Nature Conservation Society of South Australia

5 Milner Street,
Hindmarsh SA 5007

Phone: (08) 7127 4630
Fax: (08) 8231 9773

Website:
www.ncssa.asn.au

Department for Environment and Water
National Parks and Wildlife Service SA
Fire Management Branch
GPO Box 1047
Adelaide, SA 5001
Submitted via: DEWFireManagement@sa.gov.au

Monday 7th August 2023

Re: Submission on the Draft Parks of Kangaroo Island Fire Management Plan

To whom it may concern,

The Nature Conservation Society of South Australia (NCSSA) is writing to provide feedback on the Department for Environment and Water's *Draft Parks of Kangaroo Island Fire Management Plan*.

Since 1962, the NCSSA has been a strong advocate for the protection of nature, with particular emphasis on nationally and state-listed threatened plants, animals and ecological communities, and the management of protected areas.

NCSSA's feedback focuses on the following aspects of the proposal:

- clearing extensive fire trails and fire breaks through areas of National Park and Wilderness Protection Area, *and*
- expanding the program of prescribed burns into large areas of native habitat that are currently exposed only to wildfire.

NCSSA notes that DEW is seeking feedback primarily in questionnaire form, but also welcomes submissions which will be considered outside of the planning consultation.

NCSSA's experience with Kangaroo Island conservation & fire management

NCCSA has a long history of monitoring and conserving Kangaroo Island's unique flora and wildlife, and advocating for their protection.

NCSSA campaigned for the Gosse Crown Lands to be added to Flinders Chase National Park in the 1980s, supported the first field survey of the endangered Kangaroo Island Dunnart in the 1990s, and over the last few years has fought for ongoing protection of Flinders Chase National Park against encroaching development.

NCSSA has taken a ***leading role in conservation projects following the 2019–2020 bushfires***, including:

- field surveys to map surviving populations of the Island's threatened endemic plants, and actions to protect them;
- co-leading the development of a community-based native seed garden to propagate threatened plants for revegetation projects;

- mapping and removal of Tasmanian Blue Gum seedlings that escaped from plantations into National Parks and other areas of native vegetation after the fires; *and*
- co-leading a recent review of biodiversity monitoring methods in Flinders Chase National Park and the Ravine des Casoars Wilderness Protection Area, leading to a long-term biodiversity monitoring framework.

NCSSA also recently completed a ***major consultative project on bushfire management and resilience on Kangaroo Island****, Fleurieu Peninsula, and Adelaide Hills*.

This submission therefore draws on a deep understanding of the Island's fire history and ecology, community concern about fire risk, and knowledge of the issues and scientific foundations underpinning current and emerging fire-management practices in South Australia and beyond.

NCSSA's position

NCSSA acknowledges the traumatic experiences of Kangaroo Island's residents and fire managers affected by the 2019–2020 bushfires and their aftermath, and DEW's desire to take action to prevent future similar disasters.

However, the NCSSA considers that the proposed plan will cause irreversible harm to Kangaroo Island's outstanding natural values, and, based on available information, is unlikely to have the desired effect of protecting the Island's community from future bushfire hazards. The NCSSA therefore calls for a radical rethink of methods used to manage fire and its impacts on communities on Kangaroo Island.

Publicly available modelling of prescribed burning scenarios for Kangaroo Island does not support intensification of prescribed burns for asset protection or to protect human lives, and shows it is likely to pose significant harm to the Island's biodiversity because overall, more habitat would be burnt more often.[1]

NCSSA calls on DEW to implement scientifically robust fire management on the Island, and for modelling used to justify the proposed fire management regime to be released for public discussion.

Topics in this submission

- Clearing new fire trails and fire breaks through areas of high-quality native vegetation
- Prescribed burning in areas of native vegetation not previously managed in this way
- Likely effects on biodiversity

Impacts of new fire trails & fire breaks

The draft plan proposes to clear extensive fire trails and fire breaks, through and around various parks and the Ravine des Casoars Wilderness Protection Area (WPA).

