Observations of Pest Horse Impacts in the Australian Alps, March 2013

Graeme L. Worboys and Ian Pulsford

This report has been prepared by Graeme L. Worboys and Ian Pulsford and is available at: www.mountains-wcpa.org

Important notice:
This "Observations" Report is produced for general information and is a record of personal observations made by the authors for the Mt Pilot area of Kosciuszko National Park in 2013. It has been prepared within the context of the authors participating in inspections of this area over a period of 40 years from 1973 to 2013. Responsibility for the report contents rests with the authors.

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Cover photo:

Photo of a Cowombat Flat pest horse exclusion plot established in 1999, Alpine National Park Victoria showing a 14 year ungrazed area within the exclusion area (photo-left) and all other areas accessible to pest horse grazing, pugging and disturbance to native vegetation (Source: Graeme L. Worboys).

2013 Observations of Pest Horse Impacts in the Australian Alps

[Observations arising from an inspection of the Big Boggy River, Cascade Creek, Ingegoodbee River and Murray River headwater catchments, Kosciuszko National Park, 22 and 23 March 2013.]

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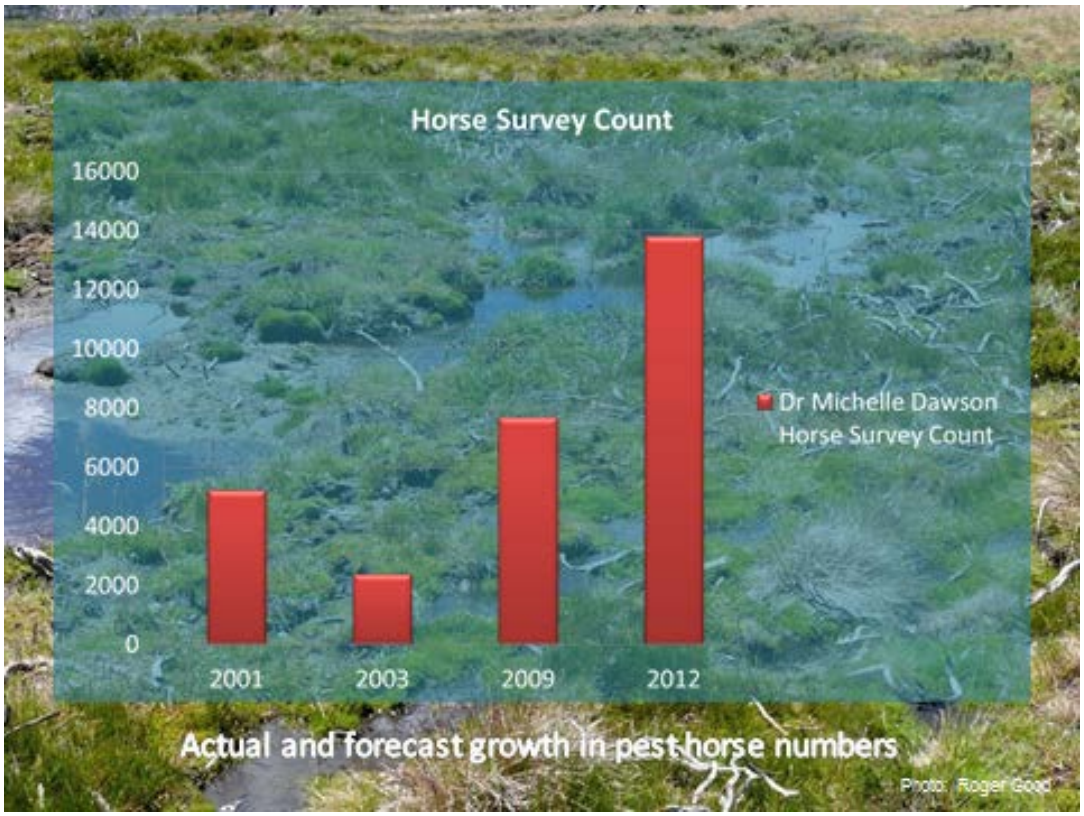
Introduction

Observations on the 22 and 23 March 2013 identified unprecedented, pervasive and destructive pest horse impacts for over 43 kilometres of the highest headwater catchments of the Murray and Snowy Rivers south of Thredbo. These impacts were the worst ever observed in 40 years of personal inspections of the Dead Horse Gap to Tin Mines section of the Pilot Wilderness of Kosciuszko National Park (KNP) in New South Wales (NSW) and Cowombat Flat area of the Victorian Alpine National Park. Both of these parks form part of the Australian Alps national parks.

