

PART THREE WATER CATCHMENTS

WILD HORSE IMPACTS

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December 2015

Our Australian Alps Are Changing For The Worse

Part Three: Water Catchments - Wild Horse Impacts

- This December 2015 report was prepared by Graeme L. Worboys, David Freudenberger and Roger Good and is available at: https://theaustralianalps.wordpress.com/the-alps-partnership/publications-and-research/our-australian-alps-are-changing-for-the-worse/
- The "Australian Alps are Changing Part Three: Water Catchments Wild Horse Impacts " is based on peer reviewed published literature, advice from many experts and the expertise, experience, active field research and observations of the authors in the Australian Alps protected areas that spans a period of 42 years. The document is a private statement and responsibility for it rests with the authors.
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- Citation: Worboys, G.L., Freudenberger, D. and Good, R. (2015) Our Australian Alps Are Changing....For The Worse: Part Three, Water Catchments Wild Horse Impacts", Canberra, Available at: www.mountains-wcpa.org and https://theaustralian-alps-are-changing-for-the-worse/
- In memory of Roger Good: Sadly, Alpine Ecologist, friend, colleague and co-author Roger Good passed away while this report was being prepared. Roger was committed to the conservation and protection of Australia's alpine environments and contributed greatly to their well-being and restoration. He will be missed.
- Acknowledgements: Appreciation is expressed to Luciana Porfirio for her contribution to this
 report. Chloe Sato kindly reviewed the text and the Australian Alps maps were prepared by
 Karl Bossard and Doug Mills unless otherwise referenced in the text.
- **Photo credits**: Photographs presented in this statement were provided by Graeme L. Worboys unless otherwise identified.

EXECUTIVE SUMMARY

- Wild horses are seriously impacting the catchments of the Australian Alps national parks to the detriment of Australia's economy and the environment.
- Water from the Australian Alps provides the Murray-Darling Basin irrigation areas and its towns and cities with 29% of its water it is used for drinking water and agriculture.
- This Alps water is worth an estimated \$9.6 billion per annum in droughts it is even more valuable.
- There is less water The impact of wild horses on catchments affects the amount of water available from the mountains.
- Water quality is impacted given the eroding catchments.
- Water run-off is changed there is much more rapid run-off.
- The impacts of wild horses on our critical Alps wetlands are pervasive

 they are at a landscape scale.
- Wild horse numbers are growing impacts are growing, given limited controls.
- With hotter and drier climate change conditions, the Alps water becomes even more important to downstream users.
- In the interests of the Australian economy, people's livelihoods and the integrity of the Alps environments, impacts to the catchments need to be halted, wild horses removed and urgent restoration work undertaken.

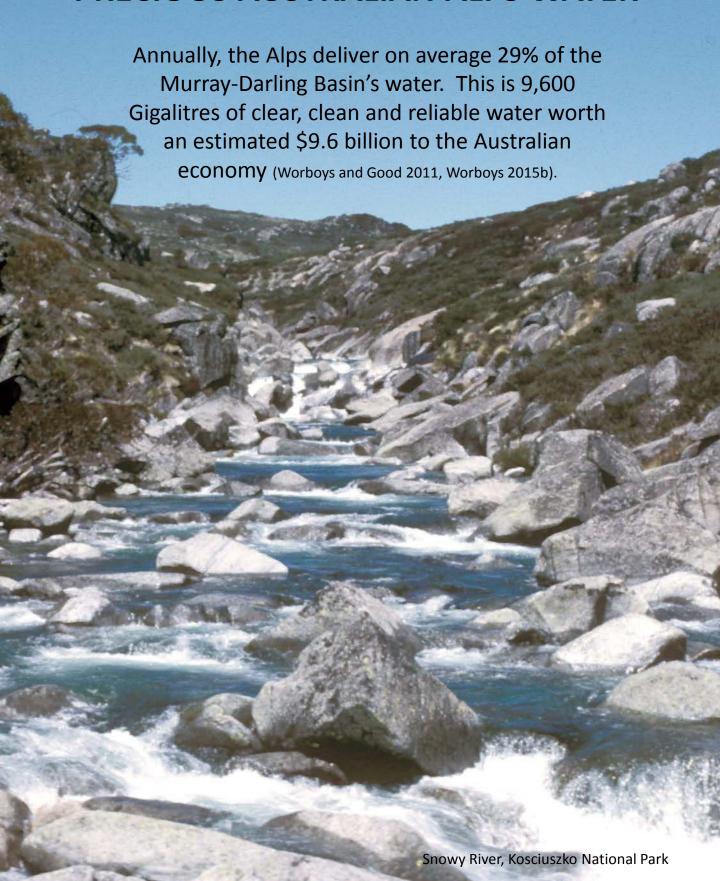
INTRODUCTION

In 2015, invasive wild horses were impacting the National Heritage listed Australian Alps national parks at a landscape scale and the full extent of the mainland mountain environments (Worboys et al, 2015). Their numbers were directly impacting the Alps catchments and consequently the delivery of high quality and precious water from the Alps catchments to the Murray-Darling Basin.