To minimise new impacts on habitat, some trails/breaks follow previously cleared lines bulldozed during the 2019–2020 bushfires. Although this is better than cutting completely new tracks, NCSSA expresses deep concern about their permanence and ongoing use, which greatly magnifies their negative impacts.

The new trails and fire breaks represent significant permanent losses of habitat, and undesirable fragmentation of the landscape. This is contrary to the Federal Government's *Strategy for Nature,*[2] which promotes the '*retention, protection and/or restoration of landscape-scale, native vegetation corridors*'. Carving up large areas of native vegetation with cleared trails, causing fragmentation, is the opposite of promoting connectivity.

[1] Marshall, E., Kultaev, D., McColl-Gausden, S., Filkov, A., Penman, T. (2021). Fire risk modelling for Kangaroo Island, Black Summer 2019–20 fires. Bushfire & Natural Hazards Cooperative Research Centre, University of Melbourne. https://www.naturalhazards.com.au/resources/publications/report/fire-risk-modelling-kangaroo-island

[2] DCCEEW. (2022). *Objectives*. Australia's Nature Hub. https://www.australiasnaturehub.gov.au/national-strategy/objectives

Misleading mapping

Based on previous feedback received from DEW, NCSSA had understood that the proposed new fire trails on western Kangaroo Island would be of a standard width. Under State Government guidelines[3], the standard width for a major fire track is 7 m. Width of the proposed fire tracks is not specified in the interactive map,[4] and someone viewing the map might assume them to be 7 m wide. However, NCSSA notes that some of the **proposed fire access tracks marked on the map are *also* fire *breaks***, and that the fire breaks are much wider than 7 m. These would, for example, cut swathes through and around the Wilderness Protection Area ranging between 12, 25, and 50 m wide.

Confusingly, these dual-purpose fire trails and fire breaks are overlaid one on top of the other on the interactive map, and despite representing the same cleared trail, are given two different Unique IDs (e.g. the fire access track RADE_FA03 through Ravine des Casoars WPA is the same as fuel break RADE_FB07).

Even worse, the map symbols used to represent these two features obscure the existence and the magnitude of the wide fire breaks. New fire access tracks are represented by highly visible, thick, dotted purple lines (Figure 1, left image). Viewers may assume these to be 7 m wide. When the fire access tracks are toggled off, the fuel breaks of 12 and 25 m wide, which follow exactly the same lines as the thick purple dotted lines in the left image, remain – but are represented by a barely perceptible pink line on the map (Figure 1, right image). These could be missed entirely by the viewer. This is extremely misleading and has the effect of minimising these wide firebreaks and the impact they will have on the Wilderness Protection Area.

