

Loynes, Christopher ORCID logoORCID: <https://orcid.org/0000-0002-9779-7954>
(2018) Leave more trace. *Journal of Outdoor Recreation, Education, and Leadership*, 10 (3). pp. 179-186.

Downloaded from: <http://insight.cumbria.ac.uk/id/eprint/3970/>

Usage of any items from the University of Cumbria's institutional repository 'Insight' must conform to the following fair usage guidelines.

Any item and its associated metadata held in the University of Cumbria's institutional repository Insight (unless stated otherwise on the metadata record) may be copied, displayed or performed, and stored in line with the JISC fair dealing guidelines (available [here](#)) for educational and not-for-profit activities

provided that

- the authors, title and full bibliographic details of the item are cited clearly when any part of the work is referred to verbally or in the written form
 - a hyperlink/URL to the original Insight record of that item is included in any citations of the work
- the content is not changed in any way
- all files required for usage of the item are kept together with the main item file.

You may not

- sell any part of an item
- refer to any part of an item without citation
- amend any item or contextualise it in a way that will impugn the creator's reputation
- remove or alter the copyright statement on an item.

The full policy can be found [here](#).

Alternatively contact the University of Cumbria Repository Editor by emailing insight@cumbria.ac.uk.

1 **Leave more trace**

2 **Chris Loynes**

3 **University of Cumbria**

4
5 **Abstract**

6 Outdoor educators are adapting practices to respond to the priorities of education for
7 sustainability. New practices are emerging or adopted from elsewhere. In Europe, the American
8 recreational movement of Leave No Trace (LNT) has influenced environmental education
9 programs. LNT has been criticised for encouraging a reduction in environmental impact in
10 wilderness areas whilst ignoring the more significant impacts of equipment purchase, travel and
11 modern lifestyles. This paper extends the critiques of LNT suggesting that it encourages attitudes
12 of a separation from nature. It is suggested that the LNT concept is unrealistic and unhelpful in
13 Europe where most landscapes have experienced the impact of humans for millennia. The author
14 suggests that, inspired by European approaches of human nature relations and at a time of need for
15 significant environmental changes, educational programs seeking to connect people with nature
16 could encourage people to ‘leave more trace’ or, perhaps, to ‘consider their trace’ instead.

17
18 **Keywords**

19 environmental education; education for sustainability; environmental citizenship

20

1 **Introduction**

2 As the complex inter-relationships between culture and nature are better understood so are
3 the harmful consequences of some human activities on the natural world. Many organisations,
4 projects and programs have arisen to mitigate this harm or restore the damage done. One such
5 program is the 'Leave No Trace' program that began in the USA with the intention of reducing
6 the impact of recreational visitors to wild landscapes. The long running program has attracted
7 attention worldwide. In North America and Europe, a number of environmental education
8 programs have adopted the approach. This paper reflects on the efficacy of this cultural adoption
9 in a European landscape and considers whether leaving no trace is the appropriate approach for
10 educational organisations to take when seeking to engage their students with environmental
11 concerns.

12 Many commentators discuss the consequences of the age of modernity and its focus on
13 improving the human condition by raising standards of living. Whilst prosperity has clearly
14 delivered an enhanced life style for more and more people globally, the environment has been
15 treated as a set of unlimited resources (Jackson, 2017). It is increasingly clear that a society based
16 on continued growth on a finite planet will reach limits to that growth. According to Steffen et al
17 (2015), those limits have already been surpassed in a number of crucial areas and society is
18 perilously close to others.

19 The limits to growth, first recognised in what became known as the Bruntland report,
20 (World Commission on Environment and Development; 1987), has led to campaigns for a more
21 sustainable society living within its means which reached its global political peak with the 1992
22 Rio Declaration on Environment and Development (United Nations, 1992). To achieve a

1 sustainable future Jackson (2017) argues for a new definition of prosperity and Clayton et al (2017)
2 for a new relationship with nature.

