

PO Box 3276
Victoria Gardens
Richmond, Vic 3121

Phone : (03) 9428 4709

info@australianbrumbyalliance.org.au
www.australianbrumbyalliance.org.au

ABN : 90784718191

27-Nov-2019

Australian Brumby Alliance Inc

Submission to the Victorian Parliamentary inquiry

launched 28-Nov-2019 to review progress on the 2016 Auditor-General audit report on Victorian Wetlands meeting Obligations to Protect Ramsar Wetlands

Issued 28 October 2019 https://www.parliament.vic.gov.au/file_uploads/Auditor-General_-_Meeting_Obligations_to_Protect_Ramsar_Wetlands_mmyx7jcp.pdf (includes Barmah)

Thank you for the opportunity to give feedback to the Parliamentary Inquiry launched 28th Nov 2019. The experience of the Australian Brumby Alliance (ABA) with Parks Victoria suggests the issues found in the Auditor-General's 2016 report on Victoria's obligation to protect Ramsar wetlands (the 2016 AG Report), are not limited to Ramsar obligations, but can equally apply systemically across habitats managed by Parks Victoria.

This report is structured as follows:

- 1. Introduction**
- 2. Auditor-General's 2016 Report**
- 3. Areas of Significant Concern**
 - a) PV's Inability to evaluate actions to inform and improve further planning
 - b) PV's contradictory position on altered stream flows
 - c) PV's adaptive management & trends fail to provide baseline data
 - d) PV's inaction on changes outside natural variations
 - e) PV's inconsistencies and contradictory views on current wetland marsh health
 - f) PV's inability to recognise and act on emerging threats
- 4. ABA Context**
- 5. ABA summary of Parks Victoria's approach to Barmah's wetland management**
- 6. ABA observations for future Barmah's wetland marshes management**

1. Introduction

The ABA supports the Auditor-General's concerns expressed in his 2016 report investigating the Department of *Environment, Land, Water & Planning (DELWP)*, primary site managers; *Parks Victoria (PV)* and *Melbourne Water (MW)* —as well as the *Catchment Management Authorities (CMA)* which also have a key management role. In particular, we highlight the following examples of concerns the ABA has observed for the past 5 years in particular.

- a) PV's Inability to evaluate actions to inform and improve further planning
- b) PV's contradictory position on altered stream flows
- c) PV's adaptive management & trends fail to provide baseline data
- d) PV's inaction on changes outside natural variations
- e) PV's inconsistencies and contradictory views on current wetland marsh health
- f) PV's inability to recognise and act on emerging threats

To illustrate our concerns regarding PV's current management issues in the following pages, we have referenced the following three draft plans:

1. River Red Gum Parks, Draft Management Plan, June 2017 (PV RRG-MP 2017 Draft).
2. Strategic Action Plan, Protection of Floodplain Marshes , Barmah National Park and Barmah Forest Ramsar Site 2019 – 2023 (Draft) (PV BNP-SAP 2019 Draft).
3. Draft Joint Management Plan for Barmah National Park, Yorta Yorta Traditional Owner Land Management Board 2019 (YYTOLMB-JMP 2019 Draft) which primarily references the actions outlined in PV BNP-SAP 2019 Draft report.

2. Auditor-General's 2016 Report

In addition, the ABA would like to see the comments in the **2016 AG Report** addressed by PV:

- **Page viii** states *"a lack of oversight and accountability and poor evaluation, compromised by limitations in data."*
- **Page xiii** "Parks Victoria does not monitor and report on the implementation of management plans for the 10 sites it manages and does not evaluate its actions."
- **Page x** states *"Ramsar Convention requires be developed to guide the maintenance and management..... and to set a baseline for measuring change"*
- **Page 19** states *"Parks Victoria has poor oversight activities are generally not guided by the current Ramsar management plan can result in significant ecological risks not being addressed in a timely way"*.
- **Page 29** states *"In 2013, Parks Victoria reviewed the status of its Ramsar management activities against Ramsar management plans prepared in 2002–03. This review consisted of telephone interviews with Parks Victoria staff about progress on actions..... it is not clear how it has helped further planning"*.

3. Areas of Significant Concern

a. PV's Inability to evaluate actions to inform and improve further planning

The ABA is concerned that PV do not have the rigor or processes in place to evaluate and deliver the changes needed to meet the requirements under the National Parks Act and other relevant Acts including meeting Obligations to Protect Ramsar Wetlands.