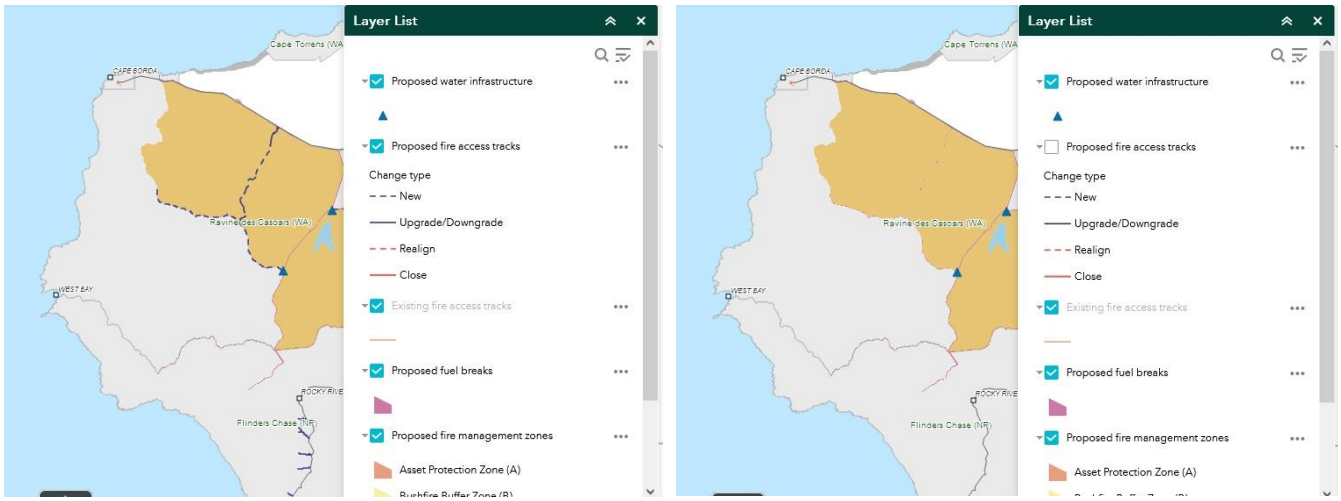

Figure 1: *Symbols used to mark new fire access tracks (left) and fire breaks (right) through the Ravine des Casoars Wilderness Protection Area. Note that the fire breaks follow the same line as the fire access tracks, but are nearly invisible on the map.*

Habitat loss & land degradation

The proposed fire trails and fire breaks will result in direct and permanent loss of native vegetation through track clearing, and will facilitate significant new impacts (controlled burns and fuel reduction) over a much larger area.

The status quo would mean irregular, periodic burning of native habitats via bushfires. The proposed changes to fire management guarantee there will be ***regular burning PLUS additional habitat loss and degradation.***

[3] State Bushfire Coordination Committee (2015). South Australian firebreaks, fire access tracks and sign standards guidelines.

[4] https://sagov-env.maps.arcgis.com/apps/webappviewer/index.html?id=4b04aab54d15418a9263d396db06f435

Cleared tracks will be susceptible to **erosion**, increasing the risk of land degradation in the surrounding landscape. This risk is likely to increase over time; climate change modelling predicts that although Kangaroo Island will have decreased rainfall overall in coming decades, it will also be subject to increased extreme rainfall events.[5]

Spread of Phytophthora – a Key Threatening Process

Phytophthora cinnamomi (often abbreviated to Pc) is an introduced micro-organism that kills susceptible native plants. It is spread in contaminated soil, especially in wetter habitats, by vehicles, tools, and shoes. Once established, there is no known method of eradication.

Under the *Environment Protection and Biodiversity Conservation Act 1999*, plant dieback caused by *Phytophthora* is recognised as a Key Threatening Process that places native species and habitats at risk of extinction or degradation.[6] The Federal Threat Abatement Plan for *Phytophthora* identifies fire-fighting and road construction activities as ways in which it can be spread, and *Phytophthora* is a recognised threat to several threatened plants that occur in the Ravine des Casoars area.[7]

Phytophthora has been present on Kangaroo Island since the 1990s, but it has so far had minimal impact in the Ravine des Casoars area, which is largely inaccessible to vehicles/pedestrians. Ongoing access to the centre of the WPA by vehicles and fire crews greatly increases the risk of *Phytophthora* spreading within currently pristine habitat.

Protocols exist for minimising its spread, such as regular cleaning and disinfection of vehicles and footwear, especially when moving between different properties. However, there is a high risk of these protocols not being observed during fire-fighting activities, including controlled burns. Prescribed burns would be an especially high risk for spreading *Phytophthora* as these must take place during wetter months, when *Phytophthora* spores are most easily spread in mud.

'Edge effects' that will degrade intact native habitats

Edge effects are any negative effects on a habitat that occur along boundaries with roads or other cleared areas. Cutting a new track through the middle of previously inaccessible habitat such as the Ravine des Casoars Wilderness Protection Area creates a new avenue for introducing and spreading threats through the centre of the habitat.

