Journal of Outdoor Recreation and Tourism 19 (2017) 25–36

Contents lists available at ScienceDirect

Journal of Outdoor Recreation and Tourism

journal homepage: www.elsevier.com/locate/jort

# A longitudinal study of backcountry track and campsite conditions on the Overland Track, Tasmania, Australia

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ARTICLE INFO

*Keywords:*
Recreational impact
Monitoring
Walking tracks (trails)
Campsites
Condition scale

ABSTRACT

The 79 km Overland Track is Tasmania's premier overnight walking track (trail) and one of Australia's best-known and most popular backcountry hikes. Trampling impacts (poor track condition) were recognised in the 1970s and degraded campsites were a concern by the 1980s. Despite three decades of intermittent works, many sections of track remained in poor condition in the early 2000s, but targeted works since 2006 have addressed many problem areas. Hardening of campsites at selected overnight nodes commenced in 2000 and a reduction in overall camping impacts followed, presumed due to a greater concentration of camping use at the hardened sites despite unrestricted camping still being permitted. Longitudinal monitoring of both track (8 years) and campsite (16–25 years) conditions, using relatively simple techniques, have successfully described the scale and delineated the location of changes in condition and so provided a useful planning tool for management. In particular, it has contributed to documenting a contemporaneous improvement in track and campsite conditions partly associated with a booking system to regulate walker use of the Overland Track, introduced in 2005. Booking fees have contributed to management successes by providing adequate and consistent resourcing for the repair and maintenance of walking track surface infrastructure.

*Management implications:*

- Extensive hardening is an effective way to sustainably manage a moderate to high use walking track that has not been initially well-designed.
- Adequate and consistent resourcing for the repair and maintenance of walking track surface infrastructure is necessary to sustainably manage such tracks.
- The provision of inviting facilities, including camping platforms, at selected overnight nodes has resulted in a concentration of visitor camping use on a smaller number of campsites, hence reducing the overall impact of camping along the Overland Track.

## 1. Introduction

The 79 km Overland Track is Tasmania's premier overnight walking track (trail) and one of Australia's best-known and most popular backcountry hikes. It has a long history of use and consequent development of trampling-related track and campsite impacts. Various management tools have been deployed to address such issues since the 1980s and a relatively-simple monitoring system has documented some of the effects of such tools, particularly since 1999.

Hiking and camping are common recreational activities in many of the world's natural protected areas. The primary goals of management for such areas is limiting the areal extent of human impacts, as well as limiting the severity of impact to levels that are not ecologically, managerially, aesthetically or functionally significant (Marion, Leung, Eagleston & Burroughs, 2016). Managers hence often need to implement measures such as stabilising walking tracks or campsites, or educating or regulating visitors, to limit recreational impacts (Park, Manning, Marion, Lawson & Jacobi, 2008). Monitoring is required so that managers can be informed about usage patterns, determine the location, severity and extent of biophysical and other impacts (Eagles, McCool, & Haynes, 2002; Tanner & Nickas, 2007), and assess the effectiveness of management measures (Newsome, Moore & Dowling, 2013).

### 1.1. Nature of recreational impacts

The biophysical effects of recreational trampling and camping in natural settings have been well-studied (Cole, 2004; Marion et al., 2016). Impacts typically include damage to and loss of vegetation,

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http://dx.doi.org/10.1016/j.jort.2017.05.002
Received 14 August 2016; Received in revised form 13 May 2017; Accepted 25 May 2017

changes in species composition, soil compaction, erosion, and the development and deterioration of defined walking corridors (i.e. tracks or trails) and campsites (Cole, 2004). Post-impact recovery is often slow, particularly in alpine environments (Leung & Marion, 2000). The relationship between recreation use and impact has often been described as curvilinear, with low usage causing disproportionately high impacts (Hammit, Cole, & Monz, 2015; Marion, Leung, Eagleston & Burroughs, 2016). However, the use-impact relationship can take other forms, and some studies have proposed a sigmoidal relationship (Cole, 2013; Dixon & Hawes, 2015).

### 1.2. Walking tracks

Walking tracks are generally subject to ongoing physical deterioration unless they are designed sustainably (which generally requires low gradients, with tracks aligned more closely to contours than fall lines) or are located on self-maintaining substrates that resist erosion (Leung & Marion, 2000), otherwise poorly-designed trails require extensive hardening to be sustainable (Marion & Wimpey, 2017). The deterioration of unimproved walking tracks, often visitor-created, on which no stabilisation or hardening works have been undertaken poses a serious management problem in many natural areas worldwide (Leung & Marion, 2000), especially as soil loss is generally considered irreversible (Olive & Marion, 2009). In addition to environmental impacts associated with gullying, track widening, quagmire development and track braiding or duplication, track deterioration can at the same time adversely affect the recreational experience of walkers (Lynn & Brown, 2003).

