

# ***Joined-up thinking for recreation management?***

## ***The issue of water pollution by human sanitation on the Mar Lodge Estate, Cairngorms***

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### **Introduction**

The Cairngorms National Nature Reserve (NNR) has been described as the most natural place in the British Isles (Curry-Lindahl, 1990). At the heart of the NNR is Mar Lodge Estate, which incorporates over 7000 ha of the reserve. It is widely recognised as the most important place for nature conservation in the UK. Following centuries of mismanagement for personal sporting interests, the estate was transferred into the ownership of the National Trust for Scotland (NTS) in 1996.

The area is also recognised as a recreation 'honey pot' (Fielding and Haworth, 1999), with a long tradition of unfettered public access. Trends in recreation have changed markedly in recent times. The last two decades have been characterised by a dramatic growth in the popularity of mountaineering, mountain biking, bothying and wildcamping. <sup>1</sup> Whilst the mountaineering fraternity in the Highlands are often the first to campaign against the perceived unsustainability of other land uses, there is a widely held resistance to acknowledging that their own pursuits negatively affect the environment. This article will examine the impact of human sanitation on water quality in montane environments with particular reference to recent developments likely to increase such pollution in part of the Cairngorms NNR now owned by the NTS.

### **Human Sanitation and Water Pollution in Backcountry <sup>2</sup> Areas**

Whilst great attention has been paid to the issues of footpath erosion (e.g. Watson, 1984) and disturbance of wildlife (e.g. Liddle, 1997) in the Scottish Highlands, the issue of backcountry human sanitation and consequent water pollution has been largely ignored.

One impact of untreated sewage is to raise the levels of phosphorous and nitrogen in watercourses. The chemistry of naturally eutrophic watercourses such as the Norfolk Broads are little effected by the discharge of human sanitation (Moss, 1977). However, in the Cairngorms the underlying granite and low levels of primary productivity have created oligotrophic watercourses, sensitive to even low levels of eutrophication.

Human waste also introduces a variety of pathogens into aquatic ecosystems. Research from the United States has shown that faecal coliform bacteria and faecal streptococci in a reservoir were significantly higher in the vicinity of a recreational centre (Barbaro et al., 1969).

Current backcountry guidelines such as the Bothy Code (Mountain Bothies Commission) and the Wildcamping Code of Conduct (The Mountaineering Council of Scotland) recommend the shallow burial of human faeces. However experiments suggest that bacteria such as salmonella can survive burial at 20cm depth for 51

weeks in a montane environment (Temple, Camper and Lucas, 1982). Furthermore, Mason (1991) reported that human pathogens can be transported by rodents, whose urine can carry the organisms into the water. Buried faeces are therefore potential sources of water pollution in wilderness camping areas (Liddle, 1997).

### **The Particular Problems of Water Pollution on Mar Lodge Estate**

Mar Lodge Estate is traditionally a popular area for backcountry overnight stays. The area is well served by bothies and includes the most popular howff in the Highlands<sup>3</sup>. However it is the popularity of wildcamping in the area that is most noteworthy. Wildcamping is a popular activity in its own right but it is also used by hillwalkers to avoid the 'long walk in' and by backpackers journeying between Speyside and Deeside. It is not uncommon to find in excess of 60 tents in the most popular locations. No sanitary provision is made for the wildcampers.

Levels of water pollution are sensitive to recent weather conditions. The relatively continental climate of the Cairngorm mountains can result in lengthy dry periods in summer. The extensive high plateaus and precipitous slopes contribute to severe summer thunderstorms (Watson, 1982). Intense rainfall after a long dry period resulting in overland flow can produce levels of faecal coliforms and faecal streptococci ten times greater than background levels (Hendry and Toth, 1982). A similar effect is experienced during the Spring thaw.

In a spot check at Ryvoan bothy in the Cairngorms, Pringle (1996) found that levels of coliform bacteria in a stream by the bothy were ten times higher than they were just a few metres upstream. The concentration of bacteria only returned to background levels 60 metres downstream from the bothy. Significantly higher levels of non-coliform bacteria, phosphate, sodium and chlorine ions were also recorded in the vicinity of the bothy.

The National Trust for Scotland has implemented strict pollution prevention policies for their staff and

work parties. When working on the estate all human waste, liquid and solid, is collected and carried out of the mountains. This follows best practice from National Parks in North America and scientists working in Antarctica. However there is no such requirement of members of the public partaking in backcountry recreation on the estate.

It can be seen that there exists a significant problem of water quality resulting from recreationists in the area. Anecdotal evidence suggests that it is not unusual for recreationists to contract stomach bugs after overnight stays in the area. There are obvious implications for human settlements that draw their drinking water from the River Dee downstream of the NNR. This case of water quality is therefore a classic case of sustainability in which environmental pollution poses a threat for both wildlife and people. However, on Mar Lodge Estate, the potential to reduce pollution has been compromised by recent developments.

### **Recent Complications in the Management of Recreationists on Mar Lodge Estate**

The pollution challenge facing conservationists can be characterised by the principle of the 'Frontiersman and the New Yorker'<sup>4</sup> (Tietenburg, 1996). The greater the number of overnight stays by recreationists, the greater the pollution problem for people and wildlife. Freedom of access (save for a short period during the 'Highland season'<sup>5</sup>) is staunchly defended in the Highlands. The purchase of land by a conservation organisation is generally accompanied by an expectation of even freer access. Furthermore the draft Access Code (part of the Land Reform Bill due to go before the Scottish Parliament) endorses the right of recreationists to engage in wildcamping (Scottish Executive, 2001; section 3.22). The code advocates a right of 'responsible access'. In relation to human waste, the code requires that recreationists "*only urinate or defecate where there is no risk to human health and follow good practice in burying waste*". The above discussion suggests that these conditions may be difficult to achieve.