In addition to the threat of *Phytophthora* spread (see above), edge effects that are likely to result from clearing new trails/breaks on Kangaroo Island include:

- **Spread of invasive weeds** into native bushland where few currently occur, threatening native species and degrading habitat quality;
- Providing **corridors for the movement of feral animals** such as cats and pigs (both are Key Threatening Processes under the EPBC Act, 1999[8]), putting at risk endangered species such as the Kangaroo Island Dunnart and Southern-Brown Bandicoot;

[5] DEW. (2022). *Guide to Climate Projections for Risk Assessment and Planning in South Australia 2022*. Government of South Australia.

[6] https://www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl

[7] https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/threat-abatement-plan-disease-natural-ecosystems-caused-phytophthora-cinnamomi-2018

[8] https://www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl

- **Attracting edge-dwelling herbivores** like grey kangaroos, which will then be able to graze previously inaccessible vegetation and may require control to prevent habitat degradation. New plant growth after prescribed burns is especially likely to attract kangaroo grazing.

Prescribed burning

The proposed plan aims to initiate prescribed burning regimes across large areas of intact (i.e. uncleared) habitat on the western end of Kangaroo Island, where no burning has been intentionally carried out for probably thousands of years. This is a profound management change not to be made lightly. NCSSA has not seen evidence to support this, and contrary evidence is in the public domain.

Modelling carried out by the Bushfires and Natural Hazards Research Cooperative Research Centre[9] following the 2019–2020 bushfires shows that an intensification of prescribed burning on Kangaroo Island would have virtually no benefit to community safety, and would harm biodiversity. It would result in a greater area of habitat within the landscape being burned overall (including prescribed burns and wildfires) than if controlled burns were not practiced. More habitat would be burnt sooner than the Minimum Tolerable Fire Interval, effectively destroying habitat integrity and endangering flora and fauna.

The proposed plan is framed as serving the dual purposes of conservation and asset protection. In both respects NCSSA believes it is fundamentally flawed, and better ways of managing bushfire risk on the Island without compromising conservation need to be examined urgently.

Conservation impacts of mosaic burning

The NCSSA understands that new fire trails and fire breaks are proposed within large tracts of wilderness area at the western end of Kangaroo Island because this region has burnt most frequently over the last 90 years (see heat map in Figure 2). The proposed prescribed burns, backburning and fire breaks aim to limit the spread of bushfires when these occur, containing them to limited areas of these high-value habitat areas.

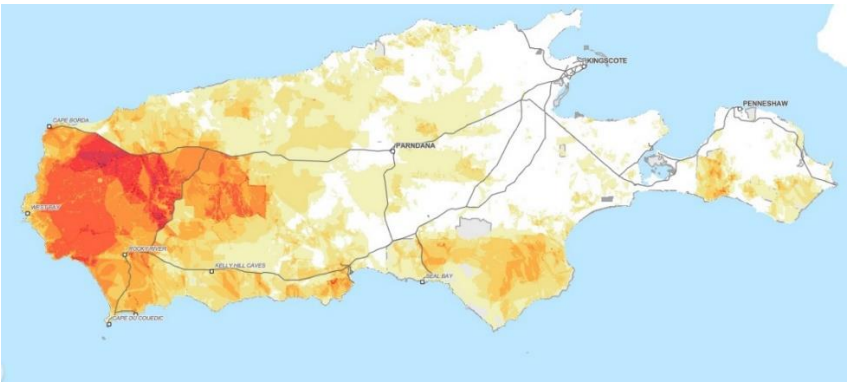

Figure 2: *Fire frequency map of Kangaroo Island (1930s to present) (from https://storymaps.arcgis.com/stories/fa6eb7504c6e4c21b8470c41a1d71e78)*

However, the NCSSA observes that, despite having burnt more frequently than other areas over the last century, the wilderness areas and National Parks of western Kangaroo Island retain high biodiversity – and contends that this is specifically *because* these are large areas of intact habitat, with high potential for natural recovery and recolonisation by wildlife after fire.

