Feral Horse Discussion Paper

Damage to Nationally Significant Water Resources and Environmentally Significant Ecosystems
In the Cobberas Unit of the Alpine National Park
Caused by Feral Horses, Pigs and other Feral Animals
Feral Animals as Vectors of Economically Damaging Animal Diseases
Version 3.1[#]

IN A NUTSHELL – EXECUTIVE SUMMARY

Over the past 10 years I have visited the Cobberas section of the Alpine National Park every December and numerous other times. I have a general interest in nature but I am not an expert, nor do I know as much about the Cobberas as many others.

I have read relevant documents, and spoken to locals and others that have a good knowledge of the area. I conducted a brief random survey of snow meadows 26 & 27 February 2007 to assess the presence of feral horses and pigs.

I once thought the impact of brumbies on the environment of the Cobberas area was relatively benign. They tended to keep to the higher, often rocky, ground. Their track networks whilst obvious and extensive are relatively narrow. The brumbies tended to avoid the wet and boggy snow meadows preferring to keep to their dryer/higher edges.

What has galvanized me to raise this issue is the severe damage that has recently been inflicted by brumbies and pigs on the wetter areas of the snow meadows and sphagnum bogs, including the western end of the park in and around the snow meadow known as the Playgrounds.

In the Playgrounds the snow meadow have been heavily grazed and like most other places in this section of the National Park, there is horse dung everywhere. The Playgrounds snow meadow was more like a horse paddock, than the Playgrounds I knew. More recently extensive damage has occurred to stream edges and wetter areas around them. These were all disturbed by horse trampling, were muddy and broken down/eroded and the streams were showing signs of silting. In some cases pigs and horses have combined to demolish extensive slow forming sphagnum bogs in and around the playgrounds and elsewhere. Everywhere once slow moving water flows now run in narrow strait channels formed by horse grazing, trampling and pugging.

In the Playgrounds the claws and body parts of dead/dismembered of the Alpine Spiny Crayfish – Euastacus crassus (FFGA listed), were found along stream edges in areas of extensive house trampling of stream banks, etc. [Refer to DSE action Statement 136]

Fellow members of the Australian Native Orchid Society (ANOS) who have seen this damage are particularly concerned about the heavy tramping and grazing on the areas in which the FFGA listed Marsh Leek Orchid Prasophyllum niphopedium grows [Refer to DSE action Statement 167] and about the damage to the meadows, sphagnum bogs and stream edges where a number of other rare and important orchid species grow for example the Alpine Sun Orchid - Thelymitra alpicola (AKA Thelymitra erosa subsp. 2)

Concern has been expressed about stream edge wet heathland and sphagnum bog damage:

- at known sites of the critically endangered Alpine Water Skink– Eulamprus kosciuskoi which “inhabits sphagnum moss beds and adjacent wet heathlands along alpine and sub-alpine drainage lines.” [see DSE Action Statement 114]
- the populations of the Broad Toothed Rat – Mastacomys fuscus known to exist in this area. [see DEC NSW Threatened Species Website].

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I haven't sufficiently researched other impacts however among the many other rare, endangered or important species researchers say are likely to be impacted by feral horse and pig activity are the Alpine Tree Frog (at Davies Plain an area that is reportedly suffering from heavy horse presence) and the Alpine Bog Skink.

Alpine and subalpine bogs community habitat are themselves threatened habitat.

Those who know the area report seeing far more brumbies in recent years than previously.

The presence of pigs is insidious. They are rarely seen. The signs of there presence (rooting) is everywhere. They are very hardy animals who can live in the snow, and have the ability to bred-up very quickly. The Cobberas snow meadows and bogs provide a readily and almost endless supply of nutricius pig food. The ability of, even one rouge pig, to permanently damage the Cobberas fragile ecosystems, is great.

I also see deer, rabbits and hare. Sometimes feral animals outnumber the natives!

This raises the question of whether it is appropriate to have such a high level of feral animals in a National Park? As in " What are we managing here, a National Park, or a reserve for feral animals?"

When the local Member of Parliament is quoted in the media as saying words to the following effect:

> *What's the point of removing cattle from the National Park, if you don't do something about the feral animals?*
> *You might as well put the cattle back in.*

He is merely expressing a sentiment that is widely held in his community. Locally horse damage in alpine areas has been well understood.

Many of those involved on both sides of the Cattle removal argument refer to an understanding that once cattle were removed horse numbers would be controlled. Regrettably this has not occurred.

Sections of the community have great affection for brumbies and that, in terms of feral animals, puts them a different category to other feral animals including men's other best friend, feral dogs. This affection should be respected. The control measures proposed take those concerns into account, and adopt the Code of Practice recently developed in NSW by Dr English.

Locally Parks Victoria (and DSE) adopt a community-focused approach to dealing with feral animals and pest weeds. They have been most successful in dealing with such issues when there has been a dedicated person to work with the community on an eradication/control program, and where there is ongoing commitment to adequate funding and maintenance of that person's position. An example of this is the effective, and locally popular, English Broom Eradication program now underway.

The same community based model has been adopted for feral pig control with a (locally well regarded) dedicated pig person running a pig control program in the Cobberas section of the park, and on private land on the edge of the park.

As was found in NSW, the eradication of pigs from mountainous, high altitude, remote terrain is a very difficult, and often frustrating task, that requires both patience and persistence.

In the case of feral horses we are looking at a situation in which the current management practices are not achieving the objective of protecting the delicate ecosystems and threatened species of the National Park.

It is not that the management practices or methods that have been adapted are inherently bad. They are not. Rather, I think that in the light of what has happened, they need to be urgently reviewed.

In my March 2007 version of this discussion paper I wrote:

That such a review may well lead to:

- *An increase in removal targets, and a focus on removal of brumbies from the sensitive valley snow meadows in and around the playgrounds;*
- *A continuation of the brumby running, capture and remove method;*
- *Other capture and remove methods being established; and*
- *Consideration of fencing or other measures to protect the most important sites.*

Since that version, some steps have been taken to trial/introduce other methods such as trap yards and increased removal targets in the Bogong High Plains, which has been given priority.

Regrettably funding has prevented these much needed measures being implemented in the Cobberas Unit.

There is ongoing need for cross jurisdictional co-operation:

- Feral horses occupy a total range that extends into both NSW and Victoria to cover most of the headwaters of the Murray and Snowy Rivers.
- Feral pigs have moved down from NSW into the Snowy river Valley where they have breed up and moved both (a) into the Cobberas; and into (b) the private and public land in the rich valleys along the Barry Way, and are rapidly extending down towards Buchan. Farmers in these areas are extremely concerned about this development.
- In NSW an effective pig control program exists for inter alia areas east of the Kosciuszko National Park.
- Currently there are no measures in place to control the populations of feral horses and pigs in areas outside National Parks east of the Cobberas.

In the long term, unless effective steps are taken to reduce the feral animal populations outside of the National Park, and prevent their movement into the park, then the benefit of any successful program operated in the Park will be negated by movement of these outside populations into the park. It will be like trying to drain the sea.

Across East Gippsland (including the Cobberas) we are seeing the build-up in the populations of rabbits and deer. Deer are extremely hardy, hard-footed animals. They eat almost anything, in particular, the native plants of our rainforests and wet gullies.

Damage to snow meadows and sphagnum bogs has implications for our ability to provide a sustainable high quality water resource. Feral horse and pig damage to the location known as The Source of the Murray River is indicative of the wide spread damage caused to our national headwaters.

