

Hills and Fleurieu trend & condition snapshot 2021

Land

Improving land condition is essential for the long-term viability of the Hills and Fleurieu region. A healthy land condition underpins the region's productive potential, the health of its natural systems and the wellbeing of its people.

This regional snapshot offers a summary of conditions and issues across four areas important to improving land condition. It is structured by the following Focus Areas identified in the [Hills and Fleurieu Landscape Plan 2021-26](#) as requiring priority attention:

- L1. The impact and spread of weeds
- L2. The impact and spread of pest and over-abundant native animals
- L3. Regenerative agriculture
- L4 Future-proofing agriculture.

This summary document draws on a mix of sources, including published and unpublished reports, internal datasets, anecdotal observations and qualitative assessments by landscape officers and other specialists.

L1. Weeds

Indicator	Condition	Trend in health
 Weeds	 Poor	 Variable/Declining

Weeds are a significant and long-standing problem for the region. Regional data on weeds and weed management is not comprehensive, but we know there is a large number of weed species in the region. These include widely established weeds like blackberry and gorse, and recently detected weeds like Parrot Feather. Many weeds cause significant economic and ecological impacts.

Weeds undermine land condition by out-competing crops and increasing on-farm costs. They also reduce landscape amenity, impact biodiversity and can increase fire risk.

Nationally, weeds are estimated to cost the Australian economy \$4 billion per yearⁱ. Records from 2007 show farms in South Australia spent about \$19,000 per year on pest plants and animal controlⁱⁱ.

Extrapolating from surveys and reports covering the former Adelaide Mount Lofty Ranges and South Australian Murray-Darling Basin NRM regionsⁱⁱⁱ, weed abundance and distribution is either stable or increasing – meaning land condition is declining. Exceptions include Buffel Grass, which is under control and no new plants are being found.

Private gardens are the main source of new and emerging weeds in the region; a risk that appears to be increasing. Weeds are spread by wind and water, birds and animals, and unauthorised dumping of soil and garden waste.

Table 1. State Report Card: Invasive plant species trends in NRM regions for the five-year period from 2015–19. Data from qualitative surveys.

Weeds and pest indicator species	AMLR 5yr Trend [#]	SAMDB 5yr Trend [#]
African boxthorn	Unknown	0
Asparagus weeds	0	0
Athel pine	0	-1
Boneseed	1	0
European Blackberry	0	1
Bridal creeper	1	0
Brooms	Unknown	0
Buffel grass	0	-1
Chilean needle grass	0	Not present
Gorse	Unknown	0
Opuntoid cacti	1	-1
Silverleaf nightshade	0	1
Willows	0	0

Number indicates trend: 2 = Major increase in abundance and or spreading; 1 = Moderate increase; 0 = Stable; -1 = Moderate decrease in abundance and or receding; -2 = Major decrease. # Hills and Fleurieu region covers parts of the previous AMLR and SAMDB NRM regions.

About this document

This snapshot summarises regional conditions relevant to the 'Land Priority' – one of five priorities in the [Hills and Fleurieu Landscape Plan 2021-2026](#).

To read the Landscape Plan or the other regional snapshot documents on water, nature, climate and community, go to: www.landscape.sa.gov.au/hf.

Challenges

Because of the sheer number and extent of weeds across the region (there are over 140 declared species present), eradication is impossible in most instances and impact minimisation is extremely expensive.

In this context it is generally understood that to maximise the benefits of weed control, effort is needed across three areas in parallel:

1. Detecting and preventing weed establishment
2. Eradicating localised weed populations
3. Containing the spread of established weeds

Achieving these objectives depends on overcoming a number of challenges. One is aligning the control efforts of private landholders and public agencies across the region. Unless people carrying out controls are focused on a common set of species and/or priority locations it is difficult to have any meaningful impact. Building this alignment is a challenge given small landholders, conservationists and primary producers often prioritise weeds differently.

Finding easier ways to monitor weeds is another challenge. Because so many infestations are difficult to locate and map, determining a baseline condition and then tracking the spread or removal of weeds across the landscape is difficult. Monitoring priority weeds needs to occur at a frequency and level of detail to inform control efforts. Without improved monitoring, it is not possible to align and evaluate landscape scale weed control.

A third challenge is increasing the capacity and willingness of landholders to manage weeds. While the *Landscape South Australia Act 2019* identifies landholders as largely responsible for managing declared weeds on their properties, in practice, many people don't recognise weeds as a problem, don't understand which weeds are particularly problematic or have the knowledge, skills, time and resources to control them. Addressing these barriers is critical.