Horses are a non-native species in the Australian Alps parks. They are wild populations that are often referred to as wild horses, brumbies, feral horses and pest horses. Michelle Dawson (2005) notes that horses were first introduced into Australia in 1788 and with many escapes and the establishment of wild population that were regarded as a feral pest in the 1860's. Eric Rolls states in his landmark book "They All Ran Wild" (1969) that "Between the late 1860's and 1890's horses were a major nuisance in NSW and Victoria – *a very weed among animals…the squatters shoot him off in organised battues to prevent the lawless depredations upon unfenced sheep walks*". In the Australian Alps, some graziers regularly shot and eradicated these pests while others actually released horses into new areas (Dawson 2005). We use the description pest horse here given they are a highly damaging introduced animal in some of Australia's most iconic and important mountain national parks.

The Mount Pilot area as part of Kosciuszko National Park was reserved in 1944 and during our patrols of this area in the 1970's and early 1980's we witnessed pest horses and horse impacts, but the impacts were not nearly as bad as those we observed in March 2013. These were the worst we had ever seen. Researchers have identified a rapid growth in the number of horses in recent years and this helps establish why such observations were made. In 1990, researcher Jenny Dyring estimated there were several hundred horses in south Kosciuszko (which includes the Big Boggy River, Cascades Creek, the Ingegoodbee River and Cowombat Flat) and 11 years later, researcher Michelle Dawson conducted an aerial survey

(2001) that estimated the horse population to be three times that number with densities in the Big Boggy of about 2 horses per square kilometre and Cowombat populations stable to be 6.4 per square kilometre (Dawson 2005). She also estimated horse numbers to be about 5200 horses for all aerial surveyed areas in the Australian Alps national parks. This population count was completed immediately prior to the 2003 Australian Alps fires. A post fire 2003 aerial survey found horses to be impacted by the event and the population was estimated to be about 2369. A 2009 aerial survey found the population to be about 7679 and this represented an annual increase of 21% per annum from 2003 (Dawson 2009a). This was despite live capture and removal action by park agencies. Michelle Dawson (2009) also forecast a pest horse population of 13,800 by 2012 (Figure 1).



(Figure 1) Pest horse population estimates and forecast growth (After Michelle Dawson 2009a).

In 2013, we observed the direct impacts of a very large number of horses. We believe this damage to be as bad as the worst historic grazing impacts to the high mountain catchments that triggered the 1940's removal of stock grazing from Kosciuszko National Park. The Mt Pilot area was still recovering from these grazing era impacts and it is being impacted yet again. Our observations of these horse impacts are illustrated and are briefly described by this report.

IMPACTS OBSERVED

Pest horse impacts observed included grazing, trampling, dust baths, soil compaction, soil erosion, pugging, stream bank destruction, stream course disturbance and incision and sphagnum bog and wetland destruction. The impacts were along the entire length of the

headwater streams of the Mount Pilot area (part of the Great Dividing Range) and for at least 43.5 kilometres of these streams. Impacts were directly observed on this inspection:

1) for two kilometres of the 9.5 kilometres of the Big Boggy River upstream of the Alpine Way (Snowy River Catchment);

2) for about a kilometre of the six kilometres of the upper Cascades Creek (Murray River Catchment);

3) for about 8 kilometres of the 27 kilometres of the Ingeegoodbee River headwaters in NSW (part of the Snowy River catchment); and

4) for about a kilometre of the very headwaters of the Upper Murray River at Cowombat Flat.