Feral animals are vectors for exotic diseases. Pigs and deer can carry foot and mouth disease. If there is an outbreak, they cannot be quarantined, or destroyed. The recent outbreak of equine influenza highlights the implications for our economy if that disease or another horse disease spread into our unquaranteenable feral horse population.

The following pages contain further notes on, and discussion of, these matters.

Bill Kosky
March 2007
Revised and updated February & March 2008

NOTES AND DISCUSSION

1 CONTEXT, METHODOLOGY

Sources, Assumptions, Approach

In preparing this discussion paper:

- *I have spoken to many people both inside and outside DSE, including locals and Pam O'Brien the NSW National Parks area manager responsible Kosciusko National Park (O'Brian). Generally I have treated the information provided as confidential.*
- *On 26 & 27 February 2007 I conducted a random survey to determine the presence of feral horses and pigs at a cross section of accessible snow meadow locations.*[1]
- *I have circulated a draft discussion paper to various parties and incorporated helpful comments and corrections in this final draft*
- *I partially revised and updated this paper in February/March 2008 so that it provides reasonably up to date background reference material and discussion*

There is a useful suite of reports and papers centred around a joint inter-government initiative and actions brought together by a body called the Australian Alps National Parks which gives an overview of the issues problems and potential solutions across a range of jurisdictions and deal with brumbies in Australia's high country.

Arising from that is perhaps the most informative general document namely the "Horse Management Plan for the Alpine Area of Kosciusko National Park January 2003-2005" (I understand it may now be superseded by a new plan).

Other important information is contained in a summary paper "The Population of Feral Horses in the Australian Alps" prepared for the Australian Alps Liaison Committee in April 2005 by Michele Dawson (Dawson) a population ecologist. This is a summary of her 1999-2001 doctrinal paper and deals horse populations pre the 2003 fire with some post fire commentary. Whilst out of date, and significantly, lacking any assessment of hose number post the 2003 fire and cattle removal, it never the less provides much useful information and demonstrated the value of horse population studies as an aid to horse management. [2]

Dr A. W. English a veterinary scientist has prepared a Code of Practice for the Capture and Transport of Feral Horses. I assume that any contract for the capture and removal of feral horses will require adherence to those guidelines.

National Parks NSW have been reviewing its horse management practices and I understand have, or are about to. implement a new plan and/or practices.

I assume the reader may have read some of these publications, or is familiar with the issues and management options. Generally I adopt the findings and conclusions of these documents without making direct reference to them.

The comprehensive "Report of the Investigation into the future of cattle grazing in the Alpine National Parks by the Alpine Grazing Taskforce March 2005 also deals with similar issues. Essentially the post cattle removal and post fire build-up of feral horses replicates the situation created by cattle in the High Country, save that cattle grazing

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1 Details of my survey results, including GPS locations and photographs, are available on request.

2 The summary paper can be obtained at – www.australianalps.deh.gov.au/publications/feral-horses/index.html. Others at - www.nationalparks.nsw.gov.au - search"feral horses".

only occurred in the summer months, and a licence system controlled the number of cattle at any one location.

In respect of the areas of the Cobberas I know well, from before cattle removal, I am of the opinion that the damage I now see being caused by feral horses, is far worse than the damage I saw, caused by cattle grazing. In particular the extensive damage to the bogs, stream edges, and wet areas depicted in my before and after photos. As my before photos show, these places largely survived many decades of cattle grazing, but are now being destroyed by feral horse and pig damage.

Population Numbers
The fact is that whilst there are methods to accurately measure horse (and perhaps pig) numbers in small areas, there is no effective practical means of accurately measuring the total horse and pig populations of larger areas. (per O'Brian and others)

It is relatively easy to assess the presence of horses at any given location by the presence of horse dung and tracks. To asses the presence of pigs by looking in likely locations for signs of pig rooting.

One can date horse dung, pig rooting, and sometimes horse tracks, as recent or old.

The density of horse dung, and the intensity of grazing gives an indication of horse numbers, and the extent of rooting some indication of the number of pigs an/d or the length of their presence.

The Cobberas area
The area I refer to as the Cobberas is the area of the Cobberas section of the Alpine National Park where brumbies are present. It covers an area from around Mt Pinibar/Tom Grogan, Davies Plain and Limestone Creek in the west, through areas around the Mts Cobberas, Forlorn Hope, Wombargo, to the Barry Way and the Black Mountain/Gelantipy area the east.

This area is the southern extension of the Kosciuszko National Park, having similar habitat, and only separated from it by, in part, the Murray River (which is a mere stream at Cowombat Flat) and, in part by a survey line that denotes the state border.

This area ranges in altitude from 900 to 1,900 metres. Its habitat is mostly various forms of sub-alpine habitat with some alpine habitat at higher altitudes.

The characteristics of the Cobberas that distinguish it from other sub-alpine areas are its open forests, with very few mid story plants and a grassy or herby ground cover. That is, a forest in which it is relatively easy to walk in, or ride a horse through. These forests are interspersed with a mosaic of large and small grassy snow meadows, which contain, wet marshy areas, small streams, sphagnum bogs, small woody scrubs, daisies, orchids and other herbs.

These snow meadows, in particular the wetter areas and bogs, support a number of rare and endangered fauna and flora species including the FFGA listed species described elsewhere and things such as the Broad Toothed Rat and the elusive and little known, EPBC listed, Smoky Mouse.

There are essentially two types of snow meadows:

- Elevated Snow Meadows
  Those located in positions, which in relation to surrounding country, are elevated. That is on plateaus or positions on or near higher ridges. These elevated snow meadows are generally without permanent stream water although many have soaks and springs around which and sphagnum bogs and other wetland vegetation grows. Many of the snow meadows on the eastern end of the

Cobberas, in particular those along the Benambra-Black Mountain Road from Emu No, 1 plain to the complex of snow meadows around the ridges below Mt Wombargo, are elevated snow meadows.

- Valley Snow Meadows
  Those located in depressions or valleys. These valley snow meadows usually contain sphagnum bogs and have a permanent stream running through them. For instance, those at the western end of the Cobberas in and around the playgrounds located along the Buchan River, its tributaries and the Limestone Creek.

The valley snow meadow called the Playgrounds at the foot of the Mts Cobberas is perhaps the largest, and arguably, the most important of these alpine meadows. It is where the Buchan River begins

All these snow meadows are delicate ecosystems and easily damaged. The stream edges and bogs are particularly fragile. Once damaged they don't easily recover. For example one can still see car tracks made 20+ years before that haven't yet recovered.

Climate Change
It is predicted that climate change will in future see warmer temperatures in our alpine areas, and less rain and snow.

This is likely to reduce the ability of these alpine and sub-alpine areas to sustain their present plant communities and fauna. That we will see some breakdown of the physical environment that supports them. More importantly climate change is likely to reduce the already limited ability of these ecosystems to recover and regenerate.

The implications for brumby control is that it is likely the brumbies will be able to move to higher altitudes and maintain their presence in higher alpine areas for longer periods (eg; move into higher altitudes and for longer periods.

It is likely the phenomena of the alpine meadows in the Cobberas drying out, and becoming hard, will occur with increasing frequency. That, particularly if horses and pigs break down, erode and otherwise cause them to lose their water retention capacity.