L2. Pests and over-abundant native Animals

Indicator	Condition	Trend in health
 Pest animals	 Poor	 Variable

Like weeds, pest animals and impact-causing native species do significant damage in the region. In 2013–14 pest animals cost the Australian economy \$743 million per annum^{iv}. They affect most agricultural sectors by damaging crops, reducing livestock feed, predating on lambs and causing damage to infrastructure such as fences and dams. They can also be traffic hazards on roads and cause problems in townships. Grazing, in particular by goats, deer and kangaroos, also has a substantial impact on native vegetation - undermining habitat quality, reducing the efficacy of revegetation and damaging natural regeneration after fires.

The latest pest animal surveys were reported in 2018 (across the previous AMLR^v region).

Foxes are present throughout the region and their population is considered stable despite on-going control. Foxes are controlled most intensively in production systems where they prey on lambs, chickens and other livestock.

Goats exist in multiple distinct and geographically separate locations. Monitoring of grazing impacts at sites such as Montacute Conservation Park have shown the devastating impacts of feral goat populations. Numbers were considered stable in 2017. Since then, control programs have significantly reduced numbers in the largest populations and achieved local eradication at some sites.

Rabbits are present throughout the region and were recorded as stable or in decline in 2017. However, since 2019 the community has consistently reported high rabbit numbers, especially in the central Adelaide Hills. This anecdotal evidence matches a marked increase in landholder demand for Pindone (poison) treated carrots. Board sales of Pindone from the Willunga office tripled between 2019-20 and 2020-21.

Deer are spread across the region, but vary in density. Numbers were reported as rising in 2017 and despite efforts by landholders and the board, there has been little change in deer presence across the region. Regulation of deer farms has also been tightened in recent years to reduce deer escape into feral deer populations. However, the cost and implementation of these regulatory changes is a challenge to some farmers.

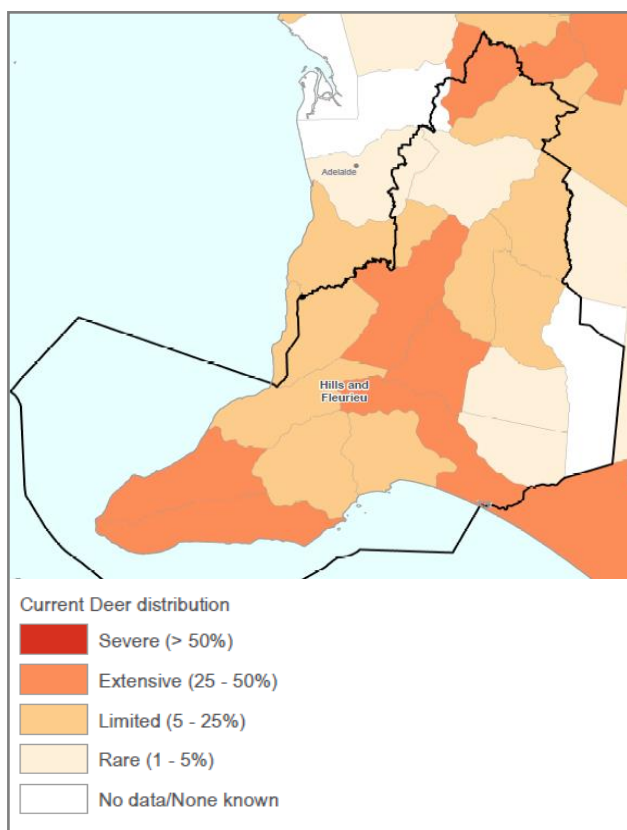


Fig. 1. Feral deer presence in the region, PIRSA 2021

Feral pigs, wild dogs, camels and other pest animals are not present in the region. The possible establishment of feral pigs is considered a primary risk to regional landscape health due to their potential to spread diseases and damage waterways.

Western Grey Kangaroos and Little Corellas are two native species that cause substantial damage in the region. Little corellas are primarily a social concern in the communities where they damage township amenity (loud noises and damaging trees, parks and gardens). Western grey kangaroo numbers have a more widespread ecological and economic impact due to their high and increasing numbers. As

mentioned, their primary damage is to habitat and primary production^{vi}.

Challenges

Reducing the impact of pest animals in the region faces similar challenges to weed control.

