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## PEAT BOG AND FEN IMPACTS

### FERAL HORSE DAMAGE TO SOFT TERRAIN: BOGS AND FENS IN THE SNOWY MOUNTAINS

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The Snowy Mountains, including the higher areas of Kosciuszko National Park, are cooler and wetter than 98% of Australia, and in consequence support some of the outstanding examples of sodden vegetation that builds up deep organic soils. These peat soils and their dense vegetation cover are important to the ability of the mountains to intercept rainfall. They also act as an armour to reduce the erosion of mineral soils, efficiently trapping sands and silts that wash into the valley floors. At higher altitudes, peatlands host snow for longer. The result is very clean water, released steadily to streams, and a stable, moist environment that is fire resistant. This has allowed a specialised biota to develop, which include animals like the Corroboree Frog and Alpine Crayfish. The Alpine Sphagnum Bogs and Associated Fens Endangered Ecological Community is a Threatened Community (Australian Government 2009) and included in two Ramsar sites: Ginini Wetland Complex, ACT, and Blue Lake, Mt Kosciuszko, NSW.

Recent mapping has found 8,000 ha of peatland above 800 m in the Snowy Mountains and ACT Ranges, occurring as 9,200 individual patches spread like islands across the mountains (Hope et al. 2012). Above 1,700 m, there are also large areas of humus soils forming a blanket bog on slopes. The modern peatlands represent a fraction of the bogs and fens that were probably present before the arrival of stock animals in the 1840s, as wide areas of swamp were trampled and burnt, and in a few cases drained, leading to the oxidation of organic soils and soil erosion. Tussock grassland spread onto former peat areas. Since stock was removed in the 1950s, the wetland vegetation has partly recovered; however, dated sections (Hope and Nanson 2015) through the peat soils show that it will take millennia to replace lost peat.

Horses are now reversing this recovery and causing further damage. McDougall and Walsh (2007) note:

The chief threatening process for peat communities in the Australian Alps is physical damage by trampling leading to loss of cover and alteration of local hydrology which leads to channelling of waterflow through the bog. This alteration of drainage patterns within and immediately outside the bog reduces its water-holding capacity, which in turn accelerates the degradation process.

Examples of stream widening, incision of peatlands, pugged peat and drying peat at risk from fire have been described in all areas of horse occurrence in Kosciuszko National Park. Soft moss hummocks that are key to raised water tables are readily destroyed by trampling, thus losing the mosaic of small pools that are essential to frog breeding success. During drier periods, the soft sedges of fens are grazed and horse trackways become drainage lines that concentrate flows.

Actively growing peatlands fix carbon and are a net carbon store of critical international importance (World Conservation Congress 2018). In the Snowy Mountains, intact bogs have up to 2 m of peat, while fens have up to 6 m. These bogs and fens contain an estimated 3.55 Tg (Teragram or  $10^{12}$  gram) of carbon that is at risk of being washed into streams or being emitted as methane and carbon dioxide as the peat dries and degrades (Hope and Nanson 2015). Given that the Australian Alps national parks must be managed to maintain natural values, the way to support the recovery of the peatlands is to reinforce natural processes of vegetation succession and enhance the retention of water, carbon and sediment stores. Control of access, control of large feral animals and weeds, and fire suppression are already considered in plans of management for the Kosciuszko National Park and in consultation with relevant land managers in NSW, Victoria and the ACT.

Horse control in particular is becoming critical to the preservation of mires in many areas. Deer have also started to increase and reach higher altitudes, causing similar damage to recovering vegetation. However, their effect to date has been minor compared with that of horses. Trials on rehabilitating peatlands that have been damaged include small organic barriers (straw, coir or wood) in streams (see photo), fertiliser and replanting Sphagnum clumps (Whinam et al. 2010). These have met with reasonable success and could be rolled out more widely. However, there is no point in doing so unless heavy-hoofed animals are reduced to very low numbers or excluded from stream lines and soft soils. An immediate priority is to exclude animals that are reaching the fragile and slow-growing alpine area above 1,800 m in the summer months.

## References

- Australian Government (2009) *Alpine Sphagnum Bogs and Associated Fens*. EPBC Act 1999, Policy Statement 3.16, Department of the Environment, Water, Heritage and the Arts, Canberra.
- Grover, S. P. P. and Baldock, J. A. (2012) Carbon Chemistry and Mineralisation of Peat Soils from the Australian Alps. *European Journal of Soil Science* 63: 129–140.
- Hope, G. and Nanson, R. (2015) Peatland Carbon Stores and Fluxes in the Snowy Mountains, New South Wales, Australia. *Mires and Peat* 15(11): 1–23. <http://www.mires-and-peat.net/pages/volumes/map15/map1511.php> (accessed 11 October 2018).
- Hope, G. S., Nanson, R. and Jones, P. (2012) *Peat-forming Bogs and Fens of the Snowy Mountains of New South Wales*. Technical Report. Office of Environment and Heritage, Sydney.
- McDougall, K. L. and Walsh, N. G. (2007) Treeless Vegetation of the Australian Alps. *Cunninghamia* 10(1): 1–57.
- Whinam, J., Hope, G. S., Good, R. and Wright, G. (2010) Five Years of Post-fire Monitoring of the Recovery of Sphagnum Shrub Bogs in the ACT and NSW, Australia. In S. Haberle, J. Stevenson and M. Prebble (eds), *Altered Ecologies: Fire, Climate and Human Influence on Terrestrial Landscapes* (Terra Australis 32), pp. 363–379. ANU E Press, Canberra, ACT. <http://doi.org/10.22459/TA32.11.2010>.
- World Conservation Congress (2018) *Securing the Future for Global Peatlands*. World Conservation Congress -2016-Resolution-043-EN. [https://portals.iucn.org/library/node/46460?utm\\_source=IUCN+UK+Peatland+Programme+Master+List&utm\\_campaign=276f1ca855-MAIL\\_CAMPAIGN\\_2018\\_08\\_23\\_10\\_40&utm\\_medium=email&utm\\_term=0\\_7872ad6518-276f1ca855-186362097](https://portals.iucn.org/library/node/46460?utm_source=IUCN+UK+Peatland+Programme+Master+List&utm_campaign=276f1ca855-MAIL_CAMPAIGN_2018_08_23_10_40&utm_medium=email&utm_term=0_7872ad6518-276f1ca855-186362097) (accessed 11 October 2018).

FERAL HORSE IMPACTS



A straw bale and coir barrier across a streamline on Mt Scabby, ACT, placed to impede incision after the 2003 fires.

Source: Geoff Hope.



Feral horses near Tantangara have channelised a large sedge fen exposing it to headward erosion.

Source: Geoff Hope.