3 Beery (2014) argues that LNT strengthens the modern view of humans as separate from
4 nature as it is necessarily predicated on the idea that humans are apart from nature and not a part
5 of nature. Rawles (2010) argues that the concept of separation, a consequence of the on-going
6 enlightenment project supported in practice by industrialisation and urbanisation, is an important
7 part of the environmental problem. She suggests that when humans are perceived as apart from
8 nature, nature ‘matters’ less, people care less, and we trash it more.

9 Discussions worldwide in the field of the outdoors, both recreation and education, are
10 exploring the contribution that can be made to encouraging sustainable human nature relations
11 (Orr, 1992; Higgins, 1996; Cooper, 1998; Bonnett, 2004; Martin, 2004; Wattachow & Brown, 2011;
12 Henderson & Vikander, 2012; Ross et al, 2014). As these authors argue, this shift is congruent
13 with the environmental needs of an urbanised, industrialised consumer society that is rapidly
14 globalising (Alagona & Simon, 2012). Modern life distances the majority of people from
15 experiences in nature. In the rush to protect what is left of nature Bonnett (2004) argues that
16 humans have set it aside behind boundaries and, in some cases, barriers conceptually excluding us
17 from it and it from us. Minimising human impact on these protected areas has become the dominant
18 form of action of those concerned about the health of nature. I suggest that, even in attempting to
19 care for nature, nature is therefore treated as something other than human and that humans consider
20 their impact on it only when they are present in it, that is in the special places humans have
21 designated as ‘natural’. The authors above all argue that separation works against pedagogies of
22 sustainability. The evidence for a different approach, widely termed ‘connection with nature’, has
23 become well enough established to move from Louv’s (2009) call to arms to one that influences

1 government policies [for a UK example see Lovell's evidence review (2016)]. The concern for a
2 lack of connection with nature, especially amongst young people, is gaining traction rising up both
3 the educational and the political agenda. Many pedagogic approaches have emerged that seek to
4 restore the connection (Orr, 1994; Cooper, 1998; Bonnett, 2004; Waite et al, 2016). Their
5 arguments are various. They include the suggestion that humans evolved in nature and so need to
6 be in it in order to flourish (Richardson et al, 2016), biophilia as Wilson (1990) called it; that
7 people learn better in nature; that natural or wild play promotes healthy personal and social
8 development and mental health; active time in the outdoors promotes physical health; and that
9 embodied, felt and cognitive experiential knowledge of nature is essential to compliment abstract
10 knowledge of the environment in order to develop caring attitudes and behaviours (Lovell, 2016).

11 'Leave No Trace' seeks to minimise impact and, I have argued, can be understood as
12 distancing people from rather than connecting people with nature. As a thought piece, I propose
13 the approaches of 'leave more trace' or, perhaps, 'consider your trace' as alternatives. The
14 intention is to examine the efficacy of 'Leave No Trace' in North America and in Europe as an
15 approach to environmental education and education for sustainability.

16 **The 'traces' left by LNT in the USA**

17 At face value the LNT ambition seems unquestionably a good thing. However, it is argued
18 that, in many cases it is either turning a blind eye to the more significant human impacts on nature
19 of visiting a wilderness area or introduces an ethic that could be counter to sustaining rich
20 natural/cultural landscapes.

21 In the USA, the LNT organisation sets out to promote the ethic that will minimise human
22 impact on public lands (<https://lnt.org>). The seven principles of the organisation focus on human
23 behaviour during a visit to public land. They are 'plan ahead and prepare'; 'travel and camp on

1 durable surfaces'; 'dispose of waste properly'; 'leave what you find'; 'minimize campfire
2 impacts'; 'respect wildlife'; and 'be considerate of other visitors'. It has a big presence on Twitter,
3 Facebook and You Tube, provides trainer training and offers various forms of public engagement
4 for those accessing US public lands for recreation. The movement claims to have reached millions
5 of recreational land users. Research suggests that the messages do make a difference to the
6 knowledge and behaviour of users. However, there is less evidence for any impact on the quality
7 of the visitor experience or on the land resource itself (Vagias, 2009).

