

The Hon. David Basham  
Minister for Primary Industries and Regional Development  
GPO Box 1671  
Adelaide SA 5001

Royal Society SA  
C/- South Australian Museum  
North Terrace, Adelaide  
SOUTH AUSTRALIA 5000  
Telephone messaging (08) 8207 7590  
Email [roysocsa@gmail.com](mailto:roysocsa@gmail.com)  
Web address [www.rssa.org.au](http://www.rssa.org.au)

ABN 58 648 967 690

Subject: Pastoral Land Bill 2020

Dear Minister,

We write to you as the elected council and senior members of the Royal Society of South Australia (RSSA) regarding the *Pastoral Lands Bill 2020*.

*In summary we do not support the proposed Bill as it substantially reduces the role of science in informing the management of our pastoral lands. We recommend that the role of science be strengthened in a revision of the Bill – a role that will become increasingly more important in a changing climate.*

With its origins in 1834 and established in 1880 The Royal Society of South Australia is a membership based learned society dedicated to the promotion and advancement of science. The RSSA and its members have a long association with South Australia's pastoral region. We have published the *Natural History of the Flinders Ranges* and the *Natural History of the North East Deserts*. Since its first issue in 1877<sup>1</sup>, our journal *The Transactions of the Royal Society of South Australia* has published numerous high-quality peer reviewed research articles concerning South Australia's pastoral areas. Many of the RSSA's past Presidents have had strong associations with the pastoral areas and Dr R. T. Lange was awarded the Society's Verco medal in 1990 for his distinguished scientific work in arid zone botany and ecology.

We have reviewed the *Pastoral Lands Bill 2020* and are concerned at the absence of scientific advice and expertise in managing South Australia's pastoral lands. These changes are a regression from science's central role in the current *Pastoral Land Management and Conservation Act 1989*. The lack of science in the Bill will lead to poorer management and increasing land degradation. Rather than remove the role of science – it is vital that it be increased - as over the next decades climate change will increasingly impact on our pastoral lands. Understanding the complex interactions between climate change and land management on our pastoral land's native flora and fauna requires more scientific investigation as published in *The Transactions of the Royal Society of South Australia* special 1994 volume - Climate Change and its Implications for South Australia<sup>2</sup>. – not less. Furthermore, the two ecosystems that underpin South Australia's pastoral lands, the Western-central Arid Zones and the Mediterranean forests and woodlands are both exhibiting signs of collapse (Berstrom et al.

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<sup>1</sup> First published as the *Transactions and Proceedings and Report of the Philosophical Society of Adelaide, South Australia*.

<sup>2</sup> *Transactions of the Royal Society of South Australia* (1994) vol **118**. Climate Change and its Implications for South Australia.

2021<sup>3</sup>). Both climate change and human activity are identified as current and future drivers of this ongoing catastrophe.

With arid regions warming faster than coastal areas, and increasing tree mortality (Bergstrom et al. 2021), the impact of climate change on our pastoral areas is already apparent and will increase over the coming decades. Increased desertification is a real risk, one that could be exacerbated by poor land management. This alone argues for increased scientific understanding of the interplay between climate change and land management. It is plausible that increased desertification - resulting from a decrease in vegetation cover – could, through decreased shading and evapotranspiration, further increase air temperature. The summer heat waves that move south into our major populated areas are generated in Australia's arid inland. These heat waves will become hotter, longer, and more frequent. They can be disastrous, with the 2009 south eastern Australian heatwave estimated to have killed hundreds of people (Saniotis et al., 2015<sup>4</sup>). This plausible link between climate change, land use, vegetation cover and increased air temperature is a crucial knowledge gap for South Australia. If proven, it would show that our vast interior is vital green infrastructure for regulating the states climate and for sequestering carbon dioxide from the atmosphere (cf Chang et al., 2021<sup>5</sup>). Scientific knowledge must be prioritized to answer this question. Furthermore, this knowledge gap is apparent in the *Climate Change Science and Knowledge Plan for South Australia*<sup>6</sup> which when discussing heat waves describes projections for New South Wales and the ACT, for lack of South Australian studies.

By downgrading the importance of the natural sciences, particularly ecology and soil science the Bill will degrade South Australia's scientific capacity, reducing scientific research output and demand for scientists with skills in these areas. Without supporting the scientific disciplines that underpin sustainable management of the arid zones this expertise may be lost through attrition of current expertise and lack of training of the next generation of scientists.

More than ever scientific expertise is needed to manage our arid zones. Climate change will bring unprecedented change to our pastoral areas and understanding and managing this will require extensive and robust scientific research. Through not supporting the scientific acquisition of knowledge needed to understand and manage the changes to our pastoral areas, the Bill does not meet its own requirements of sustainability.

Regarding the specific text of the Bill we offer detailed comments below:

## **Part 2 – Objects and duties**

*5(b) to ensure the State's pastoral lands are sustainable and maintain productive capacity of the land for future generations*

Achieving long term sustainability, particularly in a changing climate, requires a sound scientific understanding of the interaction between natural process and human actions. How this will be achieved – indeed what even is meant by sustainable - is not addressed in the necessary detail in the Bill. Without this detail, and without a provision for gaining the necessary scientific understanding of what sustainable pastoral lands are in the Bill, this object is unachievable.