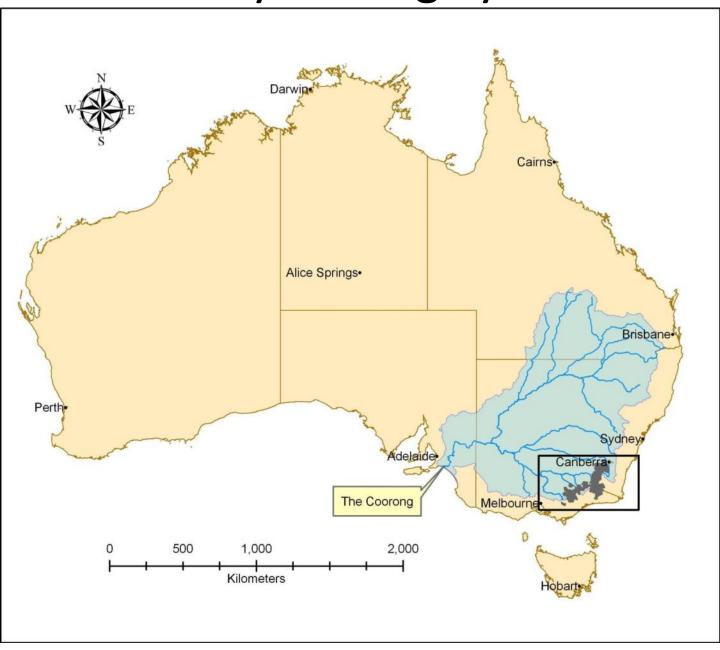
In Kosciuszko National Park (part of the Australian Alps national parks), the introduced wild horse population had increased by 30% in just 5 years from 4,200 (2009) to 6000 (2014) despite authorised control methods. In 2015, official trapping programmes removed just 139 wild horses, and wild horse impacts to mountain wetlands and Australian native mountain animals were steadily getting worse. These environmental impacts to wetlands have been described in "Australian Alps Are Changing … For the Worse", Part One and impacts to our rare and endangered mountain animals in Part Two (Worboys et al, 2015; Worboys 2015a).

In this Part Three "Australian Alps Are Changing ... For the Worse" document we describe both the economic and environmental impacts of wild horses to the delivery of water from the Alps catchments and the impacts to water yield, high quality water and average flow regimes for the future.

PRECIOUS AUSTRALIAN ALPS WATER



The Australian Alps and the Murray Darling System



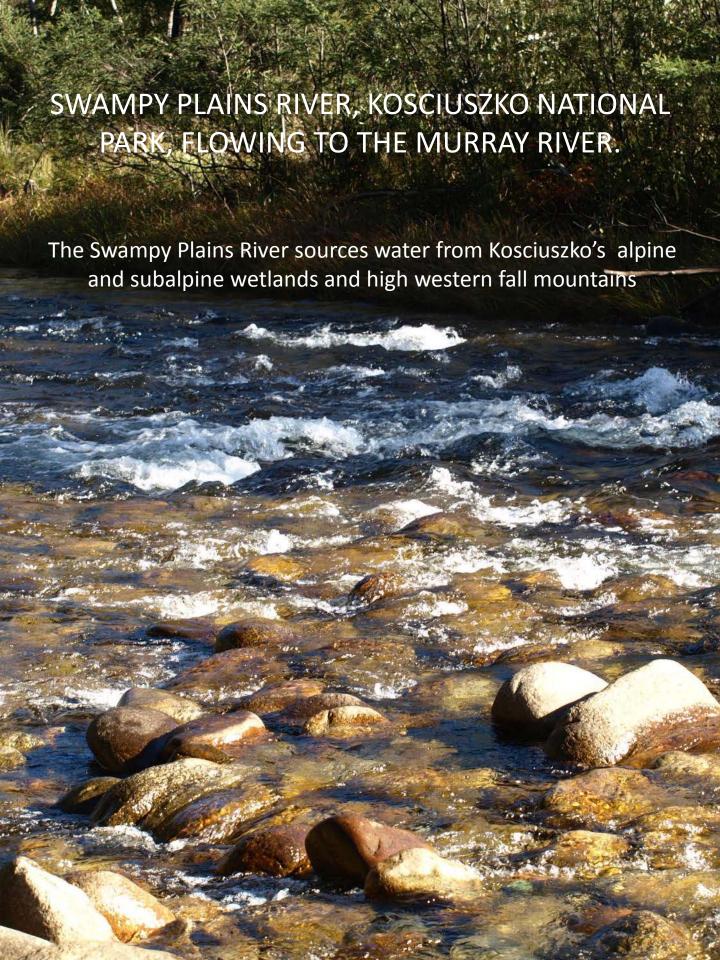
The total inflow water for the Murray-Darling Basin is estimated to be 32,800 GL per annum. The Basin generates \$15 Billion worth of Australia's agricultural products annually. It includes 40% of Australia's farms and supports 2.1 million people. The Alps water contribution to the Basin (29%) is critical (Worboys and Good 2011).