This has been evidenced in the 2016 AG Report. The ABA feels the concerns of the 2016 AG Report have still not been addressed, as evidenced by the PV's lacklustre plan content and little evidence of rigour in research, for example, in the following PV's draft plans:

1. PV RRG-MP 2017 Draft
2. PV BNP-SAP 2019 Draft
3. YYTOLMB-JMP 2019 Draft

b. PV's contradictory position on altered stream flows

PV RRG-MP 2017 Draft p-vii: *The development of river regulation, and irrigation infrastructure such as regulators, canals and levees, have drastically altered stream flows and flooding regimes on the floodplains, resulting in a decline in the health of the River Red Gum forests, streams and wetlands as well as species that depend on them for their continuing survival.*

However, PV RRG-MP 2017 Draft p-43 refer to using *infrastructure to divert water from river onto floodplains*, also p-viii sees positive use of regulators/levees *"This may include targeted planned burning and changes to flooding regimes through the use of regulators and levees"*.

PV RRG-MP 2017 Draft page viii states *"frequency, timing, duration and depth of flooding are critical for the health of River Red Gum forests and many other ecosystems in the River Red Gum Parks*. But PV's statement lacks transparency as despite the critical health needs 'environmental' floods (under the current regime) will continue to occur in the non-growth season and as previously has occurred, increases risks of toxic black water, fish deaths etc.

c. PV's adaptive management & trends fail to provide baseline data

We have seen several PV plans with an emerging pattern of Acts/protocols to adhere to, people to communicate with, partnerships, the area's significance, natural values, cultural heritage significance, tourism benefits, zoning, PV's vision and great photographs. However, these often very wordy aspects of PV's management plans, appear to lack specific actions, timelines and data capture that would ensure quantitative and qualitative outcomes can be monitored and evaluated to inform future PV recommendations.

PV RRG-MP 2017 Draft p-4 talks of *adaptive management being an integral part of planning to enable evidence-based decisions*. If so, what did PV learn from the VEAC's River Red Gum Forests Investigation, Final Report 2008 that PV refer to in the PV RRG draft p-xi, or PV's

[engagement panel/plan 2008 p-124?](#) Did the 2008 plans report evidence-based decisions or baseline data that could be used to *enable* future plans to better target their actions?

In fact, due to the lack of robust published research, the ABA has commissioned a multi-year research program to analyse the distribution, population density, social behaviour and genetics of the Brumbies in the Eastern Victorian Alpine region. This research is being conducted by Dr David Berman, Adjunct Research Fellow (Wildlife Ecology), University of Southern Queensland. An aim of this research is to provide a method of determining the positive/negative impacts of Brumbies related to population density levels.

d. PV's inaction on changes outside natural variations

In the late 1800s/early 1900s, Barmah Forest visitors marvelled at extensive 'emerald green' treeless grassy plains, dominated by highly productive semi-aquatic Moira Grass that provides important habitat for fauna, including colonially-nesting waterbirds. (Vivian 1913)

From 1845 to 1860 Barmah Forest contained four squatting runs and was intensively grazed by sheep and cattle (Fahey, 1986). Logging also continued well past the time when RAMSAR listed Barmah Forest as a wetland of significance in 1982.

[PV RRG-MP 2017 Draft p-7](#) lists **4 trends** in waterway & floodplain values, ecological character, meeting hydrological water requirements & aquatic health PV will monitor as **Key measures for park goals**. How is it possible for PV's *trends* to translate to action orientated outcomes without baseline data?

The increasing degradation to Barmah's wetland marshes is not a new concept; the ongoing decline of Barmah's area has been well documented over several decades, for example:

