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Australian Brumby Alliance (ABA)

Brumby Resource Information-3.8

Brumby Water Quality & Erosion Concerns

Most, if not all, National Park and government agencies list the many impacts that they are convinced are caused by Brumbies (Wild Horses). Of the impacts claimed, this ABA paper reviews the claims that Brumbies or Wild Horses cause the following negative impacts:

- Degradation of waterways, reduction in water quality, trampling of stream banks;
- Contamination of drinking water by stream bank damage, their faeces and fouling waterholes;
- Disruption of soil structure in wet areas, soil entering streams, erosion, water ponding and opportunities for the establishment of weeds [ABA paper 3.7 reviews weed claims];
- Potential to transport Amphibian Chytrid between waterbodies/catchments; and
- Raise water supply catchment concerns about *Cryptosporidium parvum*.

With so many impacts often blamed on a Brumby presence, it is not surprising that the more people who read about these claims, in the absence of easily accessible counter arguments, the more likely the public are to come to believe, without question, these claims must be true.

Adda Quinn (1998) researched the potential risks of horse manure, and concluded; *The chemical constituents of horse manure are not toxic to humans. Horse guts do not contain significant levels of two waterborne pathogens of greatest concern to human health risk, Cryptosporidium or Giardia, neither do they contain significant amounts of the bacteria E. coli 0157:H7 or Salmonella.* [Ref-1]

The claims that Brumbies reduce water quality, damage stream banks and cause erosion are not justified where *sustainable* Brumby populations are grazing. Furthermore, these claims are *insignificant* compared to the extent and severity of impact damage that has been caused by, for example: severe fires, storms, mining and the Snowy River Hydro-electric scheme.

Severe fires and storms are the greatest mover of soil structures into streams [Ref-2]

Too many of any species, whether native or not, such as pigs, deer, goats, foxes, kangaroos, rabbits, wombats, Brumbies, and especially humans, will cause increasing negative impacts.

The ABA and many in the community value their Brumby heritage and are equally firm in their conviction that Brumbies can assist the ecosystems they graze within, provided they are managed in a viable, *sustainable*, humane manner and within a *total threat strategy* program.

1. Degrading waterways, reduced water quality, trampling stream banks

A Griffith University study (Queensland) in 2011 “Detecting stream health impacts of horse riding and 4WD vehicle water crossings in South East Queensland” [Ref-2] found that horse trail crossings are a pulse impact on water quality and small numbers (100 passes) have little long term impact. And “horse crossings produced an increases in both organic and inorganic sediment, E. coli, nitrogen, and phosphorus, but of these, **organic and inorganic sediment, and E. coli were also elevated by 4WD crossings**”. [Ref-2]



Sediment Runoff during 4WD crossing at Numinbah test site

[Ref-2]



Sediment Runoff during Horse Crossing at Numinbah test site

During horse crossings, sediment erosion and displacement occurred primarily at the edges of the stream, while during the 4WD crossing disturbance was higher near the stream banks and erosion was more evenly spread through the width of the stream (see photos above). [Ref-2]

Runoff during storms and floods, especially in Parks downstream of pastures and residential areas, was potentially much greater than anything that occurred during the anthropogenic disturbances captured during the (study) events. [Ref-2]

Horse crossings during the study period were found to add nutrients to the aquatic system to a significant degree, while 4WDs will add whatever is transported in on their undercarriage and tyres, including faecal matter, as well as re-suspend any sediment already present. [Ref-2]

2. Contaminate drinking water by stream bank damage/faeces/fouling waterholes

Adda Quinn’s 1998 research [Ref-1] makes the following key observations;

- Horse manure is a solid waste that neither contains significant amounts of listed hazardous components, nor exhibits hazardous properties,
- In fact, animal manure is a valuable agricultural amendment and has been used for millennia to help grow our food supplies, and
- While E. coli from a number of species, including humans, can cause intestinal disease under certain conditions, those of equine origin have **not** been shown to do so.