Fire, Feral Animals and Damage to Sphagnum Bogs (AKA Moss Beds)

On 17 April I attended a very interesting lecture given by Neville Walsh on the response of Alpine Vegetation to Bushfire. Neville showed photographs of some sphagnum bogs on the Buffalo Plateau that had burnt during the recent bushfires. Some photos showed that sphagnum beds had been burnt and the fire had burnt down into the underlying they peat beds, exposing underlying soil/gravel. He said this was significant because the common wisdom was that sphagnum bogs don't burn in bushfires. These bogs had apparently been subject to a series of bushfires that occurred at Buffalo in 2003 and 2006. He also described and showed photos of the very common phenomena of bushes on the open grassy snow plains of bushes burning/exploding as the fire passes over them leaving a circle of burnt ground in the otherwise fairly intact surrounding groundcover.

Generally speaking the sphagnum in these bogs is full of water and (like a wet sponge) won't burn. I suspect the burnt examples may have been subject to a succession of fires, may have dried out, or otherwise may have been damaged. The sphagnum bogs I know around Cobberas are fed by springs and soaks and I have not seen any intact bog dried out, even in dry times.

The Cobberas bushfire was in 2003 and whilst there were some very hot fires mainly on north/western slopes, the burn elsewhere was mosaic with many parts including snowfields and sphagnum bogs having a fire that passed through the mid storey leaving the upper storey and groundcover vegetation reasonably intact. Some bogs were in

areas only moderately or lightly burnt, and others in unburnt areas. Certainly I have not encountered any bogs extensively burnt as in the Buffalo photos.

Many of my photos show sphagnum bogs containing the burnt remains of bushes which were burnt in the 2003 fires. However this an example of the burnt or exploding bush phenomena that generally leaves the ground around it relatively intact. In most cases the sphagnum bogs in the Cobberas were little affected by the fire. There are some examples of partial exceptions to that:

- In the case of one of the sphagnum bogs on the track from the playgrounds up to the ridge of the Cobberas the damage was more severe than merely having the bushes growing in it burn/explode. In this case the heat of the fire had in fact singed or burnt off parts of the green sphagnum growing on the surface of the moss beds causing these parts to brown-off and die back. It was as if parts of this sphagnum bog had been sunburnt. I suspect that over time these singed areas would naturally regenerate, and the sphagnum bog itself be very little affected. However there was considerable pig activity at this location and I think the pigs took the opportunity created by these sunburned areas of sphagnum bog to move into them and then to begin to demolish the rest of the bog. I have an additional set of photos showing this and also that after the pigs opened up this bog, the horses moved in and damaged it further.
- The centre of the large sphagnum bog at Rocky Plains is extensively damaged with fairly large areas of horse trampled mud and other recent horse damage. Bushes within it were extensively burnt in the 2003 fire. I did not see this bog immediately after the fire. It is possible that part of the damage at a centre of this bog was caused by fire. If this is the case, I strongly suspect the fire has been able to take hold at this location because it had been damaged and opened up, making it more likely to burn.

I think the lesson to be learnt (and/or further investigated) is that:

- Bogs may be superficially damaged by fire, but will naturally regenerate unless horses and/or pigs are present in which case the damage creates an opportunity for pigs and/or horses to move in and start to open up and damage the bog.
- Bogs that have been damaged/opened up and perhaps partially dried out, as a result of damage by pigs or horses (or previous fires?) are more likely to burn than intact bogs.
- On rare occasions when bogs do burn, it would be worthwhile examining history of the bog to see whether it had been made more susceptible to fire as a result of damage or changes to it, by animals, previous fires, or something that had cause it to dry out or otherwise be more susceptible to fire.

The Cobberas as a Water Resource

The Cobberas contain the headwaters and many upstream tributaries of the Murray River (Limestone Creek) and major Snowy River tributaries (Buchan, Suggan Buggan, Little River, etc.).

Alpine meadows act as large sponges absorbing the winter rains and snowmelt slowly releasing water into streams in periods of low rainfall. Extensive damage to these meadows destroys their water holding capacity, creates erosion and silting into streams flowing through and out of them, and can have extensive impacts not only on downstream ecosystems, but on the provision of a reliable quality water supply.

If the water retention qualities of the alpine meadows and bogs are broken down we will end up with a situation where in the dryer months permeant streams will be replaced by silted watercourses that only flow (flush) after rain.

Water Quality and Resource Management

The water resources in Murray/Snowy headwaters are major a national water resource. Climate change and the continuing presence and build-up of brumbies, pigs and other

feral animals is likely to negatively impact on the ongoing sustainability of this resource.

This factor needs to be recognised and there needs to be direct liaison, coordination and cooperation with all authorities responsible for managing both catchments and our national and local water resources.

Nothing could be more symbolic of the impact feral horses and pigs are having on our water resources than reports of the impact they are having on a wetland area of springs, soaks, bogs and swamps known as The Source of the Murray. The Source of the Murray is located on the border near the north-eastern end of Cowombat Flat. It is, or was, a swampy area containing springs and soaks. It is reported that feral horses and pigs are present in some numbers. That they have moved into the swampy areas, destroyed much of its vegetation, and turned the area into a muddy patch.

Sustainability of the National Park

Because Cobberas area has the qualities described above it has been included in the Alpine National Park. Considerable amounts of public money is spent managing, conserving and enhancing this National Park so that amongst other things:

- it may be enjoyed by current and future generations of Victorians, other Australians and overseas tourists; and
- to preserve specie diversity in accordance with Australia's international treaty obligations, Federal and State arrangements, and State policies and management plans for the conservation of specie diversity which particularly focuses on rare, endangered and threatened species and ecosystems.

Those arguing to maintain the present number of brumbies in the National Park must realise that this public money is not spent to sustain it as a reserve for the feral horses, nor to provide for recreational brumby running. At least, not at the expense of maintaining their environmental value, species diversity, public enjoyment/recreation and a sustainable water supply.

2003 Bushfires

In January 2003 extensive bushfires swept through the Kosciusko and Alpine National Parks and down the Snowy River Valley. Many areas surrounding the Cobberas were severely burnt, as were some parts of the Cobberas. However the burning in the Cobberas was more mosaic and most of the areas in which I have seen brumbies (including the playgrounds and other alpine meadows and along the Limestone Creek and elsewhere) generally either avoided being burnt, or were only lightly burnt.

Removal of Cattle Grazing

Following the 2003 bushfires the Victorian Government made the politically brave decision to discontinue summer cattle grazing in the Alpine National Park on the basis that such activity was incompatible setting aside an area as a National Park and citing extensive scientific evidence as to the environmental damage caused by this activity.

The very comprehensive Report on the Future of Cattle Grazing in the Alpine National Park by the Alpine Grazing Taskforce inter alia concluded:

1. *Cattle damage water catchments, causing bare ground, soil disturbance and erosion, and trample moss beds [ie; Bogs] and watercourses.*
2. *At least at a localised level, grazing adversely affects water quality.*
3. *Grazing modifies and damages vegetation in the park, with the Taskforce finding the evidence of damage caused by cattle to moss beds and snow patches to be compelling.*
4. *Cattle grazing is considered a significant threat to at least 25 flora species, 7 fauna species and 4 plant communities found in the park that are listed as rare, vunerable or threatened with extinction.*
5. *Cattle have contributed to the establishment and spread of several weed species.*

6. *On the evidence before it, the Taskforce concurs with the conclusions of the 1998 Groves report, that the scientific research is adequate and consistently reveals that grazing has deleterious effect on biodiversity.*
7. *Rehabilitation and restoration necessary to repair modified and damaged areas is very difficult with continued presence of cattle.*
8. *The Taskforce finds significant damaging impacts and no overall benefits of the environment from cattle grazing in the Alpine National Park.*

Chapter 3 describes the impact of cattle grazing. In my opinion the same damage, and same impacts, are now being caused by horses and to a lesser extent, pigs. Read it for yourself. Compare impacts described in it with the horse impacts described above.