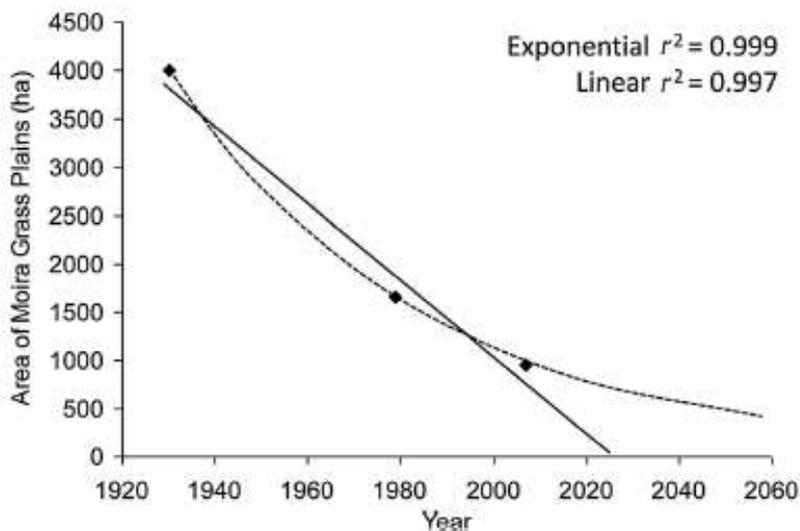
- Longer-term significant ecological changes in Moira Grass plains first became apparent leading to substantial extinction of this interesting ecosystem (Chesterfield 1984).
- Hypoxic black- water events are an irregular but recurring feature in the Murray River and its tributaries, with five events recorded downstream of Barmah-Millewa Forest since 1990 (i.e. 1992, 2001, 2005, 2010/11 and 2012). River regulation is believed to have exacerbated the frequency and magnitude of hypoxic blackwater events through a greater accumulation of organic material on floodplains resulting from decreased flooding frequency, and altering flow seasonality that has increased the likelihood of inundation during warm periods (Whitworth et al. 2012).
- Regulation of the river since the first filling of Hume Dam in 1934 has caused a reduction in the frequency of flows associated with partial flooding and an increase in the occurrence of small summer floods. Areas with a high flood frequency were most affected. It is possible that the forest may change to types associated with reduced duration of inundation in the long-term unless ameliorative action is taken. (Bren 1988)

- Review of Environmental Impacts of Flow Regulation and Other Water Resource Developments in the River Murray and Lower Darling River System (Final Report 2002) https://www.mdba.gov.au/sites/default/files/archived/mdbc-tlm-reports/2105_Review_of_env_impacts_of_flow_regulation_2002.pdf
- A 1914 vegetation map (Leslie, 1995; his Figure 2.2) shows extensive grass plains at Moira Lake. The area is now rushland). (cited in Colloff et al 2014)

PV's BNP-SAP 2019 draft p-15 (Graph) states *the LAC has clearly been far exceeded with a loss of 88% of the Moira grass extent since listing.*

From vegetation maps (DPI, 2009) it was estimated that by 2007 the area had shrunk to only 947 ha (3.2%): a loss of 79% (3160 ha) in 77 years, and a projected local near-extinction of aquatic grasslands between 2026 and 2060 under continued altered flows. (Colloff 2014)

See PV's BNP-SAP 2019 graph below:



Graph - Rate of loss of Moira grass plains at Barmah Forest, based on historical measures of extent (Colloff et al. 2014) - (that) without management intervention (PV define as *retaining the status quo*) shows Moira grass extinction as early as **2026** which is contrary to Colloff's words below.

Colloff 2014 states *in 1945, giant rush around Moira and Barmah Lakes occupied only 1 ha according to vegetation maps from aerial photographs (DPI, 2009). There was slight increase following the 1956 floods but **major expansion** (of giant rush) **after 1985**, coinciding with an increase in frequency of summer rainfall rejection flooding (Chong & Ladson, 2003).*

PV insists Barmah Brumbies, not altered flood regimes are the primary culprit, however the Australian Brumby Alliance Inc. (ABA) who advocate for the recognition, management, preservation and welfare of Wild Horses in areas they have lived for over 150 years, is highly concerned that PV, for years have ignored the longstanding, increasing damage inflicted on Barmah's wetlands we have previously highlighted. Instead, PV insist that Barmah's Moira grass cannot recover until all horses are gone (PV BNP-SAP 2019 Draft).

We are highly concerned that a government agency can continually avoid scrutiny or even be questioned, without answers, on the use of such illogical, denial tactics.

The ABA's submissions to PV's horse management plans, has sited many (non PV) historic and recent scientific reports detailing that the primary cause of damage to Barmah's wetlands is the altered flooding regime, damage that was first highlighted as early as 1920's **due to dams** construction **upstream from Barmah** Forest.

e. PV's inconsistencies and contradictory views on current wetland marsh health

PV's Strategic Action Plan (SAP), Protection of Floodplain Marshes, Barmah National Park & Barmah Forest Ramsar Site 2019 Draft (PV's 2019 SAP draft)

Page1 - Principal factors likely to have contributed to the decline in Moira grass extent are:

1. Changes to the natural flooding regime due to river regulation
2. Grazing and trampling pressure by introduced animals, particularly by feral horses (and previously, cattle) [ABA note, no mentions of pigs, deer, goats, sheep etc]
3. Encroachment by invasive plant species (page1)

ABA's reply is that the primary cause of decline of the Moira grass have been shown by many studies to be the direct result of river regulation to harness the Snowies water for agriculture. Grazing and Barmah's horses have been there in much larger numbers since long before changes that have arisen following river regulation began to be observed.

