compared to those who would participate in natural asset management activities, those farmers who did not participate were more likely to:

- Be male (for actions to increase trees and shrubs and to improve water quality only)
- Have not completed year 12
- Have not attained a university qualification or TAFE certificate

There appeared to be no difference in the age of those who have and have not participated in improving natural assets on their property.

Table 17: Age, gender and educational attainment of farmers who have participated in activities aimed to improve natural assets on property

		Female		Male		< 39 yrs of age		40 to 69 yrs of age		Over 70 yrs of age		Completed Yr 12 high school		University or TAFE cert	
Participation in the following activities on current property		*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Actions to increase the area of trees and shrubs	No	10	17.9%	46	82.1%	5	9.1%	34	61.8%	16	29.1%	19	33.9%	24	42.9%
	Yes	101	34.9%	188	65.1%	18	6.2%	202	69.7%	70	24.1%	104	35.7%	211	72.5%
Actions to improve water quality	No	24	27.0%	65	73.0%	4	4.6%	67	77.0%	16	18.4%	24	27.3%	50	56.8%
	Yes	82	33.6%	162	66.4%	18	7.3%	162	66.1%	65	26.5%	96	39.0%	176	71.5%
Actions to improve groundcover	No	30	31.6%	65	68.4%	6	6.5%	69	75.0%	17	18.5%	28	29.5%	57	60.0%
	Yes	75	31.8%	161	68.2%	13	5.4%	160	66.9%	66	27.6%	92	38.7%	169	71.0%
Actions to control weeds and pest	No	26	31.3%	57	68.7%	7	8.6%	57	70.4%	17	21.0%	28	33.7%	48	57.8%
	Yes	78	31.6%	169	68.4%	12	4.8%	174	69.9%	63	25.3%	87	34.9%	178	71.5%

Question 6: What are the farming characteristics of farmers who participate in NRM activities.

Using the RWS 2018 survey data, we looked at the farm type, farm size (GVAP and hectares), length of time in farming and percentage of income from off-farm sources of those who have participated in any activities to aimed to improve natural assets on their property. Results are reported in Table 18, Table 19, Table 20, Table 21 and Table 22. These actions have been grouped accordingly:

1) Actions to increase the area of trees and shrubs. This included the percentage of farmers who had reported doing any of the following: establishing a new shelterbelt, improving an existing shelterbelt, protected paddock trees or remnant native vegetation in paddocks, planted/regenerated vegetation in and around dams, rivers or elsewhere on property.
2) Actions to improve water quality. This included the percentage of farmers who had reported doing any of the following: measures to slow the flow of rivers, streams or channels; measures to slow the flow of water across land when it rains, excluding stock access to dams and rivers, installing hardened access to points and installing watering points.
3) Actions to improve groundcover. This included the percentage of farmers who had reported doing any of the following: increasing area of deep-rooted perennial grasses, increasing native pastures, improving percentage of groundcover and reducing the amount of inorganic fertiliser.
4) Actions to control pests and weeds. This included the percentage of farmers who had reported doing any of the following: working with others to reduce invasive weeds and feral animals.

Please note: the numbers of farmers who have not participated in practices to improve natural assets on property is small, and data should be interpreted cautiously.

When compared to those who would participate in natural asset management activities, the following was found:

- Overall there was not any observational differences in the farm characteristics of those who engaged in natural asset management practices compared to those who did not.
- Those with livestock only on their property were more likely to engage in practices aimed at improving the quality of their water.
- Those with smaller properties (>99ha is size) were less likely to participate in pest and weed control their properties.
- Those who had been farming for more than 30 years were less likely to participate in all types of natural asset management, with the exception of pest and weed control.
- Those who earn less than 30% of income from off-farm sources were less likely to participate in actions to increase the area of trees and shrubs on their property.

Table 18: Farm type of farmers who have participated in activities aimed to improve natural assets on property

		Farm Type							
		Crop		Livestock		Mixed crop-livestock		Other	
Participation in the following activities on current property		*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Actions to increase the area of trees and shrubs	No	3	5.7%	14	26.4%	30	56.6%	6	11.3%
	Yes	18	6.2%	91	31.4%	147	50.7%	34	11.7%
Actions to improve water quality	No	7	8.1%	19	22.1%	49	57.0%	11	12.8%
	Yes	12	4.9%	84	34.4%	123	50.4%	25	10.2%
Actions to improve groundcover	No	8	8.6%	30	32.3%	45	48.4%	10	10.8%
	Yes	12	5.0%	73	30.5%	125	52.3%	29	12.1%
Actions to control weeds and pests	No	6	7.5%	23	28.8%	39	48.8%	12	15.0%
	Yes	15	6.0%	77	30.9%	131	52.6%	26	10.4%