The opposition to removal was locally extensive, well organised and funded. Its campaigning was very vocal/visible attracting a great deal of media attention. The State opposition campaigning heavily against removal of cattle grazing. The Federal government of that time, particularly its Environment Minister made much of the issue in support of the continuation of cattle grazing, even threatening to intervene via a Heritage Listing of high country cattle grazing.

However the Victorian government held its ground, and cattle no longer graze in the Alpine National Park.

Issues relating to Multiple Jurisdictions
There has been a concerted effort to maintain contact and co-ordination between State and Federal and Territory governments, and between their relevant agencies. I do not know the full extent of this liaison. However it appears to me that this, and other considerations of the feral horse problem has mainly addressed feral horse issues within National Parks. As if feral horses only existed within, and didn't move into, and out of, Nation Parks

This co-ordination and liaison needs to be ongoing and should to be extended so that there is liaison and co-ordination on both horses and pigs across the whole of Murray/Snowy headwaters as described in this paper, not just National Parks.

Feral animals as disease Vectors
Feral pigs range all the way from Cape York down into Victoria. Likewise deer have an extensive range. Feral animals can be carriers of local and exotic diseases that can decimate our sheep, cattle and live stock industries. For example pigs and deer can carry foot and mouth disease.

When such diseases enter the country, infect livestock, or move from one part of the country to another, it is a relatively easy matter to control domestic livestock movement and quarantine/destroy infected stock. That is, because they are in controlled herds (ie; behind fences, etc.).

On the other hand it is impossible to stop the spread of disease via feral animals, particularly where numbers, breeding and movement is not limited by effective feral animal control and eradication programs.

No wonder the farmers being subjected to the movement of pigs down into their areas, are so concerned.

The recent outbreak of equine influenza highlights the implications for our economy if that disease or another horse disease/ailments got into our feral horse population. This outbreak seems to have been controlled by strict and economically costly quarantine procedures. It would not be possible to use quarantine controls if a disease or virus moved into Australia's extensive feral horse population.

3 THE TRIGGER FOR MY CONCERN

In my visits to the Coberas in October, November, December 2006 I encountered a phenomena I had not previously seen in December. The usually wet areas of snow meadows were dry and hard underfoot as a result of an exceptionally dry winter. (This phenomena did not occur prior to the 2003 fires.) In addition a number of unseasonable frosts and snowfalls in the spring had killed, or burnt off, much of the usual ground cover in the forest areas.

In 2006 I did not go into the Playgrounds until early December. When I did I was shocked at what I saw.

I had seen very few horses in the playgrounds before, but plenty of signs of their presence. By reading their tracks I could see that they had kept out the wet snow meadows preferring the higher and dryer edges of the playgrounds. Where they could not avoid crossing a small stream they did so at the best and easiest crossing point without lingering around the stream or is edges, thus limiting damage to stream edges.

In December 2006 it was quite different. A mob of horses was seen on the playgrounds and another mob in a nearby smaller meadow. The meadows themselves had obviously been heavily grazed and there was horse dung everywhere. The meadow was more like a horse paddock, than the playgrounds I knew. The many ponds scattered throughout the meadow and the numerous rivulets and streams were dry or drying. These were all disturbed by horse trampling, were muddy and broken down/eroded and the streams were showing signs of silting.

In the playgrounds there are some signs of horse damage to the edges of sphagnum bogs, which were also showing signs of stress from the dry conditions.

I then visited a meadow about 1 km along the track west of the playgrounds. This is a smaller meadow, which is circled by a fairly large sphagnum bog. Again a mob of horses were seen at this meadow. The eastern section of the surrounding sphagnum bog was severely damaged. (This is the part of the bog in which the Veined Sun Orchid, Thelymitra cyanea grows.)

Whilst horse trampling was evident, the extent of damage was different from, damage one would usually associate with horse trampling. This type of wholesale demolition of the sphagnum and ploughing of the mud could only be done by pigs. Pig trotters were clearly identified in the mud, and there were also scats, which I assume were pigs scats.

Friends who visited the playgrounds in early February 2007 took photos showing further demolition of the eastern section of this bog. By the time I visited this spot on 27 February 2007 this eastern section (about 85m long and varying between 5-22 m wide) had mostly been demolished and the pig (I assume it was a single pig) had moved to the edges of the next section, and was beginning to demolish it. Horses had moved into the area of demolished bog and trampled it into a flat, muddy and pugged patch of bare earth.

On my February 2007 survey I also saw pig and horse damage to another sphagnum bog at 1,450 m altitude on the track up from the centre of the playgrounds to the mountain peaks. This seemed to be as much horse damage as pig, but there were plenty of signs of pig rooting at this location.

My random survey identified pig damage to 2 other meadows near the playgrounds.

The only pig damage to the playgrounds my random sampling detected was a neat rectangular area of rooting measuring 3 x 4 m in the south east corner.

Over the period November 2006 to February 2007, larger mobs of horses were seen on Native Dog Flat, the Playgrounds, and the meadows along Limestone Creek . All these areas were heavily grazed.

I must emphasise that this is not a situation where we need to be establishing exclusion plots to establish the (subtle) damage being done. This is the case of wholesale self-evident damage to these delicate ecosystem being caused by feral horses and pigs.

Revisiting the area again in December 2007 and January 2008 I was again shocked to find that even more extensive damage had occurred. This time the horses had moved into and created heavy tramping and grazing damage to extensive areas of stream edges, stream edge vegetation and swampy stream edges, bogs and soaks. There have been reports of similar extensive stream edge damage at Forlorn Hope Plain and elsewhere.

I have photographs going back to 2002 showing the increasingly destructive nature of this movement into, and destruction of areas that previously horses generally avoided. [See photos on my CD]

Channelisation
I refer to the process whereby water seepage and slow moving water flows are transformed to faster moving water flowing in straight drain like channels as chanelisation. The following is a description of it conveyed to one interested party:

I was in the Cobberas area from 7-10 March 2008.

I again visited Cowombat Flat. There horse damage was far worse last weekend than in mid February. I also visited Native Cat Flat and Rocky Plains. The transformation from water flowing slowly through marshy vegetation to a fast flowing spoon drain (or channel) by horse tramping and pugging was most evident at both. It is becoming a reoccurring theme.

The process of how a flat area covered with wet vegetation is transformed into a spoon drain channel is evident at most places throughout the Cobberas in particular where one is able to directly compare those with nearby locations where horses are excluded.

It goes something like the following. First the wet vegetation is removed and the effected area becomes a flat muddy area. Then other vegetation types grow on it(in many cases an alpine sedge most palatable to horses). The water begins to flow in narrow shallow depressions following contours. The edges of these are grazed and pugged. Continual grazing and pugging compresses the soil at the edge of the stream. Some soil is carried away. A meter or so out from the edges of the stream small mini cliffs are created by trampling/pugging and a spoon drain channel is created. Eventually all the finer top soil is carried away and a courser stream bed is formed in a deeper depression with eroded edges.

The Friends of the Cobberas have conducted a 10 year controlled photo survey this phenomena and other effects of horse damage.

At the far North West end of Rocky Plains (tucked away around the corner) is a further extension of Rocky Plains. In had a sphagnum bog of (I estimate) some 8 hectares. Of that some 60% has been removed completely 20% is badly damaged 10% has some damage and only 10% around the edges is undamaged. All caused by horses. At the eastern end of Native Cat Flat a relatively large sphagnum Bog had also been destroyed by horses. I have photos of all this.