PV RRG-MP 2017 Draft p-19 states *The Red Gum forests, woodlands, wetlands and waterways are recovering from decades of insufficient flooding and severe stress, and*
PV RRG-MP 2017 Draft p-37 states *Environmental flows, restored and delivered maintain and improve the health of the parks, and vegetation communities and fauna they support.*

What measurements do PV use to support words on p-19 *recovery* and p-37 *Environmental flows, restored and delivered*? Where is the recovery evidenced? Barmah, for example has just continued to decline based on verbal history and photos over the past few decades.

PV BNP-SAP 2019 Draft p1 - Current water management practices *aim to help mitigate* risks to Moira grass plains, and "feral horses are currently considered most destructive (of all introduced species present) and their removal from Barmah Forest is an immediate priority for action".

To the ABA it seems by PV using the words *aim to help mitigate the risks to Moira grass* is to infer on one hand *current water management practices* are now increasing Moira grassland coverage, but according to PV's SAP p-1, if Barmah's Brumbies remain, nothing will improve.

PV BNP-SAP 2019 Draft p-23 states that *Colloff et al. 2014 suggest that grazing by horses damages and uproots plants, decreasing plant density and thereby reducing capacity for regeneration when re-flooded, and that complementary actions such as management of grazing pressure, are also required in addition to the delivery of environmental flows.*

But PV only paraphrased Colloff. The **full** Colloff 2014's paragraph states "**Complementary management actions include management of grazing pressure and control of invasive plants, but provision of a flood regime that most closely matches plant-specific water requirements, at least for most of the time, represents the single management action that holds the best prospect for conservation and management of grassy wetlands.**"

PV BNP-SAP 2019 Draft p-39 state that one of the Conservation strategies is *continued environmental water management to restore key components of the flood regime*, and another for PV is to *address unseasonal inundation and delivery constraints*.

Yet PV's BNP-SAP p-39 strategy *address unseasonal inundation and delivery constraints* cannot happen since the same draft p 24 " *the 15,000 ML/d constraint will remain in place into the near future*", and PV's graph (p 15) showing Moira grass extinction as early as 2026.

PV BNP-SAP 2019 Draft p-53 "monitoring to track the status of Ramsar ecological values addressed by this plan" and to "Extent & cover of Moira grass to increase (from now) by 60% by 2028."

Still no talk of how vital it is to correct the flood regime. Interesting the monitoring goes to 2028, 2 years after PV's SAP p-15 chart shows the grass may disappear totally by 2026.

PV BNP-SAP 2019 Draft p-54 states that "Insights gained from monitoring programs will help to evaluate and improve management effectiveness, as well as identify where changes in the approach or resourcing are needed."

This infers a lack of knowledge from the past 4 decades of research which state that unless the flood regime is corrected, the grass will disappear as current flood regimes encourage conditions for red gums saplings and giant rush to take over the remaining Moira grass.

The Draft Joint Management Plan (JMP) for Barmah National Park requires – submissions (be made) to the Yorta Yorta TOLM Board by 6 October 2019. (YYTOLMB -JMP 2019 Draft)

In the Joint Management Plan JMP, the YYTOLMB are joint managers with parks Victoria, the Department of Environment, Land, Water and Planning (DELWP) and Goulburn Broken Catchment Management Authority (GBCMA), but the YYTOLMB-JMP plan does not list on the plan, page 3; Melbourne Water (MW) and Catchment Management Authorities (CMA).

The ABA attended all three YYTOLMB-JMP plan community consultation meetings in Shepparton, Barmah and Echuca and spoke with representatives from PV, DELWP, GBCMA, local Barmah Bangarang Aboriginal people and local non-Aboriginal Barmah people.

