

Alpine (Livestock) Grazing

Position Statement by
The Ecological Society of Australia

Co-ordinator: Dr Arn Tolsma (arn.tolsma@dse.vic.gov.au)
Phone: 03 9450 8645

Summary

Since European settlement, grazing by livestock has caused an unacceptable level of damage to Australia's sub-alpine to alpine zone, with implications for water quality, soil erosion, weeds, biodiversity and nature conservation. The results of long-term studies since the 1940s have shown unequivocally that alpine grazing is an inappropriate land management practice, particularly in the Alps National Parks and Tasmania's Central Plateau. The Ecological Society of Australia urges all levels of government to ensure that the ban on livestock grazing in alpine parks is maintained.

Introduction

Geographically, the term 'alpine' refers to those areas above the regional upper limit for trees, which on the Australian mainland occurs at approximately 1830 m¹. However, inverted treelines are common^{1,2}, where shallow, high-altitude valleys are subjected to severe frosts from cold air drainage. Thus, whilst being geographically sub-alpine, vegetation communities in these valleys are more closely associated with alpine vegetation communities³. This position statement will therefore extend the term 'alpine' to all high-altitude regions (including peaks, high plains, plateaux and snowgum woodlands) that are subject to seasonal snow cover.

The extent of Australia's alpine and sub-alpine zone is relatively small by world standards, accounting for only 0.15% of Australia's total land area. More than half of this is in Tasmania. The regions defined as true alpine total less than 1000 km², or around 0.01%, with the mainland contributing only 300 km²^{1,4}. These areas are expected to shrink further under the effects of climate change, with implications for those plants and animals with restricted distributions.

Domestic livestock grazing commenced in the Australian Alps in the 1820s, with grazing pressure being particularly high in drought years in the early 1900s when large numbers of horses, sheep and cattle grazed the high plains⁵. Livestock (with the exception of feral horses) no longer graze high-altitude public land, but still graze on private land on both the mainland and Tasmania's Central Plateau. Cattle grazing was finally banned in Victoria's Alpine National Park in 2005, but there is strong pressure to overturn that ban.

Alpine plants may recover slowly (both in a physical and physiological sense) after defoliation⁶, because of a combination of short growing seasons, harsh conditions and natural slow growth rates⁷. The alpine ecosystems have evolved over thousands of years without the grazing pressure and physical impact of heavy, hard-hooved animals^{3,5,8,9,10}, and grazing by domestic livestock thus represents a type and intensity of impact to which plant species and communities are not adapted. Long-term grazing studies have confirmed that grazing has had significant impacts on a wide range of ecosystems, and hence natural values, within alpine areas.

Erosion

Domestic stock grazing in alpine and sub-alpine zones reduces herbaceous ground cover, as stock prefer the more palatable inter-tussock herbs over the coarse snowgrasses. The physical damage done to the vegetation and the erodible organic alpine humus soils leads to increases in the amount of bare ground^{3, 11, 12, 13}. As little as 5% bare ground can cause substantial increases in surface run-off and soil loss¹⁴, particularly where frost heave and wind ablation are active. The risk of land degradation increases as bare ground increases and vegetation cover declines^{15, 16}, and for effective soil conservation the cover of vegetation should be maximal^{13, 14, 17}. This is not possible in grazed areas, particularly as rangeland grazing is highly selective both in terms of the sites and the plant species preferentially grazed^{18, 19}.

Weeds

Studies have shown that livestock grazing led to the introduction of numerous weed species to much of the high altitude country, particularly in areas of higher soil fertility, around stock camps and along stock access routes. The highest number of weed species and population numbers have been recorded in grazed areas¹¹. Weeds can regenerate vigorously after fire, even when few weeds are observed in the unburnt sward²⁰, suggesting that a large weed seed bank exists in the soil. The maintenance of a thick sward of native vegetation can generally restrict the establishment of introduced species²¹, but this can only occur in the absence of major disturbances such as grazing.