8 Chambers et al (2000) argue that the intention of LNT, whilst well meaning, ignores the
9 many impacts that are the result of human behaviour when not visiting public lands, the ecological
10 and, especially, the carbon footprint of everyday life. More directly, they claim LNT ignores the
11 impact of the travel involved to visit public land and the consumption and use of specialist
12 equipment on the trip (see, for example, Orr, 2004 for an environmental education perspective).
13 Arguably, these impacts are far more significant on the health of the ecosystems of public lands
14 and elsewhere. This opens the LNT concept to criticism. Alagona and Simon (2012) point out that
15 the reduced impacts claimed by the program are minimal in the context of the wider human
16 footprint on the place visited and the planet as a whole. This would challenge the value of LNT as
17 a means of education for sustainability. For example, packing out rubbish from an area, whilst
18 laudable, is a small contribution when the carbon footprint of your travel to visit the area is ramping
19 up climate change that is a significantly larger threat to the land by several orders of magnitude
20 (Alagona and Simon, 2012; Rawles, 2013). It is similar to the story told by Berners-Lee (2010) of
21 the person discussing with a friend the relative merits of hand towels or electric hand driers and
22 their respective carbon footprints whilst in the bathroom at the airport and about to catch a plane.

1 To address this issue Alagona and Simon (2012) argue for an extension of the LNT
2 approach beyond public land and wilderness areas to all landscapes and as a political as well as
3 practical action. Whilst this paper has no argument with Alagona and Simon’s call for human
4 society to reduce some of it’s ‘trace’ or impact on the planet I suggest that LNT is inappropriate
5 and maybe counterproductive as an environmental education message. Indeed, I will argue for a
6 ‘hands on’ rather than a ‘hands off’ approach.

7 **Human ‘traces’ in the European landscape**

8 Of course, it can be argued that the LNT approach has value in fragile ‘wilderness’
9 settings. However, in Europe the areas that can truly be called wild land are few and far between
10 (Agnoletti, 2006). Human relationships with nature in Europe have historically evolved
11 differently to those in the USA. Even the uplands and the Arctic tundra have been grazed
12 extensively leading to a current and sometimes fragile balance between people and other species.
13 European national parks are cultural as well as natural places. Humans have left a big footprint
14 over thousands of years as Phillips (2015) discusses in his comparison of the American
15 wilderness concept with the cultural landscape of the Alps. This contrast might inform a different
16 land ethic to that of LNT, one that could be considered for its contribution to recreational land
17 use and environmental education.

18 Most of our ecosystems have co-evolved with humans as one of, and often the most
19 influential species (Crane, 2016). This has led to centuries of co-existence sometimes with
20 significant positive impacts on biodiversity. For example, coppiced woodlands (Rackham, 2015)
21 and flower rich meadows (Peterken, 2013) are some of the most bio-diverse habitats in the
22 temperate zone developed in relation to human management over centuries of practice. They
23 support species adapted and specific to them as habitats. These are now considered threatened as

1 old farming and woodland management practices decline. Therefore, these and other similar
2 habitats have become the subject of conservation strategies even though the habitats are, or were,
3 intensively managed by humans. Restoring these old practices has become essential for the
4 health of these rich ecosystems.

5 In other cases, land management has led to substantial challenges to biodiversity. The
6 uplands of the UK, for example, are claimed by some to be overgrazed by intensive sheep farming
7 leading to species poor habitats compared with the mixed and more bio-diverse habitats that would
8 emerge under different management plans (Mansfield, 2018).

9 In both situations humans are the keystone species. Like the Yellowstone wolves who,
10 upon their reintroduction, restored some of the balance to the ecosystems of that park (Ripple and
11 Beschta, 2003), humans in Europe can be key positive influencers on the quality of ecosystems
12 and biodiversity – or not as the case may be. It is contextual as, unlike the wolves, humans are
13 capable of developing different ways of living not all of which are sustainable. It is human nature,
14 and I use the word nature here intentionally, to knowingly construct cultures. If, at this time, people
15 need to transform those cultures into sustainable ones, my question is will this be best served by
16 encouraging a ‘hands off’ or a ‘hands on’ approach?