YYTOLMB-JMP 2019 Draft p-15 states Parks Victoria's *Protection of Floodplain Marshes Barmah National Park and Barmah Forest Ramsar Site Strategic Action Plan 2019–2023 (SAP), is of direct relevance a detailed analysis of Barmah's floodplain marshes.... and evaluation of threats and control methods needed to protect them (see Section 8 of this Plan), and*

YYTOLMB-JMP 2019 Draft p-29 states under strategies to “Reduce the impacts and restore the health of the floodplain marshes of the park **through** the implementation of the **(Parks Victoria BNP-SAP) Strategic Action Plan: Protection of Floodplain Marshes in Barmah National Park & Barmah Forest Ramsar Site (SAP) for the period 2019–2023.**”

The YYTOLMB-JMP 2019 Draft has embraced PV’s BNP-SAP draft, describing it “of direct relevance” and that the YYTOLMB-JMP 2019 Draft plan will use Parks Victoria’s – Strategic Action Plan for Barmah (PV’s BNP-SAP 2019) to reduce impacts and restore Barmah’s floodplain marshes. Please note our response to PV’s BNP-SAP 2019 Draft plan issues in this *ABA submission*.

The YYTOLMB-JMP 2019 Draft p-68 description of hydrology seems at variance with the non-PV scientific reports we referred to in PV’s BNP-SAP 2019 Draft; Protection of Floodplain Marshes in Barmah National Park & Barmah Forest Ramsar Site.

The limited description provided in the YYTOLMB-JMP Barmah plan suggests the YYTOLMB-JMP Barmah plan will also miss the key influencing factors of; incorrect seasonal flood timing, depth and frequency.

f. PV’s inability to recognise and act on emerging threats

PV BNP-SAP 2019 Draft p-25 state that *Other large herbivores present in the wetland system include eastern grey kangaroos and a range of introduced mammal species, including pigs, fallow and sambar deer, goats, feral sheep and rabbits (Ecology Australia 2013, 2017).*

Here PV does refer to grazing pressures from species (apart from horses) including eastern grey kangaroos pigs, fallow and sambar deer, goats, feral sheep and rabbits, which were we understand routinely culled before Barmah became a park. Barmah Brumbies that have grazed there for over 150 years represent a fraction of grazing pressure from other species.

At the recent Yorta Yorta plan community feedback forums; pig and deer numbers were said by PV to be too high to count, well into the 1,000s. Both pigs and deer uproot plants as they graze, while horses cut grass with sharp teeth leaving grass roots intact to regrow, yet PV focus on culling *all horses*, whilst only *reducing* pig and deer numbers.

PV BNP-SAP 2019 Draft p-48 states that in “2017-18 three targeted hunts occurred with 20 pigs killed” (in Barmah) and that 34 deer, 7 sheep, and 1 goat were also destroyed in the same period.

The ABA could support between 20-34 horses being removed annually.

A sow can have 2 litters of pigs a year (average litter size 7.5 pigs), therefore 1.5 sows will replace the 20 killed within 12 months in Barmah, surely a waste of taxpayers’ money as PV’s 2017/18 cull actions on a multibirth species numbering 1000s are of little consequence. Deer and goats are also multiple breeders, but Brumbies average only 2 births in 3 years.

4. ABA Context

In addressing the ABA areas of concern with the approach and operations of PV in managing Barmah's wild horse population we include examples of critical gaps in Brumby studies and ignored positive horse grazing studies (showing that correct horse density level is essential).

While Ramsar Convention requirements provide an appropriate reporting framework, the reports PV rely on must be based on comprehensive, robust, peer-reviewed research. The ABA so far has only seen scant, isolated, spatially limited studies that PV reply upon to claim all Brumbies must be culled. Scientific references to critical gaps in Brumby studies, include:

- We (Nimmo) agree with Linklater (2002) that the peer-review process is the best mechanism for illuminating the quality of research to the public, by exposing it to criticism from an independent and international audience. In the case of feral horse management, to our knowledge, this standard is yet to be achieved in Australia for both ecological and human dimensions research
- Critical gaps remain in our understanding of the ecological effects of feral horses on native environments, particularly for Australian ecosystems. (Nimmo 2007)...
- Rogers (1991), offered by Linklater (2000), show that positioning of horse exclosures can result in impact measurements unrepresentative of the broader system.
- Most research on the ecological effects of feral horses has occurred at single, small, spatial scales (Beever et al. 2003)
- research into effects of feral horses have typically included only a small number of response variables (Beever et al. 2003), usually measuring direct effects of disturbance on a few plant characteristics, ignoring both direct effects on other taxa (Beever and Brussard 2004) and indirect effects occurring concurrently and subsequently from the formation of feedback loops (Beever and Herrick 2006).