Table 19: Farm size (GVAP) of farmers who have participated in activities to improve natural assets on property

		Farm size (Gross Value Agricultural Product)									
		< $39,999		$40,000 to $99,999		$100,000 to $299,999		$300,000 to $999,999		$1m or more	
Participation in the following activities on current property		*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Actions to increase the area of trees and shrubs	No	10	20.4%	12	24.5%	12	24.5%	11	22.4%	4	8.2%
	Yes	93	34.7%	44	16.4%	63	23.5%	39	14.6%	29	10.8%
Actions to improve water quality	No	24	28.9%	14	16.9%	18	21.7%	19	22.9%	8	9.6%
	Yes	67	30.3%	41	18.6%	57	25.8%	30	13.6%	26	11.8%
Actions to improve groundcover	No	28	33.7%	13	15.7%	18	21.7%	12	14.5%	12	14.5%
	Yes	65	29.4%	42	19.0%	56	25.3%	37	16.7%	21	9.5%
Actions to control weeds and pests	No	26	34.7%	15	20.0%	17	22.7%	10	13.3%	7	9.3%
	Yes	70	30.6%	40	17.5%	54	23.6%	38	16.6%	27	11.8%

Table 20: Area of farmland (hectares) of farmers who have participated in activities to improve natural assets on property

		Area of farmland (hectares)							
		Less than 99		100 to 299		300 to 999		Over 1000	
Participation in the following activities on current property		*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Any tree action	No	20	37.7%	7	13.2%	15	28.3%	11	20.8%
	Yes	89	31.4%	67	23.7%	72	25.4%	55	19.4%
Any water action	No	29	33.7%	18	20.9%	22	25.6%	17	19.8%
	Yes	74	31.1%	51	21.4%	64	26.9%	49	20.6%
Any groundcover action	No	35	38.9%	17	18.9%	20	22.2%	18	20.0%
	Yes	69	29.5%	53	22.6%	65	27.8%	47	20.1%
Any pest weed action	No	34	43.6%	19	24.4%	16	20.5%	9	11.5%
	Yes	67	27.3%	52	21.2%	69	28.2%	57	23.3%

Table 21: Length of time in farming of farmers who have participated in activities to improve natural assets on property

		Length of time in farming					
		Less than 10 years		Between 10 and 29 yrs		More than 30 yrs	
Participation in the following activities on current property		*n*	*%*	*n*	*%*	*n*	*%*
Actions to increase the area of trees and shrubs	No	3	5.6%	8	14.8%	43	79.6%
	Yes	25	8.6%	98	33.8%	167	57.6%
Actions to improve water quality	No	6	6.8%	20	22.7%	62	70.5%
	Yes	20	8.2%	79	32.4%	145	59.4%
Actions to improve groundcover	No	6	6.4%	23	24.5%	65	69.1%
	Yes	19	8.0%	78	32.8%	141	59.2%
Actions to control weeds and pests	No	6	7.4%	20	24.7%	55	67.9%
	Yes	19	7.6%	81	32.4%	150	60.0%

Table 22: Percentage of income from off-farm sources of farmers who have participated in activities to improve natural assets on property

		% of income from off-farm sources					
		1 - 29%		30 - 69%		More than 70%	
Participation in the following activities on current property		*n*	*%*	*n*	*%*	*n*	*%*
Actions to increase the area of trees and shrubs	No	31	55.4%	9	16.1%	16	28.6%
	Yes	122	41.8%	59	20.2%	111	38.0%
Actions to improve water quality	No	44	49.4%	14	15.7%	31	34.8%
	Yes	106	43.3%	53	21.6%	86	35.1%
Actions to improve groundcover	No	46	48.4%	14	14.7%	35	36.8%
	Yes	103	43.3%	50	21.0%	85	35.7%
Actions to control weeds and pests	No	36	43.4%	20	24.1%	27	32.5%
	Yes	110	44.2%	46	18.5%	93	37.3%

Reference List

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Vanclay, F. (2004). Social principles for agricultural extension to assist in the promotion of natural resource management. *Australian Journal of Experimental Agriculture*, *44*(3), 213–222. doi:10.1071/EA02139

APPENDIX 1: RWS 2018 questions included in the Sustainable Farms evaluation report