"On concentrated reflection, I can come up with no explanation why the horse should be singled out as a likely source of human disease" - Adda Quinn [Ref-1]

In addition, the NAHMS (1998) study "Salmonella and the US Horse Population" confirms that Salmonella is not an issue in horses (www.aphis.usda.gov/vs/ceah/cahm/Equine/eq98salm.htm).

Jeffrey Schaffer, wilderness writer also reported that 700 backpackers contribute about a ton of human waste per week, and in particular that “buried human excrement takes longer (than horse and cattle excrement), for in mountain soils, subsurface decomposers such as bacteria and fungi are not abundant”.

3. Loss of soil structure in wet areas, soil entering streams, erosion and water ponding opportunities for the establishment of weeds.

We are often told by government agencies that Wild Horses cause impacts from their hard hoofs, rolling and the walking tracks they form while grazing. However most species in some way leave their mark: pigs wallow in muddy patches and root deep into the ground as they look for feed, deer will leave hoof marks and humans leave a range of “foot prints”.

For 15 years the author [Ref-12] and others rode horses on a track for 15 minutes at a walk to exit a property and the track never altered in width or depth. However, the tracks ridden where recreational 4WDs and motorbikes were allowed required *grading* each year due to severe erosion. Over the many years of bush riding the author has also observed:

- tracks left by other animals and high impact tracks from 4WDs and motor bikes
- that kangaroo pads may be narrower than that of horse tracks, but cover more of the landscape as they go back and forth across their feeding area

“Runoff during storms and floods” especially in Parks downstream of pastures and residential areas, was potentially “much greater than anything that occurred during the anthropogenic disturbances” captured during the study. [Ref-2 2011 study “Detecting stream health impacts of horse riding and 4WD vehicle water crossings in South East Queensland”]

“Wildfire in 1914 caused little damage, whilst a severe fire in 1925 burnt peat bogs on the high plains and caused *severe erosion*” and “summer fires were the *major cause* of soil erosion and loss of timber in the (Alpine) region” and “Severe wildfires in 1978, 1983 and 1988 caused substantial soil erosion [Ref-3].

The 2003 fires caused loss of human life, unprecedented erosion and siltation of water supply catchments, killed many rare and endangered plants and animals [Ref-3]. Neither (background reviews) recognised that extreme wildfires and mining operations had caused erosion [Ref-3].

The 2003 and 2006 Alps wildfires burnt over 750 000 ha in national parks and reserves, and post-fire floods caused massive erosion areas, creating vast, bare areas and flushed nutrients from the ash beds or deposited sediment *promoting rapid growth* of many weeds [Ref-4].

The 2003 Alpine fires burnt a significant amount of vegetation in the water catchment areas in Gippsland leaving a risk of soil erosion. The fires severely reduced vegetative cover – both pastures and native vegetation – *creating a high risk* for destructive soil erosion [Ref-5].



DPI Victoria [Ref-5] reported that; In February 2003, the regions experienced major flooding, which affected water quality and increased the risk of long-term erosion.

Photo- evidence of erosion after 2003 fires. Erosion and sediment runoff were a major problem posing significant risks [Ref-5].

High and fast flows have caused destabilisation and erosion of river banks, scouring and removing vegetation. Downstream of Jindabyne dam, the loss of fish represents only one revenue loss caused by the (hydro) Scheme, saline intrusion up the mouth of the Snowy River has “caused multiple fish kills and destroyed river bank vegetation, giving rise to additional erosion management and bank stabilisation costs”. [Ref-10]

“Mining in the Australian Alps” [Ref-11] mentions extensive damage that mining caused e.g.:

- Thousands of people flocked to mine sites in the Australian Alps, including Kiandra and Walhalla - increasing after 350 kms of tracks were built to link the goldfields;
- The Australian Alps Bioregion was mined from 1905 to 1930, where hydraulic sluicing and dredging (NSW NPWS 1991) was also introduced;
- Gold mining occurred at Grey Mare for around 60 years with Thredbo and Toolong being mined in the mid 1890’s. By 1920, only Mount Wills and the Ovens River was mined and after area became a national park, only the Red Robin mine continued; and
- The Tin Mines that started in the 1873’s, had several huts on the site and employees built race lines, laid pipes and improved access to support tin mining operations.