The ABA supports robust studies which compare horse densities in the range of areas where they have lived for 150-200 years that can identify the sustainable number of Brumbies the area can support and studies showing all impacts (positive & negative) from grazing.

Where transparent, objective studies find the positive impacts outweigh the negatives, at a given density, those horses, in our view, should be allowed to stay in situ, and be managed to the agreed, sustainable density level.

Appropriate Brumby management is highly contentious. To resolve such conflict the ABA has frequently asked PV to separate horse impacts from other grazing species in the same location. We also urged PV to identify both positive and negative impacts and appropriate horse density levels that result from robust, credible, transparent research.

PV to date have ignored studies with positive horse grazing results, studies such as;

- Zalba & Cozzani (2004) found intense grazing by feral horses resulted in increased predation on bird eggs in grasslands, leading to reduced avian richness and diversity. However, avian richness & diversity were higher in areas subject to moderate levels of grazing than areas in which horses had been excluded (Zalba and Cozzani 2004).
- Species richness and diversity are slightly greater in areas of moderate grazing than in enclosures - theory intermediate disturbance (Connell, 1978) (Willig et al 2018)
- <http://iopscience.iop.org/article/10.1088/1748-9326/11/11/113003>
 - Many studies just compare 'grazed' to 'ungrazed' conditions, grazing is not an all or nothing proposition – grazing *intensity* is most important.
 - plant diversity may be greater at a light or moderate level of grazing than with either grazing exclusion or heavy grazing.
- Grazing increased species diversity (Fahnestock & Detling 1999, Austrheim & Eriksson 2001, Fahnestock & Detling 2002, Ostermann-Kelm et al. 2009 & Stroh et al. 2012. -) and Lowers fuel levels thus fire severity, (Silvers 1993 and Davies et al. 2015), (all these references are cited in ITRG 2016)
- Grazing animals can have beneficial impacts on native plants and animals (Schultz 2011) and protect endangered plants (Gilfedder & Kirkpatrick 1994).

ABA summary of Parks Victoria's approach to Barmah's wetland management

The ABA fully supports the concerns expressed in the Auditor-General's 2016 audit report on Victorian Wetlands meeting Obligations to Protect Ramsar Wetlands.

It could be that issues identified in the 2016 audit report and our review suggest a deeper, entrenched focus PV have on internal priorities and beliefs, that may limit PV's ability to fully comprehend and respond appropriately to what is occurring under their stewardship.

- **The 2016 AG** report contains many examples of areas PV management could improve, such as PV's lack of *monitoring* and *reporting* on the *implementation of management plans* for the 10 sites it manages, and
- *does not evaluate its actions*", "*lack of oversight and accountability and poor evaluation, compromised by limitations in data.*" and that as a result *it is not clear how it has helped PV's further planning.*

The ABA's submission to the Parliamentary review has framed its concerns around PV's management of Barmah's wetland marshes and its Ramsar responsibilities and the direct parallels of the many issues we have experienced over the past 5 years with PV.

While our experience of issues we see in PV's monitoring, reporting, evaluating actions and implementing its management plans has primarily related to Barmah's Brumby population, we have seen firsthand PV's systemic lack of oversight, accountability and poor evaluation,

compromised by limitations in data. For 5 years the ABA has watched its concerns become increasingly evidenced, but with no recourse to hold PV to account for its actions.

PV's lack of transparency and accountability has in our view reduced its own credibility as a responsible land manager. We have had to resort to FOI requests to obtain reports on Wild Horse population counts, supporting evidence PV decisions are based upon scant research and reports from PV's Technical Reference group which advises PV on Brumby management.

We appreciate that there are many additional government authorities, often with conflicting priorities and constraints who impact on Barmah's wetland marshes, are outside PV's direct control which limits the ability to which PV's plan intentions can be achieved.

The YYTOLMB-JMP 2019 Draft p-39 explains that *in addition to primary partners (YYTOLMB, DELWP, YYNAC and PV, there are 13 other key government agency partners (List YYTOLMB-JMP p-39, suggesting there are a total of 17 partners involved in managing this area.*

Why has parks Victoria not provided this feedback, and recommendations on how to better manage Ramsar's wetlands in Barmah-Millawa? instead PV seem to accept the complicated arrangement and their consequential, ongoing, degradation of the Ramsar wetlands. Allowing the ongoing degradation without taking action to remediate, incorrectly supports the approach that all Brumbies must be removed before the Moira grasses can recover.