Have you done any of the following on the rural land you currently live on or manage?	Yes	No	N/A
Established new shelterbelts using native species	◯	◯	◯
Improved existing shelterbelts using native species	◯	◯	◯
Protected paddock trees or remnant native vegetation in paddocks e.g. by fencing	◯	◯	◯
Planted/regenerated vegetation in and around dams	◯	◯	◯
Planted/regenerated vegetation around streams/rivers (excluding dams)	◯	◯	◯
Planted/regenerated vegetation in areas other than dams/streams	◯	◯	◯
Implemented measures to slow the flow of rivers/ streams/ channels on my property	◯	◯	◯
Implemented measures to slow the flow of water across my land when it rains	◯	◯	◯
Excluded stock access to dams using fencing or other exclusion methods	◯	◯	◯
Excluded stock access to rivers/streams on your property using fencing or other exclusion methods	◯	◯	◯
Installed hardened access points to dams to enable stock access with reduced damage	◯	◯	◯
Installed watering points away from streams/dams to reduce stock damage to waterways	◯	◯	◯
Increased the area of deep-rooted perennial grasses on my land	◯	◯	◯
Increased the area of native pasture on my land by replacing exotic pasture	◯	◯	◯
Improved groundcover (e.g. through increasing percentage of groundcover throughout the year)	◯	◯	◯
Worked with others to reduce feral animals in my district	◯	◯	◯
Reduced amount of inorganic fertiliser needed to produce the same yield	◯	◯	◯
Worked with others to reduce invasive weeds in my district	◯	◯	◯

If you chose to do the following in future, which organisations would you seek advice from?

<u>Establishing trees or shrubs on your property</u> (seeding, regenerating or planting) *Select all that apply*	**<u>Improving groundcover quantity or quality</u>** *Select all that apply*	**<u>Improving dam or river areas through restricting stock access</u>,** *Select all that apply*
◯ I wouldn't seek advice ☐ Landcare ☐ Natural resource management agency e.g. LLS, CMA, NRM ☐ An expert you paid ☐ Greening Australia ☐ Australian National Uni field staff ☐ Other farmers/landholders ☐ Others (please describe)	◯ I wouldn't seek advice ☐ Landcare ☐ Natural resource management agency e.g. LLS, CMA, NRM ☐ An expert you paid ☐ Greening Australia ☐ Australian National Uni field staff ☐ Other farmers/landholders ☐ Others (please describe)	◯ I wouldn't seek advice ☐ Landcare ☐ Natural resource management agency e.g. LLS, CMA, NRM ☐ An expert you paid ☐ Greening Australia ☐ Australian National Uni field staff ☐ Other farmers/landholders ☐ Others (please describe)

Have you heard of the Sustainable Farms initiative being conducted by the Australian National University? *Select one*	◯ Yes – I'm actively involved ◯ Yes – I've been involved in the past	◯ Yes – I've heard of it ◯ Not sure ◯ No

To what extent do you agree or disagree with the following statements about the benefits and costs of **<u>increasing the areas of trees and shrubs on the land you manage</u>**?

Please answer even if you haven't done this on your land. If you have done this, please answer based on the benefits and costs you have experienced. If you haven't done it, please answer based on your views about likely benefits and costs.

To what extent do you agree or disagree that…	**Strongly DISAGREE** ①	②	③	④	⑤	⑥	**Strongly AGREE** ⑦	Don't know
Planting trees and shrubs in the right places can increase farm profitability	◯	◯	◯	◯	◯	◯	◯	◯
Increasing trees/shrubs increases pollinating insects	◯	◯	◯	◯	◯	◯	◯	◯
Increasing trees/shrubs can increase livestock productivity (e.g. increased wool, weight gain, milk production)	◯	◯	◯	◯	◯	◯	◯	◯
Increasing trees/shrubs can benefit pasture/crop growth (e.g. through increased pollination, reduced transpiration, reduced windblasting)	◯	◯	◯	◯	◯	◯	◯	◯
Increasing trees/shrubs on my land improves soil health	◯	◯	◯	◯	◯	◯	◯	◯
Increasing trees/shrubs improves habitat for native animals and birds	◯	◯	◯	◯	◯	◯	◯	◯
The financial benefits of increasing trees and shrub cover on my land outweigh the financial costs	◯	◯	◯	◯	◯	◯	◯	◯
Overall, the environmental and other benefits of increasing trees and shrub cover on my land outweigh the financial costs	◯	◯	◯	◯	◯	◯	◯	◯

To what extent do you agree or disagree with the following statements about the benefits and costs of **increasing the extent and health of groundcover** on the land you manage?

Please answer based on your experiences managing groundcover on the land you manage (e.g. pasture, crop stubble retention).