Vegetation destruction

The excessive numbers of pest horses were observed to be directly destroying sub-alpine native vegetation and this was best illustrated in 2013 at pest horse exclosure plots established at Cowombat Flat in 1999. These Victorian Cowombat Flat exclosure plots are 14 years old and are located about 100 metres from the unfenced NSW (and Kosciuszko National Park) border. The plots were established to assess the impact of pest horses on streams and vegetation. The impacts were visually very clear. However researchers Thiele and Prober (2007) confirmed that the horse grazing, trampling, and pugging resulted in bare ground in the stream channel and stream banks in the unfenced areas and prominent vegetation regeneration and diffuse stream flow occurred in the exclosure plots. In addition, it is known that pest horses have a preference for valley bottoms, wetlands, alpine bogs, peatlands and stream side areas (Dawson 2009b) and this means that the integrity of the important mountain catchment habitats were selectively impacted.

Horse impacted vegetation surrounding a 1999 exclosure plot with its protected vegetation, Cowombat Flat, Victorian Alpine National Park, near the NSW border, 23 March 2013 (Source: Graeme L. Worboys).

1999 exclosure plot fence with protected (left) and unprotected vegetation, Cowombat Flat, Victorian Alpine National Park, 23 March 2013 (Source: Graeme L. Worboys).

Creek (flowing from right to left) bank impacted by horses as it emerges onto Cowombat Flat from dense re-generated wetland habitat within a 1999 exclusion plot (Source: Ian Pulsford).

Pest horses grazing in wet heath habitats, Ingeegoodbee River near Tin Mines Hut, 23 March 2013, Kosciuszko National Park, (Source: Graeme L. Worboys).

Grazing impacts on vegetation have noticeably increased in 2013 from observations made on patrols in the 1970's and 1980's.

Grazing and trampling of sphagnum and wetland species (an Endangered Ecological Community), Tin Mines Track between Cascades Hut and Tin Mines Hut, Kosciuszko National Park 22 March 2013 (Source: Graeme L. Worboys).

Stream bank destruction

Based on our observations, it is estimated that more than 43 kilometres of stream bank impacts including vegetation destruction and stream bank collapse have occurred.

Horse trampling impacts to stream banks and stream bank collapse, headwaters of the Ingeegoodbee River near Tin Mines Hut, Kosciuszko National Park, 22 March 2013 (Source: Graeme L. Worboys).

Horse trampling impacts to stream banks and stream bank collapse, headwaters of the Ingeegoodbee River near Tin Mines Hut, Kosciuszko National Park, 23 March 2013 (Source: Graeme L. Worboys).

Flat compacted and altered vegetation combined with stream bank trampling and grazing impacts by horses, headwaters of the Ingeegoodbee River between Tin Mines Hut and Freebody's Hut, Kosciuszko National Park, 23 March 2013 (Source: Graeme L. Worboys).

Former sub-alpine riparian bog trampled and transformed into a large mud pan by horses in the upper headwaters of the Ingeegoodbee River, 23 March 2013 (Source: Ian Pulsford).

Horse use of a crossing of the Big Boggy River, headwaters of the Thredbo River and a tributary of the Snowy River, Kosciuszko National Park, 22 March, 2013 (Source: Graeme L. Worboys).

Natural stream banks in subalpine streams are typically vegetation rich, stable with no organic soil showing and they are not eroding. These environments, in an undisturbed state, host a range of Australian native species, some of which are restricted to these subalpine and alpine environments.

Pest horse impacts at the very headwaters of the Murray River, Cowombat Flat, Victoria, upstream of the exclusion plots, Victoria Alpine National Park, (and 100 metres from the NSW and Kosciuszko National Park border) 23 March 2013 (Source: Graeme L. Worboys).

Interior of a small pest horse grazing and trampling exclusion plot that has been free of pest horse impacts for 14 years; headwaters of the Murray River, Cowombat Flat, Victoria, Victorian Alpine National Park (100 metres from the NSW and Kosciuszko National Park border) 23 March 2013 (Source: Graeme L. Worboys).

Wetland pugging

Wetlands are one favoured environment of the pest horses. These sub-alpine environments are listed as *Endangered Ecological Communities* under the *EPBC (1999)* Act.

Trampling impacts to a sub-alpine bog near Tin Mines Hut, Kosciuszko National Park, 23 March 2013 (Source: Graeme L. Worboys).

Trampling impacts to a former wet heath and sub-alpine bog between Cascades Hut and Tin Mines Hut, Kosciuszko National Park, 22 March 2013 (Source: Graeme L. Worboys).