A key issue is increasing the capacity and involvement of landholders in pest animal control. Because animal control requires well-timed, sustained and coordinated efforts across the whole region to be effective, greater landholder involvement is vital.

Another issue is resistance to animal control from some parts of the community. Unless the regional community understands and accepts the need for animal control it will be difficult to reduce the damage from pest animals over the long term. This is particularly the case for impact causing natives such as kangaroos whose impacts have not been widely communicated to the wider community. More work is required to build understanding and trust in why controls are needed and how they are done.

L3. Regenerative Agriculture and Land Management

Agriculture is an important industry within the region, with grazing, cropping and horticulture particularly successful forms of land use (see Fig 6). Part of this success is due to the diversity of climate and soil conditions across the region. This variety has created a mosaic of unique environments enabling areas like the Adelaide Hills, McLaren Vale and Langhorne Creek wine regions and the apple and pear growing areas around Lenswood to develop.

The success of different production systems across the region is a sign of the underlying richness of land condition. However, these successes also partly obscure the damage post-colonial land management has done to the region. In reality, much of the region's soils, waterways and biodiversity are severely degraded.

Fortunately, over the past few decades, there has been some recognition of this damage and the loss of productive potential it has caused.

Many land managers have now adopted practices that slow or stabilise this degradation. These include stubble retention, reduced chemical fertiliser use, increased crop and grazing rotation, and the exclusion of stock from waterways and habitat.




More recently, a growing number of primary producers and land managers have been working to improve land health through holistic or 'regenerative' approaches. These efforts build long-term productive capacity and commercial resilience by managing soils, waterways, habitat and production as an integrated self-sustaining system. While there are different approaches with their own particular emphasis^{vii} they all stress building the underlying natural capital that sustains productivity and avoid highly extractive practices that maximise short-term productivity.

SOIL HEALTH

Many of these 'regenerative' approaches put a high priority on building and sustaining soil health. Soil health reflects the ability of soil to function as a living ecosystem. It is one of the region's most valuable forms of natural capital. When managed and nurtured as an ecosystem, soil provides many benefits such as boosting biological productivity, carbon storage, fertility, plant, animal and human health and commercial resilience.^{viii}

Due to the complex nature of soils, there is no single approach for measuring soil health^{viii}. However, three key indicators of soil health for the region are soil acidity, erosion prevention and soil carbon.

SOIL ACIDITY

Indicator	Condition	Trend in health
 Soil acidity	 Poor	 Declining

Significant areas of land in the region are prone to soil acidity (Fig. 2). Natural soil acidification rates are accelerated by the growing and removal of agricultural products. Strongly acidic soils adversely impact on the health of soils, plants, livestock and watercourses.

Soil acidity is an increasing and significant issue in the region. Regional surveys have shown there is good awareness of soil acidity by

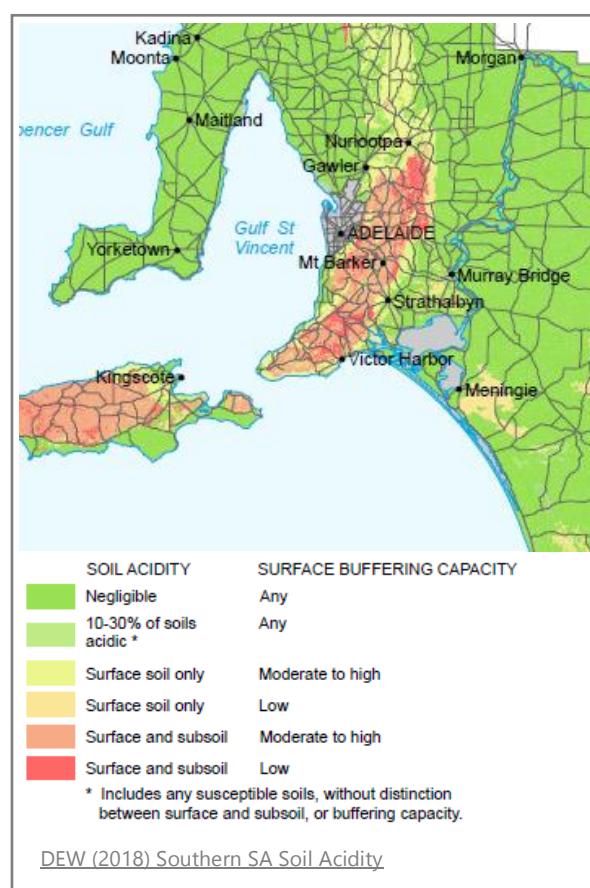


Fig. 2 Soil acidity in the Hills and Fleurieu region.

agricultural landholders in the region but there are misunderstandings about causes of, and appropriate treatments for acid soils.