17 Both these situations of so called rich and poor habitats are the result of human
18 management strategies and both will require significant human intervention to sustain or transform
19 them. In these cases, in order to protect and sustain the habitats and the wildlife people have come
20 to value as part of our culture, perhaps the response is better described as ‘leave more trace’. This
21 argument has also been made by Turner (2002) who argues for an approach that engages
22 recreational users in the sustainable use of the natural resources of wild places and, in so doing,
23 can also minimise the material consumption of equipment that is a significant part of the

1 outsourced environmental footprint of a wilderness backpacker carrying tent, stove and dehydrated
2 meals. Fenton (2016) argues that bushcraft, an educational approach to nature that engages people
3 through the craft of living on the land, both minimises impacts and develops a sustainable land
4 ethic.

5 **The ‘traces’ of environmental education**

6 The North American approach of ‘Leave No Trace’ (LNT), an approach that seeks to
7 encourage care for nature amongst outdoor recreators, has been adopted by some North American
8 environmental education programs. The National Outdoor Leadership School (no date) ‘apply
9 Leave No Trace principles to camping and travel’. LNT has also crossed the Atlantic to Europe.
10 LNT training programs are offered by recreational organisations in Ireland, Scotland and England.
11 They have also been adopted as principles of practice by a number of environmental education
12 organisations including national educational programs and European wider outdoor education
13 providers. The term LNT is also widely used to describe a principle of practice amongst
14 professional environmental and outdoor educators. However, different principles, resonant with
15 the different history of humans in the European landscape discussed above, are also evident.

16 The following case study highlights the differences. The UK wide environmental education
17 charity explicitly uses LNT as a way to articulate its approach to education. However, as a program
18 committed to education for sustainability, its actual practice, conducted in urban green spaces and
19 rural neighbourhoods as much as in the wilder landscapes of Britain, indicates that the organisation
20 practices a different approach to the traces they believe they make.

21 **The John Muir Award: a case study of more or less ‘trace’**

22 The John Muir Award (JMA) is the educational arm of the John Muir Trust, a wilderness
23 charity that promotes and defends the interests of ‘wild’ land primarily in Scotland. Despite its

1 adoption of the LNT approach, the JMA leaves a considerable trace both in wild places and in
2 nature more widely through its award scheme. The award scheme encourages groups of people to
3 find, learn about and do something for a place and then tell others about the place and the work.
4 In a recent study (JMA, 2016) the JMA claimed (based on a survey of 81% of participants) to have,
5 in one year achieved:

- 6 • 63,103 metres of footpaths maintained and created.
- 7 • 29,939 square metres cleared of invasive species.
- 8 • 8,442 bin bags of litter cleared – more than the capacity of the Olympic Stadium.
- 9 • 1,382 metres of hedgerows created.
- 10 • 12,553 trees planted.
- 11 • 4,692 square metres of ponds restored or created.
- 12 • 4,160 metres of fences built or maintained.
- 13 • 18,000 square metres of meadow created.

14 This is hardly ‘no trace’ and is indeed considerably more trace than a group passing through
15 on a hike might have caused. Indeed, the report claims that, using Heritage Lottery Fund (a
16 national lottery and JMA funder) figures, the work done was worth £1.3 million. The difference
17 is, of course, that the trace has been considered by the group, and in some cases by the organisation
18 their work supports and has been considered as the right trace to leave enhancing biodiversity and
19 the opportunities for people to encounter flourishing habitats.

20 Of course, the LNT approach is a helpful way to put across the idea that humans should
21 and can minimise their harmful impacts in areas of high natural value. Perhaps one of its strengths
22 is that the scheme makes no judgement about whether that highly valued place is just down the

1 road in a wild patch surrounded by urban landscapes or a continent away in a place with little
2 human settlement.

3 From this perspective the JMA, despite adopting LNT, is a good candidate for ‘leave more
4 trace’. The same report would seem to endorse this view (JMA, 2016) with a quote from John
5 Muir:

6 *“It is not enough for people to be in sympathy with the plight of the natural world, but that*
7 *they must become ‘active conservationists’, as campaigners, as practical project workers, as*
8 *scientists, as artists, as writers.”* (p.1).