To what extent do you agree or disagree that…	Strongly DISAGREE ①	②	③	④	⑤	⑥	Strongly AGREE ⑦	Don't know
I can increase groundcover on my land without reducing farm production	○	○	○	○	○	○	○	○
Increasing groundcover extent and health can increase my farm profitability e.g. through improved feed for stock, reduced input costs	○	○	○	○	○	○	○	○
Improving health & extent of groundcover benefits stock health (e.g. through reduced parasites, better feed)	○	○	○	○	○	○	○	○
Improving health & extent of groundcover on my land improves soil health	○	○	○	○	○	○	○	○
Improving health & extent of groundcover on my land improves water quality	○	○	○	○	○	○	○	○
The financial benefits of increasing groundcover on my land outweigh the financial costs	○	○	○	○	○	○	○	○
Overall, the environmental and other benefits of improving groundcover on my land outweigh the financial costs	○	○	○	○	○	○	○	○

To what extent do you agree or disagree with the following statements about the benefits and costs of **excluding or reducing stock access to rivers, streams or dams on your property** (e.g. through fencing out some areas)?

Please answer if you are a grazier (go to the next question if you are not a grazier). If you have done this, please answer based on the benefits and costs you have experienced. If you haven't done it, please answer based on your views about likely benefits and costs.

To what extent do you agree or disagree that…	Strongly DISAGREE ①	②	③	④	⑤	⑥	Strongly AGREE ⑦	Don't know
The financial benefits of reducing stock access to water areas outweigh the financial costs	○	○	○	○	○	○	○	○
Overall, the environmental and other benefits of reducing stock access to water areas outweigh the financial costs	○	○	○	○	○	○	○	○
Reducing stock access to streams/dams reduces injuries to stock e.g. from bogging, falling down banks	○	○	○	○	○	○	○	○
Reducing stock access to streams/dams reduces stock parasites and diseases e.g. brucellosis, liver fluke, leptospirosis	○	○	○	○	○	○	○	○
Reducing stock access to streams/dams improves water quality	○	○	○	○	○	○	○	○
Reducing stock access to streams/dams increases plant growth and habitat for habitat for aquatic and semi-aquatic animals e.g. frogs, water birds	○	○	○	○	○	○	○	○

What area of land do you manage? *Management means you are helping make decisions about how the land will be used, often with a spouse or business partner*	*This includes land you own, sharefarm, lease or manage on behalf of others* _____ hectares
In the last 12 months, what proportion of your household income was earned on- and off-farm? *Include all income earned by the people in your household, not just yourself.* ***If you are not sure, please estimate***	Household income from farm business _____% Off-farm household income: _____% *Please ensure total adds up to 100%*

How important are the following objectives to your farm management?	NOT AT ALL Important						VERY Important

	①	②	③	④	⑤	⑥	⑦
Maintaining good groundcover	◯	◯	◯	◯	◯	◯	◯
Ensuring high nutritional value of groundcover	◯	◯	◯	◯	◯	◯	◯
Minimising the volume of inputs used on my farm e.g. fertiliser	◯	◯	◯	◯	◯	◯	◯
Matching production levels to soil and pasture capacity	◯	◯	◯	◯	◯	◯	◯
Increasing the organic matter in my soil	◯	◯	◯	◯	◯	◯	◯
Increasing the diversity of plants and organisms on my land	◯	◯	◯	◯	◯	◯	◯
Monitoring whether NRM/environmental objectives are being achieved on the farm, e.g. through photos or documenting change	◯	◯	◯	◯	◯	◯	◯

Do you agree or disagree with the following statements about farm planning? *Note: planning does not have to involve a written document*	**Strongly DISAGREE** ①	②	③	④	⑤	⑥	**Strongly AGREE** ⑦
On our farm, we have a plan in place for the next drought	◯	◯	◯	◯	◯	◯	◯
On our farm, we have a plan for natural resource management objectives e.g. for soil health, maintaining water quality, vegetation management	◯	◯	◯	◯	◯	◯	◯

Farm finances

For the period July 1 2017 to June 30 2018 what was your <u>gross value of agricultural production</u>? Your gross value of agricultural production is the total value of sales before costs, also called gross earnings. Please estimate if you do not yet know your precise turnover.	◯ Nil (no farm sales) ◯ <$5,000 ◯ $5,000-$39,999 ◯ $40,000-$99,999 ◯ $100,000-$199,999 ◯ $200,000-$299,999	◯ $300,000-$399,999 ◯ $400,000-$499,999 ◯ $500,000-$749,999 ◯ $750,000-$999,999 ◯ $1 million to $1.99 million ◯ $2 million or more