Photograph taken by David Blyden, UHI

### ***Sgor an Lochan Uaine and Braeriach, Cairngorms***

A consequence of 'Frontiersman and the New Yorker' is that individuals should not be actively encouraged to stay overnight in backcountry locations. However recent developments on the Mar Lodge Estate are likely to increase the number of 'Frontiersmen' in this particular 'wilderness'. In the 1997 revision of Munro's tables, Sgor an Lochan Uaine (pictured), situated in one of the remotest corners of Mar Lodge Estate and at the heart of the NNR, was elevated to Munro status. Before its recent fame, it stood as an infrequently visited top, well in excess of the 3000 feet threshold of Munros but not regarded as a mountain in its own right. To climb Sgor an Lochan Uaine requires a 14km trek to the start of the climb, after which walkers must ascend Cairn Toul, the fourth highest mountain in Britain, before continuing to Sgor an Loch Uaine itself<sup>6</sup>. The round trip in a single day is beyond the stamina of many Munro baggers and an overnight stay either at one of the popular wildcamping sites in the area or at the conveniently located Corroul bothy is a common choice.

The number of hillwalkers studiously ticking off the Munros is difficult to estimate. However it is notable that when a revised edition of the SMC Munros

guidebook suggested that the descent of Ben Lomond may be varied by taking in a subsidiary peak, a massive footpath scar developed in just three years, where before there had been no path at all. With regard to Sgor an Lochan Uaine, NTS rangers noted scores of baggers on the remote summit on the weekend after the designation was announced, despite inhospitable weather conditions.

The proportion of Munro baggers electing to wildcamp or bothy may also have been increased by the recent ban on cycling on the estate<sup>8</sup>. The estate has a well-developed network of robust bulldozed tracks ideal for mountain biking. Over the last two decades, cycling into the mountains has become a popular way of achieving the bases of the remoter Cairngorm summits, bringing many into the domain of a single day excursion. With cycling into (and out) of the Cairngorms no longer an option, many hillwalkers will choose to stay overnight in the mountains. The environmental impact of camping or bothying in the area is almost certain to be greater than that of cycling on the bulldozed tracks.

### **Conclusion**

The impact of the Munro designation and cycling

ban is likely to have been an increase in the number of 'backcountry bed-nights' in the area and a concomitant deterioration in the quality of watercourses in the NNR. The Cairngorm Partnership indicated in their management plan (Cairngorm Partnership, 1999) that one of the policies for the mountain core is to reduce visitor pressure. No attempt was made to consult either the Cairngorms Partnership or the NTS before Sgor an Lochan Uaine was promoted to Munro status.

There is clearly a need for further research into both the biochemistry of backcountry sanitation and possible engineering solutions to the problem (such as specified wildcamping sites with some form of sanitation)<sup>8</sup>. Recreationists must be made aware of their impact on the environment, not only in terms of their sanitation, but also the washing of utensils in watercourses and the use of cleaning agents, soap and toothpaste. Notwithstanding possible technocentric solutions to the problem, organisations with influence over recreationists must recognise their responsibilities and engage in "joined-up thinking", in order to achieve the universally accepted aim of sustainability in the mountains.

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### Footnotes

<sup>1</sup> *Wildcamping is defined as an overnight stay using a backpack tent in a location distant from a public road and not on a commercial campsite.*

<sup>2</sup> *The American term "backcountry" is used to describe any location distant from human settlement and infrastructure. The terms "wildland" and more so "wilderness" are contentious in the Scottish context*

<sup>3</sup> *The Shelter Stone is a natural shelter formed by a jumble of boulders.*

<sup>4</sup> *In North America a river in a wilderness area is traditionally regarded as being able to cleanse itself every 10 miles. Therefore one frontiersman can have no impact on water quality as long as he is more than 10 miles away from the next frontiersman. Frontiersmen therefore need not concern themselves unduly with water pollution, however in New York 17 million people live within 10 miles of each other. New Yorkers have therefore been forced to create an appropriate sanitation infrastructure to deal with the problem.*

<sup>5</sup> *This is the late summer and early autumn when the landed gentry would traditionally migrate to the Highlands for grouse shooting and deer stalking seasons.*

<sup>6</sup> *Other routes of ascent are possible, though they are not as popular and no less arduous.*

<sup>7</sup> *The Mar Lodge Estate was purchased with the aid of £4 million from the Easter Trust. As part of the purchase agreement, the Easter Trust required National Trust for Scotland to phase out the use of*

*mechanical vehicles on the estate. The Easter Trust regard cycles as mechanical vehicles. It is unclear whether the many de facto rights of way on the estate extend to access by bicycle (Rowan-Robinson, 1994). However prominent signage requiring that cycles not to be used on the estate is sufficient to dissuade most hillwalkers from using this form of transport.*

<sup>8</sup> *After the NTS purchase of Mar Lodge Estate, the MBA offered to install and maintain a biological toilet at Corroul bothy. The offer was declined by the NTS, apparently on ideological grounds.*

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