Trampling impacts to a wetland area at Tin Mines Hut, Kosciuszko National Park, 23 March 2013 with remnant soil pedestal (Source: Ian Pulsford).

Trampling impacts to a wetland area between Tin Mines Hut and Mt Pilot, Kosciuszko National Park, 23 March 2013 (Source: Graeme L. Worboys).

Dec 1986: Original photo of Ingeegoodbee River wetlands at a time of lower pest horse population numbers; Ingeegoodbee River Flats, Kosciuszko National Park south of Freebody's Hut, (Source: Di Thompson).

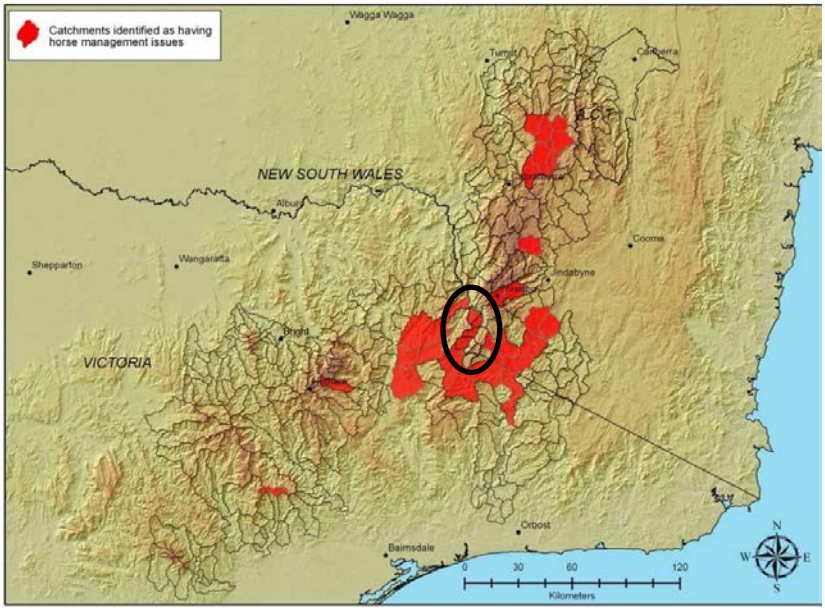
March 2013: Comparative photo taken 27 years later of pest horse damage Ingeegoodbee River Flat wetlands, Kosciuszko National Park, south of Freebody's Hut (Source: Graeme L. Worboys).

Dust bath impacts

Dust baths are used by the pest horses to roll in as part of their cleansing and are a ubiquitous feature of these disturbed landscapes.

Horse dust bath, Cowombat Flat, Victoria, 100 metres south and east of the NSW border (Source: Graeme L. Worboys).

Observations: Catchments with pest horse problems



In 2010, a Technical Report on the condition and trend in condition of all of the Australian Alps catchments mapped the distribution of identified pest horse threats in red (Worboys and Good, 2010). Observations made during the 2013 inspection indicate that the pest horse problems have expanded beyond the 2010 mapped areas.

Observations: Catchment change in condition

The streams and rivers observed are within Australia's highest catchments; they are found along the continental divide and they are in protected areas. This is where Australia's water should be at its purest and the catchments should be in their best condition. The condition of the observed catchments (circled) was assessed in 2010 and it was found that they were mostly in a moderate condition (Figure 2) but declining (Figure 3). The same catchments observed in March 2013 were estimated to be in a poorer condition than assessed in 2010 and were observed to be in a state of further decline.