4. Potential to transport Amphibian Chytrid between waterbodies/catchments

The frequent use by national park and government organisations of words such as *could, may, can lead to, has potential to, has concerns about*, when listing impacts they say are caused by Brumbies *is misleading*. We need comprehensive studies to identify precisely how, when and why impacts occur, not *possibilities* that Brumbies are the sole cause - *research all causes*.

For example, Parks Victoria website states “Wild horses have the potential to transport the amphibian chytrid fungus between bodies of water including catchments” and then add “This highly transmissible fungus results in disease that has caused the decline or extinction of up to (frog) 200 species”. Many readers would be led to conclude that therefore it is Wild Horses that are responsible for introducing this disease and causing decline or extinction of frogs.

However, “human activities” in the 1986s and 1987s [Ref-7] unintentionally introduced the Amphibian Chytrid, then it was carried to previously healthy Corroboree frogs as researchers moved from site to site in the Australian Alps [Ref-8]. Healthy **Common Eastern Frogs** then became a carrier of this disease [Ref-6], passing it to corroboree frogs they co-habituated with.

The Common Eastern Froglet is the only Australian Alps frog species to not show any sign of major decline – another study found that “*this species is an abundant reservoir host for the amphibian chytrid fungus* in areas occupied by the critically endangered Southern Corroboree Frog (*Pseudophryne corroboree*) (Hunter *et al.* 2007) [Ref-6]

- Along the east coast of Australia, nine species of frog have totally disappeared in the past two decades, and scientists are at a loss to explain why or provide solutions – except for ‘*human activities*’ and population growth [Ref-7]
- That human activity caused this rapid decline correlates with the monitoring program began in 1986 to survey 23 sites annually. “The abundance of male frogs at these sites declined over 80% *across the first 2 years of this program*”. Then, “to compensate for the loss of sites with frogs, an additional 37 populations were incorporated into the annual monitoring program in 1999. “Over the following 4 years, the abundance of frogs at these sites dropped by **75%**” and 25% sites becoming locally extinct [Ref-8]
- Department of Environment reported (2012) that they had mitigated any significant impacts from feral herbivores (horses and pigs) on the Southern Corroboree Frog after

successful programs were conducted to trap horses [Ref-8]. But the *decline continued*, unabated, and a report involving several NSW government departments later found that the Southern Corroboree Frog was close to extinction in the wild, and “in January 2014 only six males were found and no eggs were found in their nests” [Ref-9].

Although the risks from horses were successfully mitigated [Ref-8], the decline continued, leaving only six males with no eggs in their nests, to be found by early 2014 [Ref-9]

5. Water supply catchment concerns about *Cryptosporidium parvum*.

While Namadgi National Park [NSW] removes any Brumby found in the park to prevent a perceived risk that a Brumby could transmit *Cryptosporidium parvum* into the water supply catchment area, their fear is unfounded. Research reports that:

- Horse manure is a solid waste excluded from federal regulation because it neither contains significant amounts of listed hazardous components, nor exhibits hazardous properties [Ref-1].
- Detecting the organism’s presence in water does not indicate that it is viable (capable of inducing infection). Oocysts of *C. parvum* are present in many North American waters (0.0002-5,800 per litre) more so in lakes and rivers, less in groundwater [Ref-1].
- 30% of mice tested had *C. parvum* in their guts; similarly 63% of rats, and 11% of feral pigs carried *C. parvum* in their guts - **all significantly higher than those found in either humans or horses.** [Ref-1].

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