It is all a terrible shame, and completely inconsistent with the purpose of a National Park. How long can the Parks Victoria and the Minister allow this ever worsening situation to continue?

Rare and threatened species

In 2007 we found the remains of 4 of the FFGA listed Alpine Spiny Crayfish – Euastacus crassus close to streams in the southern and central parts of the playgrounds. These remains were in areas of house trampling of streams stream banks and edges, with plenty of horse dung to contribute nutrient to the stream. [Refer to DSE action Statement 136] Likely causes of this phenomena are:

- trampling and other disturbance of streams, stream banks, and edges;
- alteration of water quality and temperature

either impacting directly to kill crayfish or making them more vulnerable to predation, and/or:

- natural predation; and/or
- the defence reaction of shedding claws.

The FFG Act Action Statement for the Alpine Spiny Crayfish identifies damage to stream and stream bank integrity, increase in sedimentation and turbidity, and increased nutrient concentrations as threats.

Fellow members of Australian Native Orchid Society (ANOS) who in early 2007 saw this damage were particularly concerned about the heavy grazing on the areas in which the FFGA listed Marsh Leek Orchid Prasophyllum niphopedium grows [Refer to DSE action Statement 167] The action statement for the Marsh Leek Orchid specifically refers to grazing by horses, soil disturbance and pugging by feral horses and pigs as a threat, and feral animal control as an appropriate conservation measure.

ANOS members are also concerned about damage to the meadows, sphagnum bogs and stream edges where a number of other rare and/or important orchid species grow. For example, the Alpine Sun Orchid – Thelymitra erosa subsp. 2 (AKA Thelymitra alpicola) which according to Jeans & Backhouse is “probably vulnerable” and is threatened by horse trampling and grazing.

In January 2008 ANOS members found a new Marsh Leek Orchid site containing 3 new closely located populations at the Playgrounds in a wetter/swampy area of heavy horse trampling. This area once produced massed displays of Veined Sun Orchid -Thelymitra cyanea along stream edges, but these had been removed by horse activity. At these new locations there were clear signs direct damage to Marsh Leek Orchid plants by horse activity. As the we approached this site a group of 9 feral horses moved off it and into the edge of a treed area nearby. From time to time this group would venture out of the trees towards them, bellowing and stamping their feet. As we moved off the horses moved back onto the site. [See photos on my CD]

Concern has been expressed about stream edge and sphagnum bog damage at known sites of the critically endangered Alpine Water Skink–Eulamprus kosciuskoi at Forlorn Hope Plains where there has also been extensive damage to streams, stream edges and their associated bog and wetlands. These skinks inhabit “sphagnum moss beds and adjacent wet heathlands along alpine and sub-alpine drainage lines.” [Quote from DSE Action Statement 114]

Concern has also been expressed about the populations of the Broad Toothed Rat – Mastacomys fuscus known to exist in this area. This species “is restricted to subalpine swamp complexes and associated grassland and streamside heath environments” The threats to which include “Degradation and loss of habitat by horse, pigs” etc [Quote from DEC NSW Threatened Species Website]. And about the Alpine Tree Frog (at Davies

Plain an) and the Alpine Bog Skink.

I haven't sufficiently researched other biodiversity impacts however the Alpine Taskforce report lists 25 flora species, 7 species and 4 plant communities (including Alpine and subalpine bogs and other wetland communities) that are rare, vulnerable or threatened with extinction as being significantly impacted by cattle grazing

4 BRUMBIES

There are 300,000 brumbies in Australia. Populations are found on the coast, in the mountains and in the outback. Compared to the magnificent (almost pure bred) brumbies I have seen in Queensland's channel country, the brumbies of the high country are often mangy, ill bred, and misshapen.

If we had a magic wand and could instantly eliminate the 3,000 to 4,000 feral horses estimated to exist in the southern parts of the Kosciusko National Park and the Cobberas then the total population of brumbies in Australia would fall by about 1%. Conversely if brumbies grazing on these alpine meadows eliminate the 100 or so Marsh Leek orchids, or the small numbers of other rare flora and fauna, and the rare alpine habitat/plant communities that only exist in these locations, these spaecies will become extinct and this habitat be lost to future generations.

The population and distribution information provided by the Dawson's 2001-02 study is excellent. However it has 3 limitations:

a The study is limited to data on horses within National Parks;
b The most reliable population data predates the January 2003 fires, the removal of cattle grazing from the Cobberas post the January 2003 fires, and
c The Dawson population data and projections don't take into account brumby removal associated with cattle grazing.

These 3 limitations are discussed below:

a The Dawson Paper only deals with horses within National Parks

The Bigger Picture

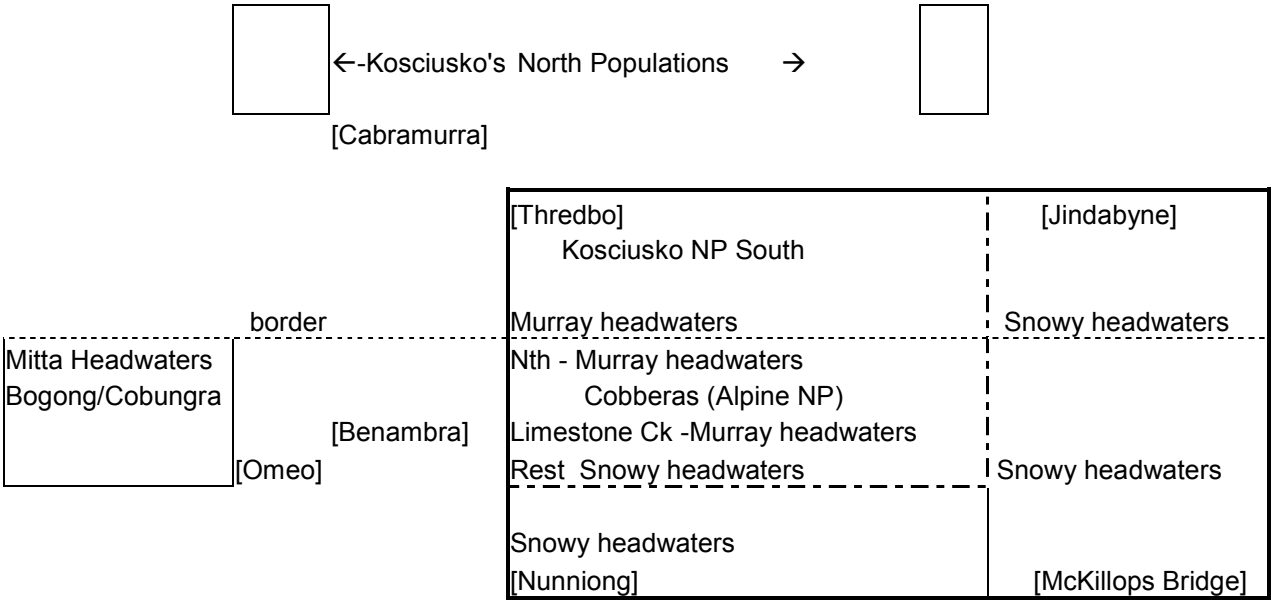
Whilst the immediate issue is feral horses in the Cobberas area, no consideration of this issue can be undertaken without understanding the bigger picture and its implications.

There are contiguous populations of feral horses occupying a range that extends from Kosciuszko and Jindabyne in the north to Nunniong and McKillops Bridge in the south. From Davies Plain and the Limestone Creek in the west, to the Snowy River in the east. There are a number of artificial boundaries and land management jurisdictions/regimes within the total range such as state borders, National Parks, other crown and private lands.