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<sup>3</sup> Bergstrom et al. 2021 Combating ecosystem collapse from the tropics to the Antarctic. *Global Change Biology*. <https://doi.org/10.1111/gcb.15539>

<sup>4</sup> Saniotis et al 2015, Building community resilience to heatwaves in South Australia. *Transactions of the Royal Society of South Australia*, <https://doi.org/10.1080/03721426.2015.1035220>

<sup>5</sup> Chang, J. et al. 2021 Climate warming from managed grasslands cancels the cooling effect of carbon sinks in sparsely grazed and natural grasslands. *Nat Communications* <https://doi.org/10.1038/s41467-020-20406-7>

<sup>6</sup> <https://data.environment.sa.gov.au/Content/Publications/Climate-Change-Science-and-Knowledge-Plan.pdf>

*5(d) to provide for a risk-based assessment of land capacity based on scientific principles using a variety of information sources, including technology*

The removal of both scientific knowledge from the Pastoral board and funding for science from the Pastoral Land Management Fund (see below) reduces the likelihood of this object being achieved.

### **Part 3 – Administration**

#### **Division 2 – The Board**

The previously strong advisory role played by scientists on the board has been removed. Under the *Pastoral Land Management and Conservation Act 1989* the role of members with a “wide knowledge of the ecology, and experience in the management of the pastoral land of this state” and “experience in the field of land and soil conservation of pastoral land”

Have been replaced by:

A member with qualifications, knowledge or experience in (b) natural resource management and conservation of productive pastoral land.

Adequate knowledge of ecology and land and soil conservation is both more specific and more likely to require a scientific background than natural resource management of productive pastoral land.

Furthermore, the removal of a member nominated by the Conservation Council of South Australia disenfranchises the states’ conservation community in the management of our pastoral lands. Conservation science in South Australia’s pastoral lands is both long and distinguished. We also advise that in addition to retaining the current scientific expertise on The Board, expertise in climate change and sustainability science is also required.

#### **Division 2 – The Fund**

The allocation of money from the Pastoral Land Management Fund in the *Pastoral Land Management and Conservation Act 1989* for scientific activities under section 9 (5)

- (a) research into research into techniques for pastoral land management, for prevention or minimisation of pastoral land degradation and for rehabilitation of degraded pastoral land;
- (b) the publication of research findings and dissemination of information relating to those techniques;
- (c) experimentation with and practical development of those techniques;

These provisions have been removed from the Bill. Not only will this reduce the amount of research undertaken in the pastoral lands it will weaken South Australia’s scientific output through reduced publications and by not supporting range lands science. The removal of this support could see a reduction in the capacity to undertake such research and to our ability to manage pastoral lands under the impact of climate change.

The *Pastoral Lands Bill 2020* removal of science from the management of our pastoral lands is inconsistent with several other policies. The *Climate Change Science and Knowledge Plan for South Australia* states that:

“There is a need to understand how total grazing pressure and climate change will interact, and the implications this will have for ecosystems and pastoral stocking rates.” And “The ability to predict the response of vegetation to a plausible range of climate, land management and wildlife management scenarios will assist in the development of pastoral, land and wildlife management strategies, including business planning for pastoral enterprises.”

Meeting these requirements will require much greater scientific endeavour than has been undertaken in the past. Thus, whilst the Government of South Australia recognises the impact of climate change on our pastoral regions and the need for research to guide management, this is not reflected in the *Pastoral Lands Bill 2020*.

We do not support the *Pastoral Lands Bill 2020* and recommend an expansion of the role science plays in managing our pastoral lands as detailed above, rather than its removal.

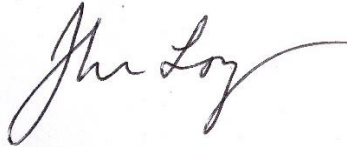
Yours Sincerely,



Prof Sabine Dittmann  
(President 2019-Present)



Dr Alice Clement  
(Programme Secretary)



Prof John A. Long  
(President 2016-2019, Past President)



Assoc. Prof. Gunnar Keppel  
(Councillor)



Prof Craig R. Williams  
(President 2012-2014)



Assoc. Prof. Luke Mosley  
(Councillor)



Dr Nicholas John Souter  
(President 2010-2012, Councillor)



Prof Robert W. Fitzpatrick  
(President 2004-2006)



Priya  
(Councillor)



Mr Peter Hudson  
(Councillor)

Mr Kim Critchley (Secretary)



Dr Wayne Harvey FAICD (Treasurer)



Assoc. Prof. Trevor H Worthy  
(Editor, Transactions of the Royal Society  
of SA)

Cc: Hon. Steven Marshall, Premier, Unit 2, 90-94 The Parade, Norwood, SA, 5067  
Hon. David Speirs, Minister for Environment and Water, PO Box 121, Brighton, SA, 5048  
Hon. David Pisoni, Minister for Innovation and Skills, 372 Unley Road, Unley Park SA 5061  
Mr Peter Malinauskas, Leader of the Opposition, 488 Port Road, Welland, SA 5007  
Hon. Tammy Franks, c/- Parliament House, Adelaide, 5000  
Hon. John Darley, c/- Parliament House, Adelaide, 5000  
Hon. Frank Pangallo, c/- Parliament House, Adelaide, 5000  
Professor Caroline McMillen, Chief Scientist for South Australia,  
Caroline.McMillen@unisa.edu.au