WITH DROUGHTS: AUSTRALIAN ALPS WATER BECOMES EVEN MORE PRECIOUS

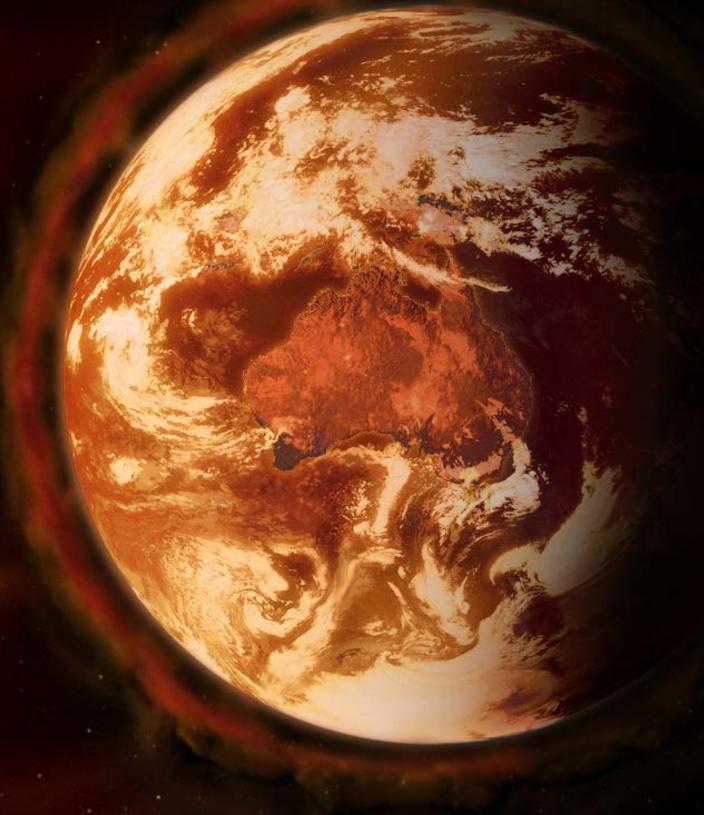


In droughts, the Australian Alps provides proportionally more water for the Murray Darling Basin. It helps maintain drinking water for towns and cities from Jindabyne to Adelaide (Worboys and Good 2011).





CLIMATE CHANGE: Projections for south-eastern
Australia are for it to be hotter and drier



2050 ALPS CLIMATE CHANGE PROJECTIONS: Hotter and drier

(Worboys and Good 2011).

Precipitation: Reduced by 24%

Powerful mountain storms: downpours, rapid runoff, and potential for downstream flooding