This combined brumby range contains 2 major water catchments, which are in this case the headwaters of 2 major river systems, namely (a) the Murray headwaters (including the former Snowy headwaters diverted to the Murray at Jindabyne) and (b) what is left of the Snowy headwaters.

Accordingly I shall refer to this combined brumby range as the Murray/Snowy headwaters and the feral horse population within it as the combined brumby population.

These headwaters and populations can be represented schematically as follows:



Not to scale
Heavy outline - denotes Murray/ Snowy headwaters & combined brumby population
Dot dash line - denotes population within National Parks
Dotted line - denotes NSW - Vic border
Light outline - shows nearby populations

There is no reliable current information on feral horse numbers in and around the National Parks within the Australian Alps.

Dawson in her 2001-02 study estimated there to be some 1,400 feral horses in the in the southern part of the Kosciusko National Park and some 2,000 in the abutting Cobberas area. That is a combined National Park population of some 3,400 horses.

The area of the Murray/Snowy headwaters brumby range outside of National Parks is almost as large as the area of the brumby range in the National Parks. Can we assume that, at that time, it had a similar population, and that the combined brumby population some 7,000 horses? Or was it less?

Movement of Feral Horses
Implications for Feral Horse Management
Experienced locals tell me that generally a horse mob consisting of a stallion and his mares will have a home range of around 20 km. That within this range is a home territory which the stallion will defend. The home territory being that area the mob is currently grazing. The colts will locate within this home range often on the edges of the home territory.

Generally feral horses won't move beyond this home range. The exceptions being:
- Movement for food or water, from locations that have none, to locations that do.
- Movement out of higher altitudes in winter.
- Movement to escape bushfires.
- Movement into new abutting home ranges that have not previously been occupied, or into abutting home ranges that have become vacant.

Also there is not a homogeneous population. For instance feral horses at Suggan Buggan (in the east) are a different colour from those at Native Dog Flat (in the west).

The implications are that, within suitable horse habitat in the Murray/Snowy headwaters:

- There are a contiguous series of abutting home ranges.
- There is limited short term movement/migration of horses from one area to another unless it is for food or water, when these are scarce, or in the event of bushfires.
- Over the longer term horses will move in to occupy an area from which horses have been removed.

Thus it follows that:

- It may be possible to have a short term reduction of brumbies by targeting specific areas for removal; but over time horses from surrounding home ranges will move in and colonise these areas.
- That over the longer term targeting specific areas for horse removal without addressing global management and reduction of the combined brumby population across the whole Murray/Snowy headwaters, wether it be in NSW or Victoria or in National Park, Crown or private land, is as likely to be as successful as trying to drain the sea.

The other implication that is relevant to the management of both horses and pigs in Cobberas area is that when the elevated snow meadows without permanent water dry out, the horses and pigs move out of them. [3]

On the other hand, when the valley snow meadows with permanent water dry out, and become hard underfoot, horses and pigs move into them.

Therefore the short term priority should be significantly reducing the number of horses that are likely to enter the valley snow meadows when they dry out. An to explore other measures to exclude horses from the most important of these areas.

The medium term priority might be to reduce horse numbers in the Cobberas (and Kosicuszko NP) particularly around valley snow meadows at the west end to more manageable and acceptable levels

The longer term priority might be to reduce horse numbers throughout the Murray/Snowy headwaters to allow more sustainable longterm management of there population.

b The most reliable population data predates the January 2003 fires, the removal of cattle grazing from the Cobberas post the January 2003 fires, a

There is some disparity in various estimates of horse populations in the Cobberas post the January 2003 fires.

On the one hand we have estimates that the number of horses in both National Parks had decreased by 50% based on trial surveys of parts of Kosciusko that were then applied to the Cobberas to reduce its estimated population from 2,000 to 1,100 post fire. I have been advised that post fire aerial observations indicated a marked decline in Brumby numbers.

On the other hand my, and other, observations are that many of the areas regularly occupied by brumbies were not badly burnt and that brumby numbers have steadily built up since the fires.

[3] My random survey in late February 2007 indicated that horses and pigs had moved out of the elevated snow meadow complex below Mt Wombargo (at the eastern end of the National Park). These snow meadows were dry and hard under foot and generally without any, or an adequate source, of water. Locals tell me there are well defined brumby trails from these areas down to the Buchan and Suggan Buggan Rivers.

Locals who visited the area when the fires were finishing reported that whilst dead brumbies were seen along Native Cat Track there were a considerable number of brumbies gathered at Native Dog Flat. Other visitors reported that for a 6 month period immediately after the fires a large number of native and feral animals took refuge in unburnt areas around Blue Mountain (ie; downstream from Native Dog Flat).

Certainly there was a loss of animals and birds in the fire, and movement of birds and animals out of burnt areas to find suitable food.

By December 2003 whilst there was little recovery of ground cover in badly burnt areas, in other areas a considerable amount of highly nutritious fresh green growth had emerged.

Another post fire phenomena is the destruction, and only slow regeneration of the forest overstorey cover exposed the ground storey to far more light than is usual. This has caused the prolific growth of grasses on the ground to extents well beyond what is normal. Hence more quality food for brumbies, to support more brumbies.

One theory put to me is that this post fire abundance of nutritious food caused a horse population surge.

Dawson's 1999-2002 study of feral horses populations at 3 sites showed the population at Cowambat to be in the worst condition and showing no population increase. Dawson concludes that this population is food limited.

All things being equal the removal of summer cattle grazing would have made more food available for horses, thus improving the condition of these horses and allowing their population to increase.

c The Dawson population data and projections don't take into account brumby removal associated with cattle grazing.

There are indications in the documents referred to above that owners of cattle grazing in the Cobberas took steps to control/reduce the number of brumbies present and competing for pasture. That this also continues to occur on private grazing properties.

My enquiries have confirmed that, and also that in the years immediately preceding the 2003 bushfire, some 600 brumbies per year were removed in this fashion.

Suitable/Acceptable Management Control Measures

The Horse Management Plan identifies three forms of horse capture as the preferred means of feral horse population control, namely:

a Trapping through contract arrangement. [Trap Yards]
b Roping through contract arrangement [Brumby Running].
c Mustering through contract arrangement. [Mustering]

It notes that the effectiveness of any of these methods may reduce over time as their numbers decline and they learn to avoid capture.

The Horse Management Plan gives good reason for preferring these methods and it would seem sensible to proceed on the basis that these are the preferred methods, until such time that the shown otherwise, or better methods are proven. However the contract arrangements should provide both directives and incentives to target the removal of young fillies. – See Population Ecology discussion below.

In Victoria the Alpine Brumby Management Association (ABMA) is contracted to remove brumbies by roping, or as it is more commonly called brumby running. I understand the current contract is to remove a minimum100 horses per annum. Between 1998-2002 brumby runners removed some 200 horses per year. Since then the takeout has been half that, at around 100 per year.

Generally brumby running seems to be an effective and acceptable method of controlling brumby numbers. However it is not without its critics, particularly in NSW which choose not to use this method. In Victoria the formation of the ABMA dealt with some of that criticism by creating an umbrella organization to formalise (and legitimise) a formerly ad hoc, (and in some cases an illegal) activity. The ABMA appears to me to be a responsible organization prepared to work with other stakeholders.

On the other hand the ABMA openly (and honestly) states that its objective is to control brumby numbers and their present levels rather than reduce them.