9 The evidence suggests that the JMA, practices an approach better described as leave more
10 trace in order to connect people with nature. Other research by Hayward (2012) suggests that the
11 nature of approaches such as the JMA program do more than connect people with nature. It
12 suggests that levels of engagement such as this lead to pro-environmental attitudes and pro-active
13 behaviours leaving ‘traces’ that, for the participants, reach beyond the direct interventions
14 encouraged by the program into other initiatives and everyday life.

15 Leave more trace’ may therefore be a better description of practice and a better guiding
16 ethic for environmental education. However, it also matters what this trace is, ‘consider your trace’.
17 It is more about leaving the right trace than none at all. Humans are a keystone species, that is a
18 species that, through its behaviours, has an impact on the entire ecosystem it inhabits. Leaving
19 only footprints and taking only photographs will not make places ‘better’ and leaving most places
20 as they are is not an option for any keystone species. Whilst it can be argued that leaving
21 substantially less traces in many aspects of our modern life style is a good, even a necessary action
22 to take, it can also be argued that there are many things that need doing which require us to ‘leave
23 more trace’. These actions have the added benefit of engaging people with nature in ways that

1 research indicates enhance their environmental values and change behaviours (Hayward, 2012).
2 Such an approach acknowledges that traces are inevitable and encourages debate about what traces
3 are reasonable, proportional and ethical; and what are not. Perhaps what humans should be seeking
4 is the restorative approach of living landscapes (Steiner, 2008) in which people intervene in order
5 to promote the flourishing of humans and other than humans alike. This has implications for
6 resident, recreational and educational communities in a landscape. As Alagona and Simon (2012)
7 hope, this means leaving more trace will inevitably become political and reach far beyond the
8 arena of protected areas as humans debate what needs and wants should be prioritised in each place
9 and assess the impacts of these choices on the other inhabitants and the ecosystems that sustain
10 both them and us.

11 **Conclusions**

12 LNT has value in that it alerts recreational users to the need to tread lightly in fragile
13 landscapes and that this approach does impact on of the behaviours recreational users of such
14 places. However, it does not pay any attention to the wider impacts of human behaviour in
15 travelling to wild lands or in everyday life which, in their turn, have a far more significant impact
16 on the fragile wild lands and nature everywhere. It has limited value as an ethic for everyday life.
17 This would suggest that LNT may not be the best ethic to adopt in environmental education
18 programs, especially those concerned with sustainability or practicing in the significantly less
19 wild landscapes of Europe and much of the rest of North America. Inspired by a different history
20 of human nature relations in Europe, I argue for an ethic of ‘leave more trace’ on the basis that
21 this has the potential to connect people and nature in ways that encourage them to ‘consider their
22 trace’. A case study illustrates how one environmental education program, despite using the LNT
23 rhetoric, is effective in leaving significant traces that are considered beneficial to people and

1 nature. Further tentative research findings indicate that programs such as this have the potential
2 to promote pro-active, pro-environmental behaviours in everyday life beyond the program. This
3 suggests that an ethic of ‘consider your trace’ is a more effective guide to and description of
4 effective environmental education in European landscapes and for programs concerned with
5 education for sustainability. This terminology may also be worth consideration for some North
6 American environmental programs.

7 **Acknowledgements**

8 I wish to thank Richard Ensoll who proposed the concept of ‘consider your trace’ during
9 a seminar critiquing an early draft of this paper.

10

References

- 1
- 2 Agnoletti, M. (ed) (2006). *The Conservation of Cultural Landscapes*. Wallingford, UK; CAB
- 3 International.
- 4
- 5 Alagona P. & Simon G. (2012). Leave No Trace Starts at Home: A Response to Critics and Vision
- 6 for the Future. *Ethics. Policy & Environment*, 15(1), 119-124. DOI:
- 7 10.1080/21550085.2012.672695
- 8
- 9• Beery, T. (2014). People in Nature: relational discourse for outdoor educators. *Research in*
- 10 *Outdoor Education*, 12, 1-14. DOI: 10.1353/roe.2014.0001
- 11
- 12 Berners-Lee, M. (2010). *How Bad Are Bananas?* Profile Books.
- 13
- 14 Chambers, N; Simmons, C. and Wackernagel, M. (2000). *Sharing Nature's Interest, ecological*
- 15 *footprints as an indicator of sustainability*. New York, NY; Earthscan.
- 16
- 17 Clayton, S., Colléony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A.-C., Truong, M.-X.
- 18 and Prévot, A.-C. (2017). Transformation of Experience: Toward a New Relationship with
- 19 Nature. *Conservation Letters*, 10(5), 645–651. DOI: 10.1111/conl.12337
- 20
- 21 Cooper, G. (1998). *Outdoors with Young People: A Leader's Guide to Outdoor Activities, the*
- 22 *Environment and Sustainability*. Lyme Regis, UK: Russell House.
- 23