SOIL EROSION

Erosion involves the loss of soil due to wind or water. Fortunately, erosion is not as prevalent as in other regions^{ix} but does exist in localised areas - such as gully erosion on specific soil types.

Maintaining ground cover vegetation is central to preventing soil erosion and rehabilitating affected land. Land management practices in the region that have been key to reducing erosion include grazing management, no till cropping and cover- and inter- row cropping.

SOIL CARBON

Soil carbon is another important indicator of soil health. Soil carbon is an important component of soil's organic matter and is a vital ingredient in shaping soil structure, biomass, nutrient load and water retention capacity.

Fortunately, many soils in the region (Fig. 3) have relatively high soil carbon compared to other parts of South Australia. This is largely due to the region's higher rainfall.

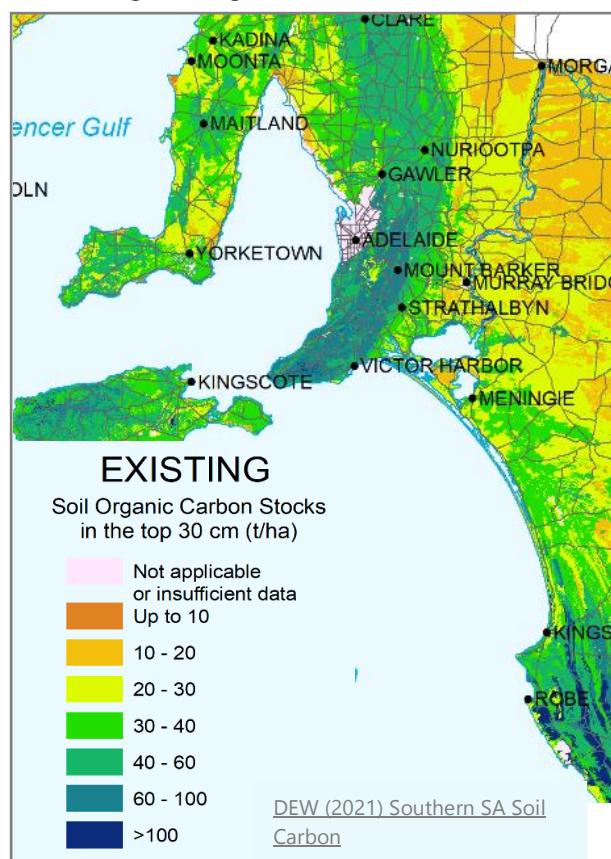


Fig. 3 Soil carbon in the Hills and Fleurieu region

LANDHOLDER CAPACITY AND KNOWLEDGE

Land condition cannot be improved unless landholders have the understanding, capacity and willingness to actively manage their properties.

What little data exists suggests a wide spectrum of land management skills and knowledge across the region. A randomised survey in the previous AMLR NRM region in 2017 found 29% of respondents believed they had in-depth land management knowledge ^x while 16% self-assessed as having little or none. Whether or not these assessment are accurate indicators of capacity, they highlight the need to build capacity across the spectrum. The types of regenerative practices needed to reverse declines in land condition and build resilience to climate change rely on more in-depth knowledge.

Improving land condition in areas such as soil health (see Fig. 4) can result in multiple benefits and doesn't need to be onerous. But building the skills and experience required is a long-term process that requires on-going assessment of conditions and adjustment of management practices.