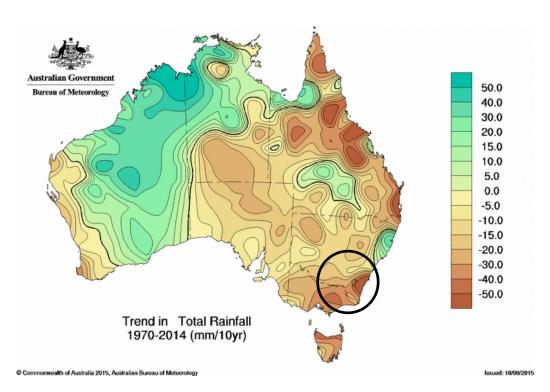
Heat waves: More days above 35°C

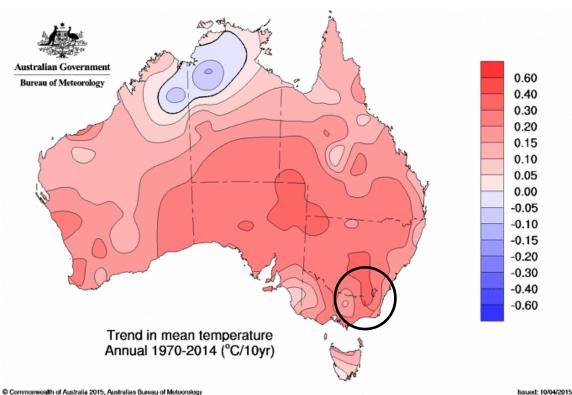
Droughts: More frequent

Bushfires: Increased risk of more intense and

more frequent bushfires

2015 TRENDS: The Australian Alps are already hotter and drier





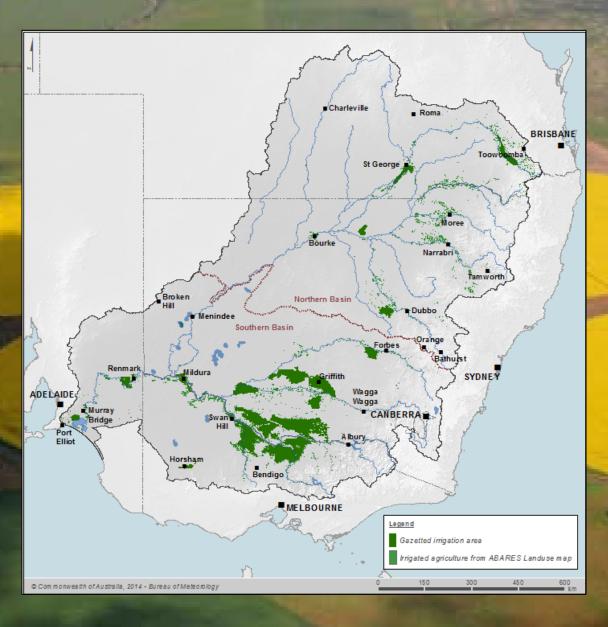
CLIMATE CHANGE IMPACTS: Less Alps water for the Snowy, Murray and Murrumbidgee Rivers

LESS POTABLE WATER: Affecting potable water supplies for people and Murray-Darling Basin towns and cities from the Australian Alps downstream to Adelaide and the Coorong



CLIMATE CHANGE IMPACTS: Less Alps water for the Murray and Murrumbidgee Rivers

LESS AGRICULTURAL WATER: Affecting the Murrumbidgee and other Murray-Darling Basin irrigation areas



CLIMATE CHANGE IMPACTS: Less Alps Water for the Murray and Murrumbidgee Rivers

LESS ENVIRONMENTAL FLOW WATER: Affecting environmental flows essential for the health of the Murray and Murrumbidgee Rivers and their associated wetlands and native forests



CLIMATE CHANGE IMPACTS: Less water yield for the Snowy, Murray and Murrumbidgee rivers

LESS SNOW: Extinguishing the historical spring thaw, snow-melt rush of rivers that is coincident with spring agricultural water use

LESS PRECIPITATION: Diminishing hydro-power generation and lower water yield from the catchments of Australia's major rivers.

MORE POLLUTION: Enhanced soil erosion caused by wild horses at a time of climate change impacts hydro-scheme impoundments and turbines (Good 2015)



FOR OUR CLIMATE CHANGE FUTURE:

EVERY DROP OF ALPS CATCHMENTSWATER IS PRECIOUS AND NEEDED!