It may be that there is a compelling argument for the Parliament Inquiry, or a whole of management review into Parks Victoria's methods in research, developing policy and ability to implement policy in the context of the number of bodies involved.

5. ABA observations for future Barmah's wetland marshes management

Considerable research has provided comprehensive, quantified data on the correct flooding regimes required to meet Ramras's wetland survival needs. This research also identified two key opposing flooding interests; irrigation versus wetland survival; as being a significant factor to overcome by fragmented management agencies who do not share the same goals.

Assess the viability of future water supplies in terms of:

- Long term viability of water supply for people, irrigation and the environment,
- Values held on water usage for environment, heritage, irrigation, drinking and sport,
- Costs involved in managing water supplies and water use values,
- Options to balance a range of needs for long term sustainability, and
- If not, all options can be met long term, list options in terms of priorities to apply.

Management

- Simplify and clarify the chain of responsibility for Barmah's wetland needs,
- Agreement on Barmah's wetland management goals, actions and outcomes, and
- One agency to manage the coordination to ensure agreed actions occur.

If wetland flood regimes are not returned to pre water regulation changes, then we have little time to save Barmah's Ramsar wetland marsh environment since dire predictions show that all Moira grasslands and its dependent flora and fauna could disappear as early as 2026.

Please contact the ABA via [REDACTED] for any queries or clarification if needed.

Yours sincerely

[REDACTED]

President,
Australian Brumby Alliance Inc.

Attachments

1. River Red Gum Parks, Draft Management Plan, June 2017 (PV RRG-MP 2017 Draft).
2. Strategic Action Plan, Protection of Floodplain Marshes , Barmah National Park and Barmah Forest Ramsar Site 2019 – 2023 (Draft) (PV BNP-SAP 2019 Draft).
3. Draft Joint Management Plan for Barmah National Park, Yorta Yorta Traditional Owner Land Management Board 2019 (YYTOLMB-JMP 2019 Draft) which primarily references the actions outlined in PV BNP-SAP 2019 Draft report.

References

Beever et al. 2003: Beever, EA, Tausch, RJ and Brussard, PF 2003, 'Characterizing disturbance in semiarid ecosystems across broad spatial scales using multiple indices', *Ecological Applications* 13: 119–136.

Beever and Brussard 2004: Beever, EA and Brussard, PF 2004, 'Community- and landscape-level responses of reptiles and small mammals to feral-horse grazing in the Great Basin', *Journal of Arid Environments* 59: 271–297.

Beever and Herrick 2006: Beever, EA and Herrick, JE 2006, 'Effects of feral horses in Great Basin landscapes on soils and ants: direct and indirect mechanisms', *Journal of Arid Environments* 66: 96–112.

Bren 1988: Effects of river regulation on flooding of a riparian red gum forest on the River Murray, Australia

Chesterfield 1984: Chesterfield EA, Loyn RH, MacFarlane MA. 1984. Flora and Fauna of Barmah State Forest and their Management. Forests Commission of Victoria: Melbourne.

Chong & Ladson, 2003: Chong J, Ladson AR. 2003. Analysis and management of unseasonal flooding in Barmah–Millewa Forest, Australia. *River Research and Applications* 19: 161–180.

Colloff 2014: Ecology and conservation of grassy wetlands dominated by spiny mud grass *Pseudoraphis spinescens* in the southern Murray–Darling Basin, Australia, Mathew J. Colloff, Keith A. Ward and Jane Roberts.

Connell, 1978: Connell, J.H. 1978. Diversity in tropical rain forests and coral reefs. *Science* 199: 1302-1310.

Fahey C. 1986: The Barmah Forest - a History. Department of Conservation, Forests and Lands: Melbourne.

Gilfedder & Kirkpatrick 1994: Grazing and disturbance and the population dynamics of *Leucochrysum albicans* at Ross, Tasmania. *Australian Journal of Botany* 42, 417–430. | Crossref | GoogleScholarGoogle Scholar

ITRG 2016: Final report of the Independent Technical Reference Group: Supplementary to the Kosciuszko National Park Wild Horse Management Plan, report by the Independent Technical Reference Group to the Office of Environment and Heritage NSW, Sydney.

Linklater 2000: Linklater, W. L.; Cameron, E. Z.; Stafford, KJ; Veltman, C. J. 2000: Social and spatial structure and range use by Kaimanawa wild horses (*Equus caballus*: Equidae). *New Zealand Journal of Ecology* 24: 139-152.