The factors that predispose unimproved tracks to degradation have been well studied, with key factors being gradient, track alignment relative to topography, drainage and substrate characteristics (e.g. Leung & Marion, 1996, 2000; Dixon, Hawes & McPherson, 2004; Olive & Marion, 2009; Marion & Wimpey, 2017). Impacts on soil (erosion and loss), especially water-based erosion problems, are perhaps the most significant long-term recreation impacts as most are irreversible (Marion, Leung, Eagleston & Burroughs, 2016). Trail conditions typically vary along a trail, indicating that they are a function of trampling magnitude and local physical properties (Olafsdottir & Runnstrom, 2013). Well designed and constructed trails are not only sustainable with respect to trampling impacts (Marion & Wimpey, 2017) but also provide resilience to natural erosional factors such as extreme rainfall events (Tomczyk, White & Ewertowski, 2015).

### 1.3. Campsites

Campsite conditions have a substantial influence on recreational values because visitor experiences are particularly influenced by what they find at campsites (Flood, 2003). Flood further notes that, whether managers choose to ignore or restore (i.e. harden or close, and perhaps attempt rehabilitation insofar as that may be possible) heavily impacted campsites, their decisions have a significant effect on the quality of visitor experience.

Campsite impact is inevitable with repetitive use, and occurs rapidly but recovers slowly if use ceases (Cole, 1989, 1994, 2004). Cole further notes that the magnitude of impact at a given campsite is determined by environmental characteristics that influence its durability, the frequency of use it receives and the spatial distribution of such use. Smith and Newsome (2002) noted that high-use formal campsites were larger and more severely impacted than low-use, informal campsites. Studies in the USA have concluded that vegetation type is the best predictor of campsite durability (Marion & Cole, 1996). In Tasmania, long term observations of highland campsites suggest grasslands are the most robust alpine camping substrate (Photo 1). This is consistent with the results of experimental trampling studies in both Tasmania (Whinam & Chilcott, 1999) and the Australian Alps (Growcock & Pickering, 2011).

**Photo 1.** Naturally trampling-resistant grassy campsite (condition class 1; see Table 4) adjacent to old Waterfall Valley hut, Overland Track, Tasmania.

Studies suggest that many substantial changes on some sites occur by the time a campsite receives only 10–15 nights of use per year (Cole, 1995a; Marion, 1996). Specifically, early changes typically include a substantial loss of vegetation and pulverisation and loss of organic litter, whereas the exposure of mineral soil appears later in the progression of impacts and is related to use in a more linear fashion (Marion, 1996).

Marion (2016) observes that campsites are often created by visitors during peak use periods when campsite occupancy rates are high, but that subsequent use of even a few nights/year is then sufficient to prevent their recovery. Cole (1994, 2013) describes a “campsite impact history” involving rapid early deterioration and later dynamic equilibrium (at least with respect to vegetation loss and soil compaction). He further states (2013) that aggregate campsite impact within a region is more reflective of the number of campsites than the magnitude of impact on individual campsites, although on individual campsites, expansion can be particularly problematic (Marion 1996; Marion & Farrell, 2002).

Marion and Cole (1996) studied soil and vegetation impacts at campsites and noted that near-maximum impact intensities were produced very quickly at any location that was repeatedly disturbed. They hypothesised that such relationships were the norm for chronic disturbances of high intensity and low areal extent, concluding that management actions which concentrate the disturbing agent are likely to be most effective in minimising overall impact levels.

Cole and Monz (2004) note, given pronounced differences in the susceptibility of different plant communities, campsite selection is very important as a means of limiting impact but, in discussing the use-impact curve, they note that use levels must be very low and/or resistance very high to capture the portion of the curve below the threshold of rapidly increasing impact.

### 1.4. Management options

A variety of management techniques have been developed to mitigate recreational impacts (Leung & Marion, 2000; Marion, 2016). They include hardening tracks and campsites, redirecting visitation through regulation or education, modifying visitor behaviour, and modifying visitor expectations. Each technique has its advantages and limitations, and the choice of technique(s) to address a particular impact will depend on a range of factors including cost, likely effectiveness and the impact of the technique on recreational values.

Marion (2016) notes the curvilinear use-impact relationship implies that reducing use on well-established moderate- to high-use tracks and campsites is unlikely to appreciably diminish vegetation and soil impacts, unless very substantial reductions occur. In contrast, limiting use within the low-use zone, where impacts develop rapidly, can lead to substantial reductions in impact. However, this zone occurs at relatively low levels of use, generally between 3 and 15 nights of camping per year or 50–250 passes per year along a trail (Cole, 1995a, 1995b; Marion, 2016).

Hence, reducing use on a heavily used trail by (say) 20% is unlikely to result in any meaningful improvement in trail conditions (Marion,