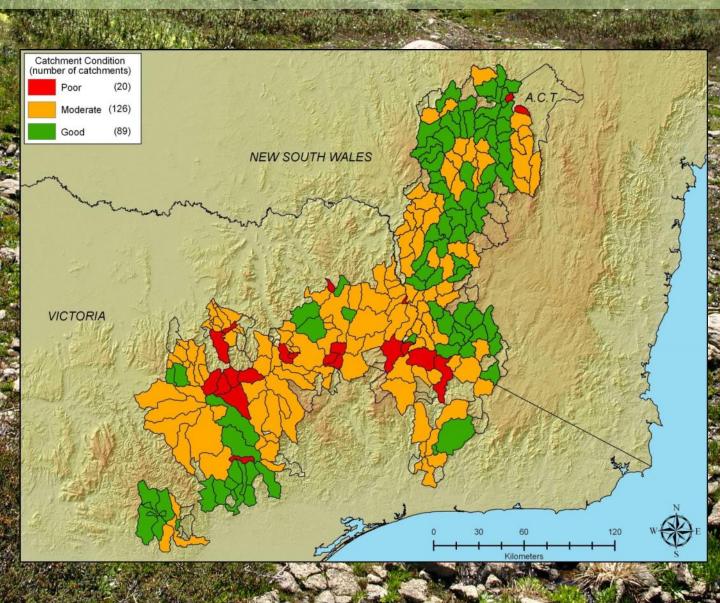
The Australian Alps catchments need to be in top natural condition to deal with climate change affects including:

- An absence of snow;
- Hotter conditions;
- Drier conditions;
- Extreme fires and



WHAT IS THE CURRENT CONDITION OF THE ALPS CATCHMENTS?

A 2010 review of the condition of the Australian Alps catchments found far too many Alps sub-catchments were in a "Poor" or "Moderate" condition. The impact of wild horses was a major cause of catchment degradation (Worboys and Good 2011, Good 2015)

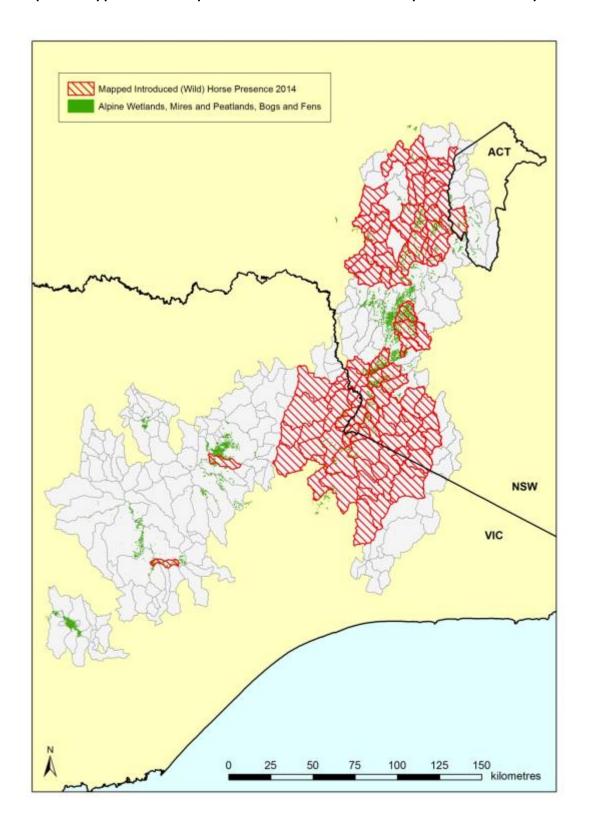


ALPINE AND SUBALPINE WETLANDS ARE CRITICAL FOR THE ALPS CATCHMENTS WATER DELIVERY



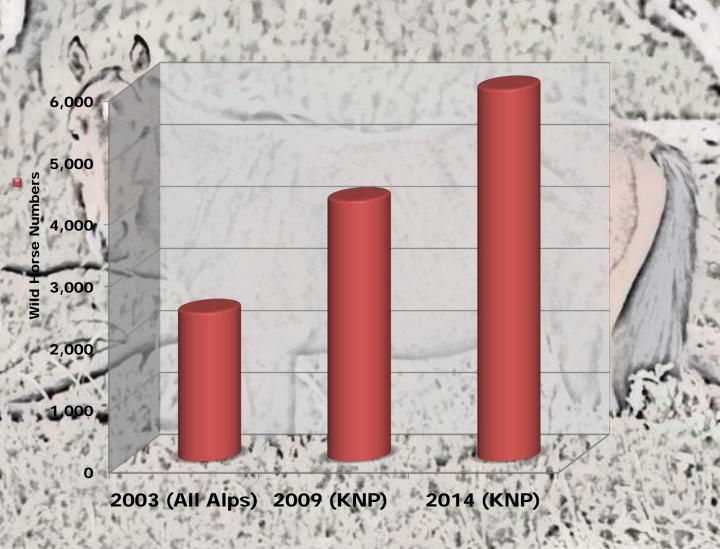
WILD HORSE IMPACTS ARE AT A LANDSCAPE SCALE IN THE ALPS

(2014 mapped wild horse presence based on interviews with protected area staff)