Nature conservation and biodiversity

Alpine landscapes are limited in area and distribution, both at a state and national level, and contain plant communities and flora and fauna species that are found nowhere else in Australia and the world. Accordingly, a range of threatened plant communities and rare plant and animal species are listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act (1999)*, and various state acts. In Tasmania, much of the Central Plateau is now contained within the Tasmanian Wilderness World Heritage Area.

Alpine taxa or plant communities have been affected by the selective nature of grazing, and by physical damage to habitat and the underlying substrata^{3, 11, 13, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36}. *Sphagnum* bogs are particularly susceptible to physical damage from livestock grazing^{3, 8, 26, 35, 37, 38, 39, 40, 41, 42}, especially after fire. These alpine bogs, home to many threatened flora and fauna species, are now reduced in both extent and condition. Snowpatch vegetation is also very susceptible to grazing⁴³, as it occurs on steep slopes and under a continuous flow of cold, snowmelt water. Little remnant snowpatch vegetation now exists.

Flora and fauna taxa that are restricted to the alpine zone are now under further pressure from the impacts of global warming^{44, 45, 46, 47, 48, 49}. This is expected to result in a contraction of their ecological range, with no alternative sites for them to colonise as the snowline and temperatures ascend the altitudinal gradient. It is therefore incumbent on land managers to ensure that the diversity and integrity of the alpine ecosystem are maintained, so that all species have the greatest chance of surviving in the long-term. Alpine bogs and peatlands also overlay millions of cubic metres of highly organic peat⁵⁰, and the oxidation and decay of peat deposits may result in transformation of these peatlands from carbon sinks to carbon sources⁵¹.

Aquatic ecosystems and catchment values

The alpine region is vital for the provision of high quality water for domestic, hydro-electricity, recreational and agricultural uses, and for providing environmental stream flows, and in Victoria, for example, many regions are designated as Special Areas under the *Catchment and Land Protection Act 1994*. However, livestock grazing in high altitude catchments can lead to degraded water quality, increased rates of run-off and reductions in stream biodiversity⁵².

Sphagnum bogs and fens with their capacity to filter and regulate water play an important functional role in catchment hydrology. However, livestock grazing has left less than 50% of the original *Sphagnum* peatbed area in a functional state^{15, 53}, and those that remain in areas grazed up to recent times are generally in poor condition⁵⁴. Many bogs on the mainland were severely burnt in the 2003 alpine fires, particularly those surrounded by heathland or woodland, and remain at an elevated risk of further damage. Riparian strips, wetlands and associated buffer zones that maintain the integrity of their vegetation complex have the potential to filter suspended solids, nutrients and pollutants^{55, 56, 57, 58, 59}, and as such no grazing should ever occur in them. Moreover, the widespread distribution of wetlands and streams across the alpine areas ensures that they cannot be isolated from other high-altitude vegetation complexes, and livestock grazing should thus be excluded from all of the alpine vegetation communities.

Role in fuel reduction

There is no scientific evidence to support the claim that grazing in alpine and sub-alpine zones plays any role in mitigating the effects of wildfire. During the 2003 fires, grazed areas were just as likely to be burnt as ungrazed areas, and grazing did not reduce fire intensity^{60, 61}. The pattern of burning was related to vegetation type. The effects of grazing are more likely to be counter-productive, in that the resulting bare ground provides microsites that are conducive to the establishment of flammable, non-palatable shrub species^{13, 31, 62}.

Historical burning of shrubs in an effort to provide more herbaceous stock feed has also generally resulted in an increase, not decrease in shrub cover, exacerbating the potential fire hazard⁶³.

Conclusion

Grazing by livestock in the sub-alpine and alpine zones represents a significant threat to water, soil, nature conservation and biodiversity values. The Ecological Society of Australia urges all levels of government to support and maintain the ban on livestock grazing in these areas.

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