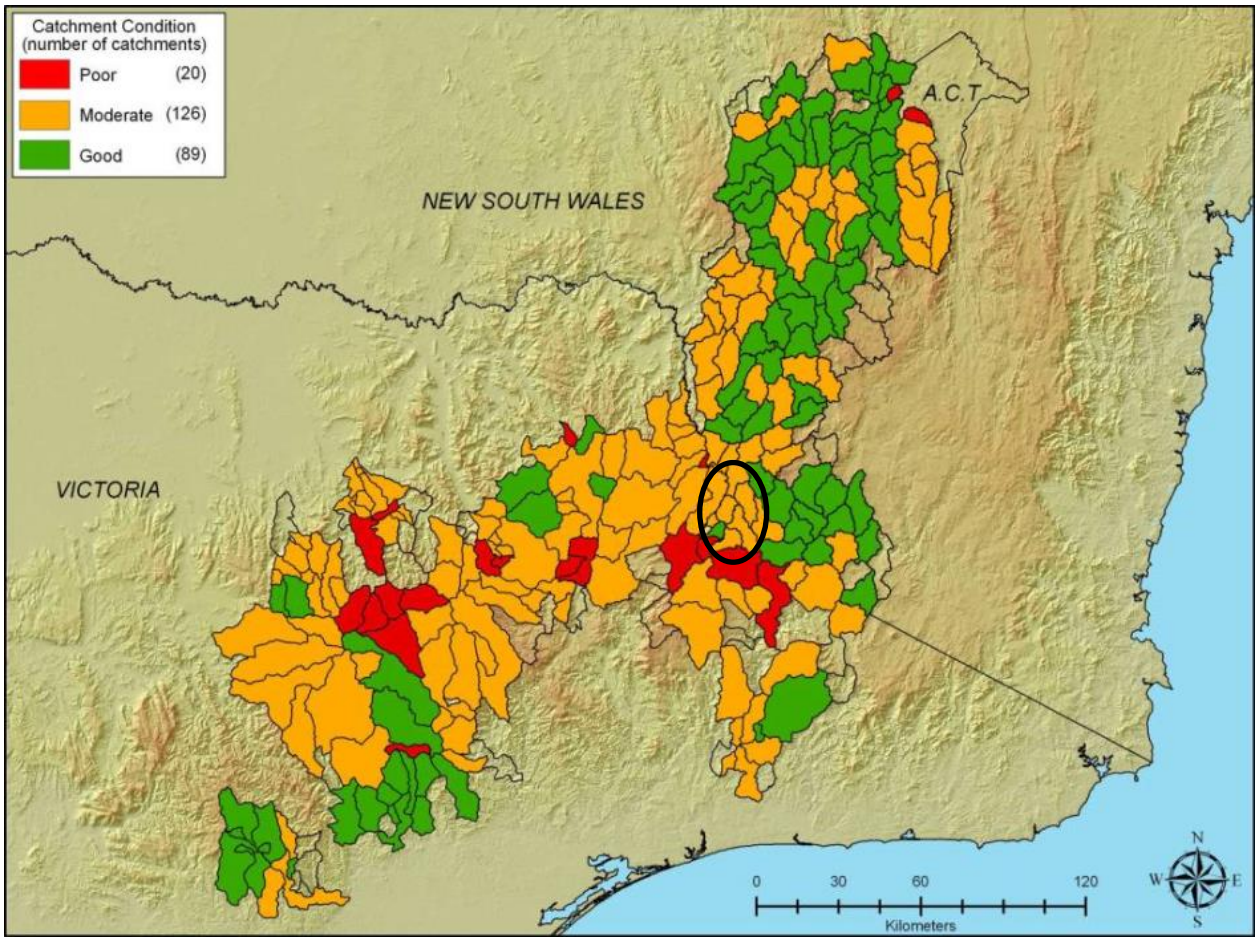


Figure 2. Condition of the Australian Alps Catchments (Worboys and Good, 2010).