I don't think we need to, or should, focus on issues such as this. That for the time being Victoria should adopt some or all of brumby capture methods referred to above. And in doing so establish appropriate targets and guidelines, and put in place a proper auditing of brumby removal numbers and compliance with those guidelines.

If Parks Victoria has confidence in the removal method, and the ABMA's ability to carry out all or part of that task, then so be it. In the longer term contracts will be awarded on performance, and it maybe that more than one contractor is engaged to perform similar or different horse capture methods to achieve appropriate control of brumby numbers.

Shooting
In New South Wales and Queensland the wholesale aerial shooting of the brumbies has elicited a hostile emotional reaction and a political backlash, which has led to a prohibition on, or abandonment of aerial shooting.

From the ground or horseback shooting by experienced bushmen is arguably one of the more efficient and humane methods of feral horse culling. No one is putting forward this as an option, and I don't think there is any point in my discussing or recommending this approach.

Population Ecology
Population ecology is a fascinating subject that I don't know a lot about. Good research and knowledge about the population and migratory dynamics of the feral populations will greatly assist longer term success of any management plan for the control of brumbies and other feral animals.

To use a simplistic example. Population ecology would shows that if we target the removal of male brumbies we would have a minimal impact on the longer term population simply because another male would step in to fertilise the available females.

On the other hand if we were to target the removal of young females before (or as) they becoming fertile we would have the longer term impact of removing her and the 6 or so foals she may bear during her reproductive lifetime.

I understand that brumby runners generally target the removal of young fillies because older horses and males are more difficult to break in and use as domestic horses. It would be a simple matter to write in to be horse capture contracts that all (or a high percentage of) horses to be captured were to be young fillies.

Dawson looks at this and concludes that of 683 horses recorded as removed from the Cobberas by brumby runners between 1998-2002 some 55% -65% were female of the total number of females 40% were described as mares and 20% as fillies. A better breakdown of female ages was not available, although it is assumed most horses caught were younger horses.

Dawson concludes that brumby running is likely to have a limiting effect on the population.

Her predictive modelling of the Cobberas population shows that with the then estimated population of 2,000 horses, the population effect of brumby running over time would be as follows:

- Nil removed per annum - an increase to 3,750;
- 100 removed per annum - an increase to 3,400;
- 150 removed per annum - an increase to 3,000;
- 200 removed per annum – a population steady at 2,000;
- 250 removed per annum – total removal after 22 years;
- 300 removed per annum – total removal after 14 years;
- 350 removed per annum – total removal after 10 years.

Dawson notes there is evidence to suggest the wild horse population in Kosciuszko increased 3-fold over 10 years.

She states that (in 2002) wild horses do not occupy the full extent of their potential range. However locals are now telling me that one significant change in brumby presence around the Cobberas is that they have now moved into “every nook and cranny” of their potential range. My 2007 and 2008 travels around the Cobceras area confirm this.

Critical Population Data and Advice

In my opinion there needs to be:

- Ongoing monitoring of the combined Murray/Snowy headwaters population, including population movements; and
- Ongoing involvement of a population ecologist in the general management of the Murray/Snowy headwaters brumby population on the basis that the population ecologist is employed to research and overview the total feral horse population in the Murray/Snowy headwaters, and to provide advice to all relevant stakeholders.

More recent surveys

Appropriate population level

I am not aware of the results of more recent surveys of horse numbers or range.

At the end of the day the appropriate criteria for establishing the maximum acceptable horse numbers in National Parks must surely be based on the damage they do to the environment and their long term impact on the sustainability of these parks.

That is, to ask whether the short and longer term damage caused to the environmental values of the Cobberas, is acceptable? And in this context regard has to be had to the future sustainability of those environmental values in the context of global warming.

I am of the opinion that prior to the removal of cattle, the presence of cattle and the cattle man's desire to prevent the high country's valuable summer being eating out by feral horses was a factor that led to a control on their numbers and largely prevented them from breeding up to a point where the environment could not sustain them.

Since the removal of cattle the only culling of horses in Cobberas section of the National Park has been brumby running carried out my the Alpine Brumby Management Association (BMA) who have generally removed around 100 horses per year.

According to the Dawson population studies (taken at a time when the population was probably lower) this rate of removal would still result in the increase in the horse population. The removal of twice that number, ie; 200, would only maintain the then population To begin to significantly impact the horse population as it then was it was. It was estimated that more than 300 horses per year needed to be removed.

4 PIGS

Pigs in the Cobberas
My random survey of February 2007 showed pigs present at all of the snow meadows visited. That is:

In the east
- the snow meadow complex below Mt Wombargo,

In the west:
- a site between Native Dog Flat and the Cowombat Track,
- 3 sites along the first section of the Cowombat Track;

and in around the playgrounds:
- one small site in the south east corner of the playgrounds; and
- 4 other sites nearby.

Of particular concern was the demolition by a pig (or Pigs) of a sphagnum bog (1 km east of the playgrounds) and the horse trampling that followed. At another smaller snow meadow (at altitude 1,450 m above the centre of the playgrounds) extensive damage to a sphagnum bog appeared to be caused by a combination of pigs and horses.

Much, but not all, of the pig damage was not extensive, indicating the presence of perhaps one pig that feeds for a short time at the location and moves on.

I am told the pigs feed on, amongst other things, the plentiful and nutritious tubers of various daisy and other plants.

I think that what we are mostly experiencing is the phenomena of the lazy pig in shit. That is a few pigs that because of the plentiful food supply are able to roam about and take their food at random. Although in the case of the damage to the sphagnum bogs referred to above that damage was continuous over a 3 month period.

In the fragile environment of the alpine meadows even a single pig can do a great deal of damage; particularly to the sphagnum bogs that may take 100's of years to form. And it worries me that what they are feeding on in sphagnum bogs are orchid tubers.

Pigs are extremely hardy, can live in the snow, and breed up quickly.

Parks management is well aware of the destructive presence of pigs. Recently a dedicated pig person was appointed to tackle the problem.

Some difficulty in reducing pigs numbers is being experienced, both in NSW and the Cobberras because the methods of pig control that work elsewhere don't necessarily work in the higher and more difficult/remote terrain where there is a good food supply. In these conditions pig control is a painstaking and sometimes frustrating process, requiring patience and persistence.

The dedicated pig person has liaised with the local community including farmers, is well respected. There is confidence that the best way to tackle the problem is ongoing funding of his position and long term commitment of resources to allow him to tackle the problem.

Pigs in areas east of the Cobberas
I am told there are a large population of pigs all along the Snowy River Valley. That the migration of pigs has been down from NSW into the Victorian section of the river valley and thence into (a) the Cobberas and (b) the pastures extending south from Black Mountain along the Barry Way towards Buchan.

That first boars move into an area, and are followed some distance behind by sows. That to date the boars have been found as far south as Pattersons Cutting (ie; more than half way to Buchan) and sows around Seldom Seen.

Farmers along the Barry Way are extremely concerned about the southward spread of pigs onto their properties from the National Park and from the Snowy valley. That concern is likely to increase as the pigs wend their way further south.

Strictly speaking, in the eastern highlands, the Parks Victoria dedicated pig person at Omeo only deals with pigs in National Parks. There is an understanding that there is some responsibility to work with adjoining property owners to deal with pig movements across National parks boundaries.

In NSW, at the lower altitude of Snowy valley east of Kosciuszko NP two experienced bushmen work on a program to control/eradicate pigs in there areas and by all reports do a good job.

At lower altitudes east of the Cobberas, and outside National Parks, there is, as far as I know, no similar, program or persons to work on the pig problem.