WILD HORSES ARE INCREASING IN NUMBER

(despite authorised control methods)



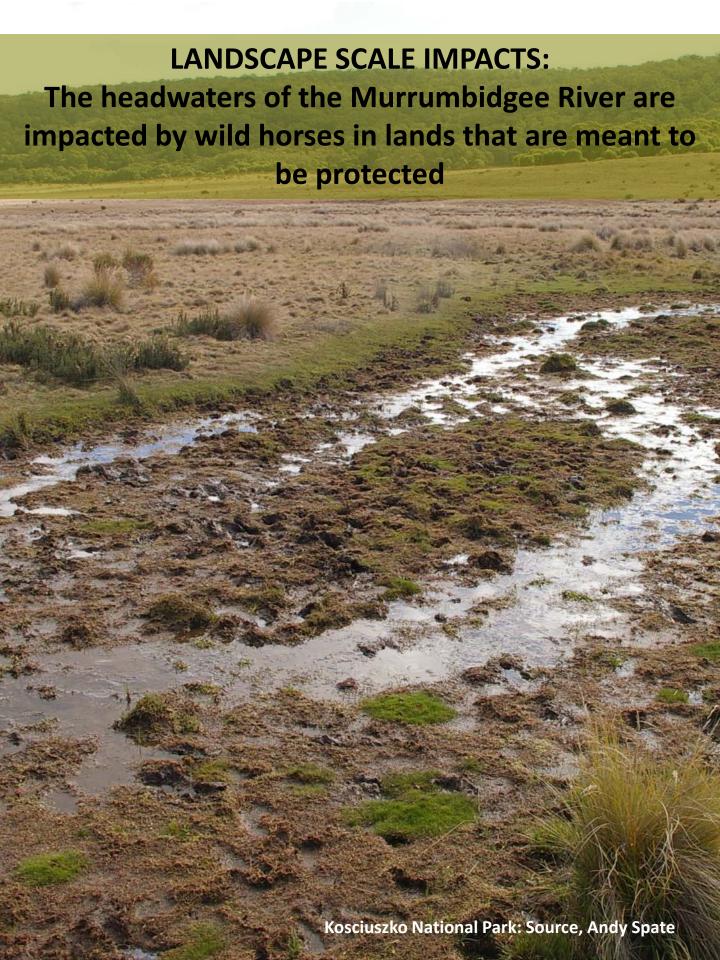
A 30% increase in just 5 years (2009 - 2014)



The headwaters of our mighty Murray River are impacted by wild horses in lands that are meant to be protected









The drier (rain shadow) Snowy River Valley lands are impacted by wild horses in land that is meant to be



Wild horses are now the dominant grazing animals on these dry and fragile slopes of the Lower Snowy River Valley, Kosciusko National Park. The impact of their grazing and trampling can be seen on the left of this fenced exclosure established 30 years ago. Horses are preventing the natural (slow) recovery of these slopes from historic over-grazing by sheep and cattle.

Source: Ian Pulsford

WILD HORSE IMPACTS:

Pugging, trampling and grazing impacts to Alps wetlands results in less water yield, more rapid runoff and lower water quality



Wild horse impacted wetland, Kosciuszko National Park

BY COMPARISON:

A natural Alps wetland with no wild horse impact features:

- Thick protecting vegetation;
- Rich, aerated sphagnum bog communities;
- A raised water table with occasional ponds; and
- The presence of a rich suite of Australian native species.



Ginini Swamp, A.C.T. - Where management has effectively excluded wild horses from this Canberra water supply catchment. Ginini Swamp maximises water yield, provides high water quality and buffers the catchment against severe storms

WILD HORSE TRAMPLING IMPACTS: Results in Alps streams with more rapid runoff and polluted water through: Trampling caused stream down-cutting and erosion; Lowering of streamside water tables; Loss of streamside vegetation; More rapid runoff; and Dirty, sediment laden water. A headwater tributary to the Snowy River, Kosciuszko National Park

BY COMPARISON:

An Alps catchment stream in a natural condition features:

- A non-eroding stream;
 - Raised water table;
- Thick streamside vegetation;
- Shaded water minimising evaporation;
- Aerated sphagnum bog communities; and
 - A rich suite of native animal species.