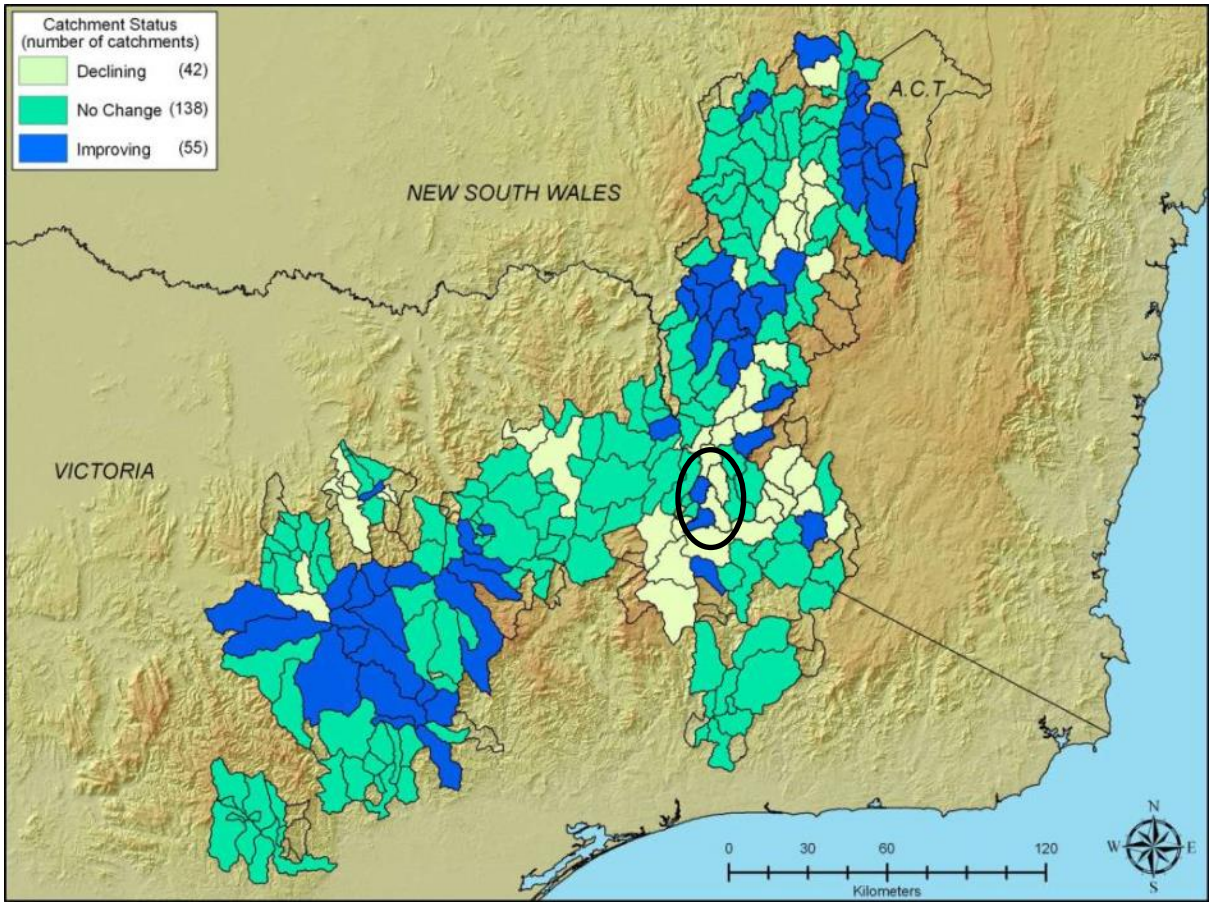


Figure 3 Trend in condition of the Alps catchments (Worboys and Good 2010).

Observations: Victoria's water catchments and environmental water flows

The catchments of the Pilot, Jacobs and Ingeegoodbee Rivers of the Pilot Wilderness area of Kosciuszko National Park, NSW are special. They are free of any Snowy Mountains Hydro-electric engineering modification; they provide critical snow-melt water in spring to downstream environments and year round environmental water flows to an otherwise highly modified flow regime of the Snowy River. This high mountain catchment water is of utmost importance to Victoria. Observations along the 27 km's of the Ingeegoodbee River in NSW identified substantial disturbance and degradation of this transboundary catchment which means higher sediment loads and changed river flow regimes.

Observations: Impacts to water flow regime

Disturbance and removal of stream side vegetation in organic soil rich sub-alpine environments causes more rapid run-off, stream incision, a higher load of eroded sediment and short sharp pulses of higher energy water flow during rainfall events. This is distinctly different to the more orderly undisturbed (natural) streamside vegetation that filters water flows and reduces the energy of water run-off. Pest horse impacts are changing the natural flow regimes of mountain streams at a time when climate change forecasts identify more severe storms in the catchments and an increased need for stable, natural catchments (Worboys and Good 2010).