[9] Marshall, E., Kultaev, D., McColl-Gausden, S., Filkov, A., Penman, T. (2021). Fire risk modelling for Kangaroo Island, Black Summer 2019–20 fires. Bushfire & Natural Hazards Cooperative Research Centre, University of Melbourne. https://www.naturalhazards.com.au/resources/publications/report/fire-risk-modelling-kangaroo-island

The plan implies that creating a mosaic of different age classes of vegetation using prescribed burns will benefit biodiversity. This is based on outdated assumptions that are not supported by sound evidence.

The NCSSA is aware of the long-standing assumption that deliberately creating a network of habitat patches of different post-fire ages with different structures will result in more diverse habitat that can support more species across the landscape. However, a recent, comprehensive evidence review shows that it is not necessarily the case – biodiversity responses to fire mosaics vary greatly.[10]

For example, a study of the effects of mosaic burning on plants, lizards, and mammals found no clear benefit to biodiversity.[11] Various studies have shown that a mosaic of fire ages is not in itself beneficial to wildlife but highlight the value of retaining long-unburnt habitat patches within the landscape.[12,13,14]

Regular prescribed burns that aim to reduce fine fuels (e.g. leaf litter) have been shown to have profound effects on the composition of invertebrate communities[15], which would be expected to have knock-on effects to other species, especially woodland birds.[16]

All fires create heterogeneity within the landscape, and it has been observed that if creating heterogeneity becomes a goal in its own right, any burning regime could theoretically be justified, regardless of its actual effects.[17]

It is therefore vital to determine what the effects of a *specific* fire management regime would be on the unique native species and habitats of Kangaroo Island, rather than apply a blanket assumption that patch burning is beneficial for biodiversity in any landscape.

Retention of long-unburnt habitat patches

NCSSA supports the draft plan's aim to protect long-unburnt areas of habitat (RADE_E01, RADE_E03) within the Ravine des Casoars WPA from fire, as the value of long-unburnt areas for biodiversity is well-supported by scientific evidence.

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[10] Jones, G. M., & Tingley, M. W. (2022). Pyrodiversity and biodiversity: A history, synthesis, and outlook. *Diversity and Distributions*, *28*(3), 386–403. https://doi.org/10.1111/ddi.13280

[11] Pastro, L. A., Dickman, C. R., & Letnic, M. (2011). Burning for biodiversity or burning biodiversity? Prescribed burn vs. wildfire impacts on plants, lizards, and mammals. *Ecological Applications*, *21*(8), 3238–3253. https://doi.org/10.1890/10-2351.1

[12] Taylor, R. S., Watson, S. J., Nimmo, D. G., Kelly, L. T., Bennett, A. F., & Clarke, M. F. (2012). Landscape-scale effects of fire on bird assemblages: Does pyrodiversity beget biodiversity?: Landscape-scale influence of pyrodiversity on birds. *Diversity and Distributions*, *18*(5), 519–529. https://doi.org/10.1111/j.1472-4642.2011.00842.x

[13] Woinarski, J., Cripps, J., Durkin, L., Law, B., Legge, S., Macak, P., Nelson, J., & Rumpff, L. (2023). Impacts of the 2019–20 wildfires on native mammals. In *Australia's Megafires: Biodiversity Impacts and Lessons from 2019-2020: Vol. Chapter 16*. CSIRO Publishing. https://doi.org/10.1071/9781486316656

[14] Davis, R. A., & Doherty, T. S. (2015). Rapid Recovery of an Urban Remnant Reptile Community following Summer Wildfire. *PLOS ONE*, *10*(5), e0127925. https://doi.org/10.1371/journal.pone.0127925

[15] Gill, A. M., Woinarski, J., & York, A. (1999). *Australia's biodiversity-responses to fire: Plants, birds, and invertebrates: Vol. Biodiversity Technical Paper, No. 1*. Dept. of the Environment and Heritage.