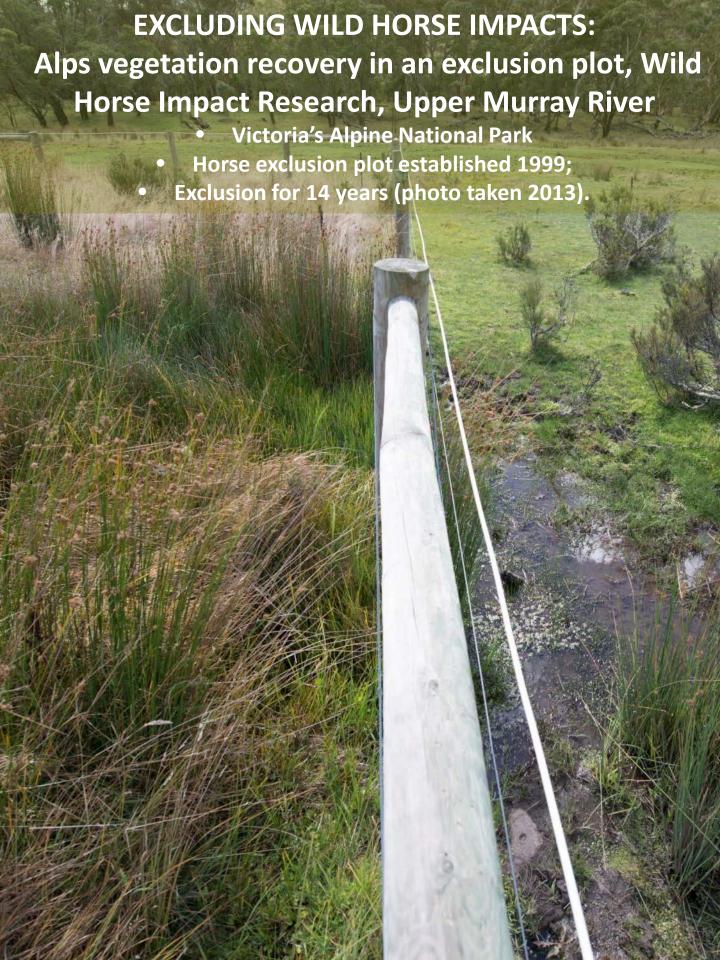


WILD HORSES AND SOIL EROSION

Wild horses are a serious contributor to soil erosion, Snowy River Valley, Kosciuszko National Park



Soils on hill slopes in the very dry Lower Snowy area of Kosciuszko National Park are easily disturbed with recovery taking a long time. Wild horses disturb slopes leading to ongoing erosion. The photo shows the accumulation of eroded soil against a half metre high fence constructed 30 years ago. Source: David Freudenberger



THE CURRENT TRAJECTORY: Wild horses are on course to degrade all of the Australian Alps wetlands and catchments



Alpine area soil erosion loss in the 1960's at Mount Carruthers, Kosciuszko National Park due to long term cattle and sheep grazing (Good 2015) ... prior to soil erosion control work

WILD HORSE IMPACTS: Implications for water

Potable water supplies:

- Less water available
- More polluted water



Agriculture:

- Less water available
- More polluted water
- More extreme river flows including floods



River environmental flows:

- Less water available
- More polluted water
- More extreme water flow regimes



Hydro-electric schemes:

- Less water available
- More polluted water
- Sedimentation of dams
- More extreme water flow regimes



CLIMATE CHANGE IMPACTS:Further impacts for Alps water catchments



CONCLUSIONS

- 1. CATCHMENTS: The growth in non-native wild horse numbers is on target to degrade ALL of the Australian Alps wetlands and catchments.
- 2. WATER: Impacts of wild horses reduce water yield; reduce the quality of the mountain water and cause more rapid runoff in extreme weather conditions.
- 3. ECONOMIC IMPACTS: The Alps wetlands and catchments deliver water worth an estimated \$9.6 billion annually. Reduced Alps water flows will impact financial return from hydro-electric power generation and from agriculture.
- 4. SOCIAL IMPACTS: Reduced water flows and lower quality water from the Alps will influence the cost and availability of potable water downstream with its consequent effects on society.
- 5. CLIMATE CHANGE: Wild horses are the worst possible vector for causing damage to the Alps catchments and water delivery at a time of climate change.
- 6. WILD HORSE CONTROL: Wild Horses have grown in number from 4200 to 6000 in the last 5 years. Just 139 were removed from Kosciuszko National Park in 2015. Control methods have been grossly inadequate relative to the magnitude and seriousness of the problem.