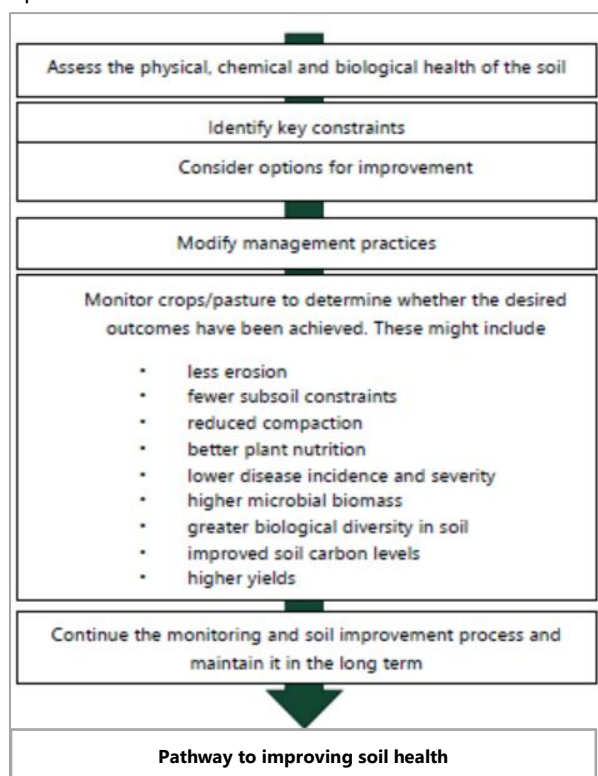


Fig. 4 A pathway to improving soil health

Challenges

The main challenges to improving land management relate to landholder capacity and the complexity of assessing land condition.

Land management is a complex skillset that takes substantial time and practice to build up, let alone stay up-to-date with new research.

Across the region, factors like the low landholder awareness of responsibilities, as well as high property turn-over (approx. 7% pa), an ageing farmer population and absentee landholdings all work against building land management skills across the community.

Understanding how to assess and track land condition is another challenge because it is such a complex issue and requires monitoring over vast areas. Essentially, there is no easy measure for many basic characteristics like soil

health. And while we can use surrogate indicators, gathering sufficient data to give a meaningful assessment across the region would require substantial resources needed on-ground. In the absence of widespread monitoring, best practice suggests producers should focus on the specific factors constraining productivity and adopt practices to help overcome these.

L4. Future-proofing Agriculture

The region's primary industries contribute more than \$400 million per year to the South Australian economy. Grazing accounts for over 45% of land use, with other significant industries including apple, pear and cherry production, cropping, viticulture, and seafood.

Securing agricultural land for the long-term future of the region's food and fibre economy is important for consumers, producers and the wider economy. Long-term threats to agriculture include loss of agricultural land to urban encroachment, climate change and extreme weather events.

PROTECTING AGRICULTURAL LAND

The State Government's 30-Year Plan for Greater Adelaide (2017 Update) sets out policies for where urban development can occur in the region, and a target for 90% of all new housing to be built in established townships and designated urban development areas by 2045. The intent is to protect our food bowl, tourism assets and picturesque landscapes.

Environment and Food Production Areas (EFPA) were introduced in 2017 to help protect food production and agricultural lands and contain urban development^{xi}. However, they only limit new land division proposals for residential purposes – new buildings, structures and land division for other purposes can still occur.

CARBON FARMING OPPORTUNITIES

Carbon farming involves agricultural practices that reduce carbon emissions or actively sequester carbon into the landscape.

The carbon opportunity map (Fig. 5) shows the potential to increase soil organic carbon storage in South Australia's agricultural soils. Due to higher rainfall and land uses in our region, some of the highest potential for soil carbon farming is in the Hills and Fleurieu.

There may also be carbon planting opportunities – the biggest gains are likely to be where biodiversity and productivity gains are also achieved in parallel with the carbon credits.



Fig. 5 Soil carbon opportunities in the Hills and Fleurieu

LOCAL PROVENANCE, REGENERATIVE AND CLIMATE-READY FOOD PRODUCTION

In order to strengthen the capacity of regional producers to survive and adapt to future challenges such as climate change, work is needed to increase local demand for their produce and develop systems that incentivise further innovation.

The region has a network of thriving local markets, where consumers can purchase directly from producers^{xii}. Local food businesses also connect directly with local producers for goods and promote regional food and wine^{xiii}. More work is needed to build on this foundation across the region.