Nimmo 2007: Nimmo, D.G. and K.K. Miller (2007). 'Ecological and human dimensions of management of feral horses in Australia: a review', *Wildlife Research*, 34: 408–417.

Rogers 1991: Kaimanawa feral horses and their environmental impacts. *New Zealand Journal of Ecology* **15**, 49–64.

Schultz 2011: Schultz N. L, Morgan J. W & Lunt I. D (2011) Effects of grazing exclusion on plant species richness and phytomass accumulation vary across a regional productivity gradient. *Journal of Vegetation Science* **22**, 130-42

Vivian 1913: Mapping the Moira Grass: The decline of *Pseudoraphis spinescens* grasslands at Barmah Forest, Victoria.; Post-doctoral Fellow Dr Lyndsey Vivian 1913

Whitworth et al. 2012: Drought, floods and water quality: Drivers of a severe hypoxic blackwater event in a major river system (the southern Murray–Darling Basin, Australia)

Willig et al 2018: M.R. Willig, S.J. Presley, in *Encyclopedia of the Anthropocene*, 2018
Intermediate Disturbance Hypothesis

Zalba & Cozzani (2004): The impact of feral horses on grassland bird communities in Argentina, Sergio M. Zalba & Natalia C. Cozzani, *Animal Conservation* (2004) **7**, 35–44
2004 Zoological Society of London. Printed in the United Kingdom
DOI:10.1017/S1367943003001094

Examples of more recent Flood Regime detailed Issues for Barmah-Millewa

Ladson 2005: Unseasonal Flooding of the Barmah-Millewa Forest, by Anthony R. Ladson & Joanne Chong; *Proceedings of the Royal Society of Victoria* **117**(1): 127-137. ISSN 0035-9211.

Abstract: *The Barmah-Millewa Forest is recognised in Australia and internationally as an ecologically significant site. However, river regulation has altered the frequency and pattern of forest flooding, and continues to have adverse environmental effects on the Forest. Compared to natural conditions, flooding is now less frequent in winter and spring and more frequent, unseasonally, in summer and autumn. In particular, small unseasonal floods that cover less than 10% of the forest are eight times more frequent now than before regulation. Unseasonal floods occur when rain leads to reductions in demand for water. Irrigators can cancel orders at short notice and water, which has already been released from upstream storages, continues downriver. Flooding occurs when these flows exceed the capacity of the reach of the river which flows through the forest. We explore the multiple factors that contribute to unseasonal flooding. These factors are related to the way the river regulation system - the infrastructure, rules and institutions - has been established and is operated to maintain the reliability of irrigation water supply. Options to reduce the incidence of unseasonal floods include: changes to the operating rules at Hume Reservoir and increasing airspace at Lake Mulwala.*

2012: Vivian, L and Godfree, R, The response of a degraded Murray River floodplain wetland to extreme drought and flood, in Grove, J.R and Rutherford, I.D (eds.) *Proceedings of the 6th*

Australian Stream Management Conference, Managing for Extremes, 6 – 8 February, 2012, Canberra, Australia, published by the River Basin Management Society, p.p.1 – 7.

Abstract: *Floodplain wetlands have been greatly altered by changes to river hydrology. Here, we examine the response of floodplain vegetation in the Barmah---Millewa Forest to a Large flood in 2010---11, following almost a decade of extreme drought. After river regulation in the 1930s, decreased depth and duration of flooding has resulted in the loss of the semi---aquatic grass *Pseudoraphis spinescens*, and the encroachment of *Juncus ingens* (giant rush). We investigate whether the recent flood has resulted in a trajectory of vegetation change back to *P. spinescens* grasslands, or whether *J. ingens* is sufficiently well---established such that it is resistant to change. Our results indicate that *J. ingens* has survived, but both survival and recovery declines with increased submergence duration. *P. spinescens* now occurs in just 6% of the floodplain, with limited flowering response. However, large areas of open water where *P. spinescens* was known to have historically occurred still exist, indicating that *J. ingens* is not the sole factor currently limiting *P. spinescens* distribution and abundance across the plain. Our data suggests that multiple high depth and duration floods are necessary to remove *J. ingens*, but this scenario is unlikely given river regulation. Furthermore, such a flood regime may also not necessarily lead to rapid recovery of *P. spinescens*.*

Are you having problems with this form, or do you want to mail us your submission instead? [Please contact us.](#)- No link came so rang 8682 2867 & was advised to email paec@parlia.....

Phone: 03 8682 2867

Email: paec@parliament.vic.gov.au