Observations: Impacts to water quality

Horse disturbance to stream-banks, rapid run-off and stream down-cutting were observed to be causing non-natural sediment loads to be transferred downstream. In steep country, multiple horse tracks along contours and through dense as well as more open shrubby understorey were observed. These maintain soil disturbance and subsequent soil erosion and siltation of streams. It is known from research that the historic natural "chain-of-ponds" that occurred during periods of low flows along rivers and which maintained deep cold water in streams suitable for native fish and invertebrate populations and riverside biodiversity, have disappeared in the Snowy River. In addition faecal contamination of the mountain streams is enhanced by the copious and ubiquitous (often territorial marker) piles of pest horse faeces.

Streamside trampled *Sphagnum* moss (the light coloured plant) and horse faeces and between Cascades Hut and Tin Mine Hut, Kosciuszko National Park. The sp0nge-like Sphagnum helps to filter and slowly release water from stream side bogs (Source: Graeme L. Worboys)

Observations: Impacts to water yield

Wetlands were impacted in all of the catchments observed. Disturbance means that they were more open, exposed and water yield can be expected to be lowered in the mountain catchments through enhanced evaporation of these exposed water bodies.

Observations: Biodiversity impacts

Pest horse disturbance has trampled and selectively grazed vegetation communities leading to the physical destruction of habitats (Dawson 2009b). The disturbance of streamside vegetation and bogs and fens has lowered the water table and changed (or is changing) the composition of vegetation communities. In an undisturbed state, the valley bottom streams, wetlands and their bog and fen communities include rich concentrations of biodiversity.

Australian native animal species found in these sub-alpine environments include the Broad-toothed Rat; the Eastern Bush Rat; Dusky Antechinus; Alpine Water Skink; She-oak Skink; Mountain Swamp Skink; the Southern Toadlet; Latham's Snipe (an international migratory species subject to the CHAMBA and JAMBA agreements); the White Lipped Snake; Mountain Copperhead Snake; Flame Robin; Freshwater Crayfish and many invertebrate species. These Australian native species are all dependent on these sub-alpine habitats being healthy.

Observations: Impacts to Endangered species and Endangered Ecological Community

The She-oak Skink, an *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* listed endangered species and a species endemic to the Australian Alps is known from the subalpine grassland environments of Cascades Creek. The Australian Alps is the only place in the world where this species is found and its habitats are being impacted. In addition, the alpine and sub-alpine bogs and associated fens so disturbed by the horses are an *Endangered Ecological Community* listed under the Australian Government's *EPBC Act 1999*. Pest horses are officially recognised as a potential threat to this species and to this ecological community. Our observations identify that they are a destructive threat.

Conclusion

Based on our observations of the 22 and 23 March 2013, the impacts of pest horses in the Pilot Wilderness of Kosciuszko National Park were much greater and more pervasive than we had witnessed in over 40 years of intermittent observations. Horses are estimated to have substantially impacted more than 43 kilometres of the high mountain headwaters of the Snowy and Murray Rivers and their commensurate sub-alpine streamside habitats for Australian native species. These impacts are affecting water flow regimes, water quality and water yield of catchments of vital importance to the environmental flows of the Snowy River and downstream water users in Victoria; and, they are affecting the headwaters of the Murray River. The grazing, trampling, compacting and soil pugging impacts were observed to have enhanced erosion of stream banks, bogs and fens and have directly impacted habitats of rare, threatened and endangered Australian native species and could help lead to the loss of Australian species. There are too many pest horses; they are increasing in numbers; they are excessively impacting Australian native animal habitats and they are severely degrading the headwaters of our most important rivers. We conclude that urgent and effective action is needed to end forever these pest horse impacts; to restore the damage to the water catchments and to help conserve Australia's native species.

End Note

Both authors have the highest regard for horses and appreciate and support their place in most areas of Australia such as farms, towns and sporting tracks. We understand, appreciate and share the delight and companionship horses bring to many people. This report is not an attack on horses per se. Rather; it is about raising awareness of too many horses and unacceptable and excessive impacts in one of Australia's most important conservation areas, the Australian Alps national parks.

Acknowledgement

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Pest Horse damage to stream banks, Ingeegoodbee River, near Tin Mine Hut, 23 March, 2013 (Source: Graeme L. Worboys).