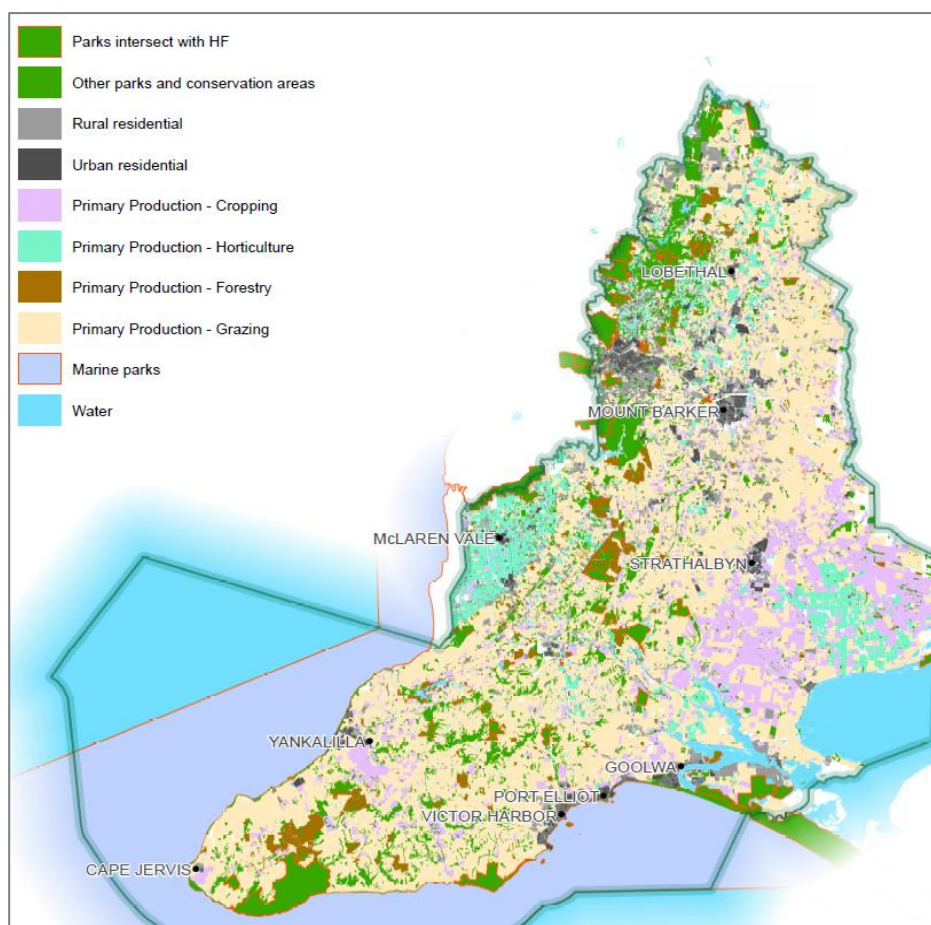


Fig. 6 Land uses in the Hills and Fleurieu region (2021)

ⁱSinden et al. 2004. The economic impacts of weeds in Australia. CRC Weed Management, technical series.

ⁱⁱ Australian Bureau of Statistics (2008). 2006-2007 Natural Resource Management on Australian Farms. Canberra.

ⁱⁱⁱLand: invasive species Abundance and distribution of established invasive species. SA Environmental trend and condition report card 2018

https://data.environment.sa.gov.au/Content/Publications/B ooklet_29_RC408_LandInvasiveSpp.pdf

^{iv} McLeod, R. 2016. Cost of pest animals in NSW and Australia, 2013-14. eSYS Development PTY Ltd.

<https://invasives.com.au/wp-content/uploads/2019/02/Cost-of-Pest-Animals-in-NSW-and-Aus-2013-14-web-HR.pdf>

^v Adelaide Mount Lofty Ranges (AMLR) NRM board

^{vi}Kangaroo conservation and management, DEW, Online: https://www.environment.sa.gov.au/topics/plants-and-animals/Abundant_species/kangaroo-conservation-and-management

^{vii} Leask, R. 2020 Is Being Sustainable Enough for Australian Wine? Nuffield Australia.

[https://www.wineaustralia.com/getmedia/f9ec53ad-482f-](https://www.wineaustralia.com/getmedia/f9ec53ad-482f-4b3e-b56d-f2378e4b9613/WA-L1802-Nuffield-Final-Report-(Richard-Leask).pdf)

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^{viii} DEW. 2021. A Health Check for our Agricultural Soils.

<https://data.environment.sa.gov.au/Land/Land-Resources/>

^{ix} DEW. 2020. Technical information supporting the 2020 agricultural land (days protected from soil erosion) trend and condition report card. DEW Technical note 2020/14, Government of South Australia, Department for Environment and Water, Adelaide.

^xAMLR. 2016. Unreached Landholder Survey. Harrison Research

^{xi}Environment and Food Production Areas – FAQ. Online: https://plan.sa.gov.au/_data/assets/pdf_file/0011/282935/FAQ_-_Environment_and_Food_Production_Areas.pdf

^{xii}Adelaide Hills Markets, Adelaide Hills, Online:

<https://www.visitadelaidehills.com.au/markets:https://fleurieupeninsula.com.au/regional-markets>

^{xiii}, Markets. Fleurieu Peninsula. Online:

<https://fleurieufood.com.au/>