[16] Prowse, T. A. A., Collard, S. J., Blackwood, A., O'Connor, P. J., Delean, S., Barnes, M., Cassey, P., & Possingham, H. P. (2017). Prescribed burning impacts avian diversity and disadvantages woodland-specialist birds unless long-unburnt habitat is retained. *Biological Conservation*, *215*, 268–276. https://doi.org/10.1016/j.biocon.2017.09.005

[17] Taylor, R. S., Watson, S. J., Nimmo, D. G., Kelly, L. T., Bennett, A. F., & Clarke, M. F. (2012). Landscape-scale effects of fire on bird assemblages: Does pyrodiversity beget biodiversity?: Landscape-scale influence of pyrodiversity on birds. *Diversity and Distributions*, *18*(5), 519–529. https://doi.org/10.1111/j.1472-4642.2011.00842.x

However, detail is lacking about the length of time that areas RADE_E01 and RADE_E03 will be protected. The proposed regime for these exclusion zones is only described as 'Exclusion of prescribed fire for ***a period of time***' [emphasis added]. There may be an underlying assumption that these patches will also need be burnt at an unspecified future date. If so, this should be explicitly stated and justified with evidence.

Asset protection

The effectiveness of the proposed plan for protecting Kangaroo Island's communities from future bushfire risk is highly questionable. The proposed changes significantly increase the scope for fire managers to conduct prescribed fuel-reduction burns on the Island, but this may not be effective or feasible, especially in the longer term.

Prescribed burns have become ubiquitous in many parts of Australia, but evidence for their effectiveness is questionable, and certainly not uniform across all landscapes.[18] Some contend that prescribed burning is a vicious circle that creates dense, flammable regrowth that then requires further burning to manage.[19] Introducing prescribed burns at a landscape scale to areas of western Kangaroo Island may result in a vicious cycle of increased flammability.

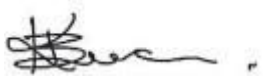
Climate change introduces further challenges into this system of land-management. A recent study that modelled bushfire conditions for the 2019–2020 fire season found that prescribed burns played a modest role in reducing bushfire risk, but benefits were dwarfed by the effects of extreme weather conditions.[20] In other words, under projected climate change with more frequent extreme fire weather, prescribed burns are unlikely to prevent future catastrophic fires seasons such as 2019–2020. NCSSA understands the impulse to try to prevent future large-scale bushfire emergencies, but intensifying prescribed burns in response to calls to mitigate future disasters may offer little more than a placebo.

Even if there were sound evidence that prescribed burns would reduce bushfire risk on Kangaroo Island, it is acknowledged to be increasingly difficult to implement them Australia-wide due to climate change: hotter, drier conditions and longer fire seasons mean that there are a diminishing number of days per year when it is possible to conduct controlled burns without losing control of fires.

If the planned burns cannot safely be delivered the longer term, then clearing new fire trails through intact bushland is essentially pointless habitat destruction. NCSSA calls for a radical rethink of methods used to manage fire and its impacts on communities on Kangaroo Island.

If you would like to clarify or discuss this submission please contact me on 0431 448 133, or via email at kirsty.bevan@ncssa.asn.au.

Yours sincerely,



Kirsty Bevan
CEO

[18] Campbell, T., Bradshaw, S. D., Dixon, K. W., & Zylstra, P. (2022). Wildfire risk management across diverse bioregions in a changing climate. *Geomatics, Natural Hazards and Risk*, *13*(1), 2405–2424. https://doi.org/10.1080/19475705.2022.2119891

[19] Zylstra PJ, Bradshaw SDA, Lindenmayer DB. 2022. Self-thinning forest understoreys reduce wildfire risk, even in a warming climate. Environ Res Lett. 17(4):044022. https://doi.org/10.1088/1748-9326/ac5c10.

[20] Clarke, H., Cirulis, B., Penman, T., Price, O., Boer, M. M., & Bradstock, R. (2022). The 2019–2020 Australian forest fires are a harbinger of decreased prescribed burning effectiveness under rising extreme conditions. *Scientific Reports*, *12*(1), 11871. https://doi.org/10.1038/s41598-022-15262-y