CALL TO ACTION

Future droughts and climate change influenced water scarcity will profoundly influence Australians ... and especially the millions of people along the Murray River system from the Australian Alps to the Coorong. Every drop of water flowing from the mountain catchments will be critical for their future well-being ... reasonably, they would expect that these catchments are being well managed ... and ... that wise decisions are being made to protect the delivery of "their" water from these catchments. Unfortunately, this report demonstrates that there are very real concerns for the optimum delivery of water from the Alps due to the pervasive catchment impacts of wild horses.

This call to action seeks to redress this issue.

1. WILD HORSES

Wild horses need to be removed from the Australian Alps national parks. They directly threaten ALL of the Australian Alps wetlands and the integrity of the Alps catchments. Their impacts are an unacceptable economic and environmental cost to society.

2. REAL FUNDING

Realistic funding is needed for managers to implement a comprehensive and effective wild horse removal program

3. RESTORATION

Realistic funding is needed to restore the catchment damage in the Alps caused by wild horses. This restoration would be conducted at a landscape scale, with wetlands restored, stream erosion halted and soil erosion treated.

REFERENCES

Good, R. (2015) Protecting the Alps catchments in Kosciuszko National Park: Feral horse management and control, with specific reference to the impacts of horse on alpine and montane bogs and fens, Submission to the Independent Technical Reference Group, Wild Horse Management Plan Review, NSW Office of Environment and Heritage

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Worboys, G.L. and Good, R. (2011) *Caring for our Australian Alps Catchments, Summary Report for Policy Makers,* Department of Climate Change and Energy Efficiency, Canberra

Worboys, G.L., Freudenberger, D., Good, R., Pulsford, I. and Banks, S. (2015) *Our Australian Alps are Changing ... For the Worse,* Available at: https://theaustralianalps.wordpress.com/the-alps-partnership/publications-and-research/our-australian-alps-are-changing-for-the-worse/

Worboys, G.L. (2015a) *Our Australian Alps Are Changing For the Worse, Part Two, Wild Horse Impacts to our Australian Mountain Animals*, Available at: https://theaustralianalps.wordpress.com/the-alps-partnership/publications-and-research/our-australian-alps-are-changing-for-the-worse

Worboys, G.L. (2015b) 'Protected areas and water catchments: The Australian Alps', in (eds) Figgis, P., Mackey, B., Fitzsimons, J., Irving, J. and Clarke, P. *Valuing Nature, Protected Areas and Ecosystem Services*, Australian Committee for IUCN, Sydney

SUGGESTED FURTHER READING

WILD HORSE IMPACTS TO ALPS WETLANDS

Worboys, G.L., Freudenberger, D., Good, R., Pulsford, I. and Banks, S. (2015) *Our Australian Alps Are Changing For the Worse*, Available at: https://theaustralianalps.wordpress.com/the-alps-partnership/publications-and-research/our-australian-alps-are-changing-for-the-worse/

The "Australian Alps are Changing" report describes the impact of the non-native Wild Horse on Australia's Natural Heritage Listed alpine and subalpine environments. It identifies that horses selectively target rare wetland environments in the Alps and how they progressively degrade them. The report identifies that these wetlands are critical for delivering the high quality Alps water to the Murray Darling Basin. Horse numbers are growing rapidly and the report maps the expansion of wild horse affected areas in the Alps during the period 2010-2014.

WILD HORSE IMPACTS TO ALPS ANIMALS

Worboys, G.L. (2015) *Our Australian Alps Are Changing For the Worse, Part Two, Wild Horse Impacts to our Australian Mountain Animals,* Available at: https://theaustralianalps.wordpress.com/the-alps-partnership/publications-and-research/our-australian-alps-are-changing-for-the-worse/

The "Australian Alps are Changing, Part Two" report deals with the impacts of the introduced wild horse on our Australian mountain native animals. It identifies how rare nationally and internationally these mountain animals are with many species restricted to sub-alpine and alpine "islands". The report introduces mountain mammals, amphibians, birds, reptiles and invertebrates and provides 11 examples of how wild horses are directly and indirectly impacting these species. It describes the potential for extinctions and provides a "Call To Action" which seeks the removal of wild horses from the National Heritage Listed Australian Alps national parks.