What Works

There is no better example of what works than the English Broom eradication program being run out of Omeo. For many years programs to control the English Broom struggled and we saw the English Broom in the areas around Omeo increase to levels that most thought to be beyond control. However a well considered and resourced management arrangement was put in place that included the following:

- A dedicated English Broom control officer based in Omeo;
- Adequate resources to employ skilled and dedicated contractors;
- Very good liaison with the local community and other stakeholders; and
- Long-term funding and resource commitment to ensure continuation of program until the job was done.

Since then the reduction in English Broom as being dramatic, even in very remote and inaccessible areas. The locals think it is great. They can ring up their Omeo office and report sightings of English Broom. Shortly after those reports the offending plants have been sprained and there is generally later follow-up to remove any surviving plants. It is a very effective and popular program.

There is little point in embarking on these exercises unless there is long-term commitment to getting the job done. With English Broom there is no point in knocking out even 90% of the English Broom unless you are going to go back next year and the years after to ensure the final 10% is removed, and doesn't come back. Without follow up the 10% remaining quickly builds back up to the level it was before the eradication exercise commenced.

Robbing Peter to pay Paul

There is some concern that without additional funding monies will be taken from the English Broom follow-up program and transferred to horse reduction measures. There has already been a reduction in general ranger resources to allow a pig person to be engaged. If this is perpetuated nothing will get fixed properly.

The feral horse and pig problem at its present level, requires adequate new funding, not funding taken from other essential programs and management areas.

Suggested Actions
I am of the opinion that prior to the removal of cattle, the presence of cattle and the cattle man's desire to prevent the high country's valuable summer being eating out by feral horses was a factor that led to a control on their numbers and largely prevented them from breeding up to a point where the environment could not sustain them.

Since the removal of cattle the only culling of horses in Cobberas section of the National Park has been brumby running carried out my the Alpine Brumby Manageent Association (BMA) who have generally removed around 100 horses per year. According to the best available population studies (taken at a time when the population was probably lower) this rate of removal would still result in the increase in the horse population. To begin to significantly impact the horse population as it then was it was. It was estimated that more than 300 horses per year needed to be removed.

My Feral Horse Notes 2008 also on my CD and executive summary at the beginning of this paper includes suggestions for dealing with the feral animal problems discussed. The key factor being adequate new funding to engage contractors to increase the removal of feral horses from the Cobberas to a level that will see a significant reduction in feral horse numbers.

The measures referred to in those notes are increased removal by:
a Trapping through contract arrangement. [Trap Yards]
b Roping through contract arrangement [Brumby Running].
c Mustering through contract arrangement. [Mustering]

I suggest any such contract arrangements should provide both directives and incentives to target the removal of young fillies. – See discussion of Population Ecology.

At the very least additional contractors should be engaged to complement the work of the Alpine Brumby Management Association, and to dramatically increase the number of feral horses removed from the Cobberas area.

And:
- A long term horse management program targeting a real reduction in the feral horse population, managed by a dedicated Parks Officer at Omeo.

- A well-prepared Community/Media Liaison Package and training to ensure that that staff and contractors carrying out these tasks are able to effectively articulate to, and educate the public and media about, relevant issues. It should cover the reasons feral horse management is being carried out, why particular methods and procedures are being used, the humane horse handling guidelines applied, and information to balance some of the romantic notions held about brumbies.

- Co-ordinated action across all relevant jurisdictions. In the Australian Alps we have a large population of feral horses inside and outside of National Parks in New South Wales and other parts of Victoria. To successfully implement an overall horse management plan for the Alps we need coordination and cooperation with other jurisdictions to ensure both that (a) simultaneous and co-ordinated horse management programs are run by all, and (b) that individual program objectives are not thwarted by the movement of replacement horses into areas from where horses have been removed.

- Research. But not research as an excuse for delaying taking immediate action.

- An adequate long term funding commitment

There are sound arguments (including the impact of climate change) favouring Federal Government involvement and the joint management of the Australian Alps as one truly

national (and iconic) National Park and tourist destination. I think its is time such a proposal were seriously considered.

But in the end, it's all about funding.

Appendix A

The Myth of the Silver Brumby
In New South Wales and Queensland the wholesale aerial shooting of the brumbies has elicited a hostile emotional reaction and a political backlash, which has led to a prohibition on, or abandonment of aerial shooting.

This reaction was partly engendered by many people's love and admiration of the horse, which has had a long and endearing relationship with men since the early stages of human civilization, and man's domestication of wild animals.

It is also engendered by what I call the Myth of the Silver Brumby. The myth that gives rise to images of noble and beautiful wild horses running freely in our mountains, plains and forests.

However, as is often the case, reality is far removed from the myth.

Feral horses come from a domesticated environment where their numbers and quality of their breeding has been strictly controlled for thousands of years. The original brumbies were released into, the harsh Australian bush where, without any natural predators, other than nature itself, their numbers built up as quickly as their uncontrolled breeding (and interbreeding) reduced the general quality of the feral population.

There are still many fine horses to be seen, but with uncontrolled breeding there are many rather grotesque looking horses. For example, horses with large heads on smaller bodies with short legs. I know next to nothing about the health of horses; the diseases, parasites or the health conditions they suffer from. However from time to time in the high country I do see horses that look to be terribly poor condition.

The Australian Alps like many parts of Australia have periods when year after year there are abundant seasons. These can be followed by year after year of drought and occasional bushfires. [4]

Northern Territory studies have shown that in good years following a depopulation event, feral horses can breed up very quickly. I think that today in the high country we are experiencing the phenomena of a rapid and uncontrolled build-up of horse numbers in good times following drought and bushfires.

Unlike kangaroos and other native animals the feral domesticated horse as no natural breeding mechanisms to cope with cyclic climate changes. And unlike non feral horses there is no human controlling mechanism to limit its cycle of breeding up and catastrophic decline as drought and bushfires take a toll on their populations.

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[4] These cycles have repeated themselves with years of plenty in the early 1930's followed by drought and devastating bushfires. Extreme drought in 1972 following good years. There were years of plenty in the late 1990's followed by drought the extensive 2003 bushfires, then good years, extreme drought and more recently a few better seasons.

Also in times of plenty we seem to see the strict control and better breeding practices engendered by a lead stallion's control over his harem band alter to a situation where we see small groups of three or four horses moving around on the edges of places where larger groupings gather. That is a stallion, mare, a juvenile, and sometimes a yearling in the group.

Unchecked, horse numbers will continue to build-up whilst there is good feed and the availability the minerals which they require to maintain a healthy condition. At some stage, which, in the Cobberas, I think we reached some time during 2006, the resources needed to sustain a rapidly growing horse population cannot sustain that population.

That this position has now been reached is evidenced by the movement of horses into the streams, stream edges, swamps, soaks, springs, sphagnum bogs and other wetter areas they generally avoid, or simply pass through. Reports of horses literally eating parts of roads that have mineral salt deposits, and eating pinewood signage posts (that in some circumstances, by capillary action draw salts up out of the ground) are indications that the easily accessible natural supply of mineral salts is not meeting the demand from a higher population.

In times such as these the habitat, in particular delectate wet habitats, take a real belting. If conditions then turn to drought the horse population first loses condition and then suffers an, often brutal, decline.

A local cattleman told me that during the 1972 drought feral horses daily made a journey from pastures in the high country down to remaining water in permeant rivers in the valleys, and then back up to feed. That in the course of these desperate travels hundreds of horses died a slow and painful death.