- 1 Crane, N. (2016). *The Making of the British Landscape: from the ice age to the present*. London,
2 UK : Weidenfeld & Nicolson.
3
- 4 Fenton, L. (2016). *'Bushcraft' and 'Indigenous Knowledge': transformations of a concept in the*
5 *modern world*. (PhD), University of Kent.
6
- 7 Hayward, B. (2012). *Children, Citizenship and Environment*. London, UK: Routledge.
8
- 9 Henderson, B., & Vikander, N. (Eds.). (2007). *Nature First: outdoor life the Friluftsliv way*.
10 Toronto, Canada: Natural Heritage Books.
11
- 12 Higgins, P. (1996). Connection and Consequence in Outdoor Education. *Journal of Adventure*
13 *Education and Outdoor Leadership*, 13(2), 34-39.
14
- 15 Hinds, J., & Sparks, P. (2008). Engaging with the natural environment: the roll of affective
16 connection and identity. *Journal of Environmental Psychology*, 28, 109-120. DOI:
17 10.1016/j.jenvp.2007.11.001
18
- 19 John Muir Trust (2016). *Audit highlights £1.3 million of activity through the John Muir Award*.
20 Downloaded from [https://www.johnmuirtrust.org/latest/news/836-audit-highlights-13-million-of-](https://www.johnmuirtrust.org/latest/news/836-audit-highlights-13-million-of-activity-through-the-john-muir-award)
21 [activity-through-the-john-muir-award](https://www.johnmuirtrust.org/latest/news/836-audit-highlights-13-million-of-activity-through-the-john-muir-award)
22
- 23 Leave No Trace. *About Us*. Downloaded from <https://lnt.org/about>

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Linney, G. (2014). *Journeys into Relation*. Council of Outdoor Educators of Ontario. Downloaded from <http://www.coeo.org/integrated-programs.html>

Louv, R. (2009). *Last Child in the Woods: Saving Our Children from Nature-deficit Disorder*. London, UK: Atlantic Books.

Lovell, R. (2016). *Connection to Nature: evidence briefing*. Natural England Access to Evidence Information Note EIN015.

Mansfield, L. (2018). *Managing Upland Resources*. Dunbeath, UK: Whittles Publishing.

Martin, P. (2004). Outdoor adventure in promoting relationships with nature. *Australian Journal of Outdoor Education*, 8(1), 20-28.

National Outdoor Leadership School (no date). *Curriculum*. Downloaded from <https://www.nols.edu/en/resources/curriculum/>

Orr, D. (1991). *Ecological Literacy: Education and the Transition to a Postmodern World*: New York, NY: State University of New York Press.

Orr, D. (2004). *Earth in Mind*. Washington DC: First Island Press.

1 Peterken, G. (2013). *Meadows*. Totnes, UK: British Wildlife Publishing.

2

3 Phillips, A. (2015). *The Alps versus the Wilderness* [https://www.linkedin.com/pulse/alps-vs-](https://www.linkedin.com/pulse/alps-vs-american-wilderness-alex-l-phillips?loadAction=comment&midToken=AQGSputpv1Bg2w&trk=eml-mention-reply-mp-cmt&fromEmail=fromEmail&ut=2Xb8Qtq2fvx701)
4 [american-wilderness-alex-l-](https://www.linkedin.com/pulse/alps-vs-american-wilderness-alex-l-phillips?loadAction=comment&midToken=AQGSputpv1Bg2w&trk=eml-mention-reply-mp-cmt&fromEmail=fromEmail&ut=2Xb8Qtq2fvx701)
5 [phillips?loadAction=comment&midToken=AQGSputpv1Bg2w&trk=eml-mention-reply-mp-](https://www.linkedin.com/pulse/alps-vs-american-wilderness-alex-l-phillips?loadAction=comment&midToken=AQGSputpv1Bg2w&trk=eml-mention-reply-mp-cmt&fromEmail=fromEmail&ut=2Xb8Qtq2fvx701)
6 [cmt&fromEmail=fromEmail&ut=2Xb8Qtq2fvx701](https://www.linkedin.com/pulse/alps-vs-american-wilderness-alex-l-phillips?loadAction=comment&midToken=AQGSputpv1Bg2w&trk=eml-mention-reply-mp-cmt&fromEmail=fromEmail&ut=2Xb8Qtq2fvx701)

7

8 Rackham, O. (2015). *Woodlands*. London, UK: William Collins.

9

10 Rawles, K. (2010). A Copernican Revolution in Ethics. In Moore, K. D. and Nelson, M. P. (eds).
11 *Moral Ground: ethical action for a planet in peril*. San Antonio, Texas: Trinity University Press.

12

13 Rawles, K. (2013). Outdoor Adventure in a Carbon Light Era. In Pike, E.C. J. and Beames, S.
14 (2013). *Outdoor Adventure and Social Theory*. New York, NY: Routledge.

15

16 Richardson, M., McEwan, K., Maratos, F., & Sheffield, D. (2016). Joy and Calm: how an
17 evolutionary functional model of affect regulation informs positive emotions in nature.
18 *Evolutionary Psychological Science*, 2, 308-320. DOI: 10.1007/s40806-016-0065-5

19

20 Ripple, W. J., & Beschta, R. L. (2003). Wolf Reintroduction, predation risk, and cottonwood
21 recovery in Yellowstone National Park. *Forest Ecology and Management*, 184(1-3), 299-313.
22 DOI: 10.1016/S0378-1127(03)00154-3

23

1 Ross, H., Christie, B., Nicol, R., & Higgins, P. (2014). Space, place and sustainability and the role
2 of outdoor education. *Journal of Adventure Education & Outdoor Learning*, 14(3), 191 -197. DOI:
3 10.1080/14729679.2014.960684

4
5 Steiner, F. (2008). *Living Landscapes: an ecological approach to landscape planning*.
6 Washington DC; Island Press.

7
8 Steffen, W., Richardson, K., Rockstrom, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R.,
9 Carpenter, S.R., de Vries, W., de Wit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M.,
10 Persson, L.M., Ramanathan, V., Reyers, B. & Sorlin, S. (2015). Planetary Boundaries: Guiding
11 human development on a changing planet. *Science* 347 (6223). DOI: [10.1126/science.1259855](https://doi.org/10.1126/science.1259855)

12
13 Turner, J. M. (2002). From woodcraft to 'leave no trace': Wilderness, consumerism, and
14 environmentalism. *Twentieth Century America, Environmental History*, 7(3), pp. 462–484. DOI:
15 10.2307/3985918

16
17 United Nations (1992). *Rio Declaration on Environment and Development 1992*. Downloaded
18 from <http://www.jus.uio.no/lm/environmental.development.rio.declaration.1992/portrait.a4.pdf>

19
20 Vagias, W. (2009). An Examination of the Leave No Trace Visitor Education Program in Two US
21 National Park Service Units. *All Dissertations*. Paper 393.

22

- 1 Waite, S., Passy, R., Gilchrist, M., Hunt, A., & Blackwell, I. (2016). *Natural Connections*
2 *Demonstration Project, 2012-1016: Final Report* (215). Downloaded from
3 www.gov.uk/government/organisations/natural-england
4
- 5 Wattchow, B., & Brown, M. (2011). *A Pedagogy of Place: outdoor education for a changing*
6 *world*. Monash, Australia: Monash University.
7
- 8 Wilson, E. O. (1990). *Biophilia*: Cambridge, MA; Harvard University Press.
9
- 10 World Commission on Environment and Development (1987). *Our Common Future*. Oxford,
11 UK: Oxford University Press.