

THE HUMAN DIMENSION OF MARINE LITTER: THE IMPACTS ON US

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Marine litter, manufactured solid waste material that enters the marine environment, is a growing environmental concern (Galgani *et al.*, 2010). Found throughout the oceans, from the poles to the equator and from the shoreline to the deep sea, impacts of this debris on the environment and wildlife is well recorded. For example, rubbish items can have lethal and sub-lethal effects on marine dwelling organisms, through processes such as ingestion, entanglement, and chemical contamination from eating those materials (Gall and Thompson, 2015). Whilst the research examining the distribution, abundance, and impacts of litter on the environment and its inhabitants is ever growing, it is important to recognise the human dimension of this problem. Humans are unquestionably the source of the problem; optimistically, we are also the solution, but an often overlooked aspect is that we too are also impacted by marine litter. Here, this short article will briefly overview the impact litter has on individuals, the psychological value of doing something about it, and why this is important when trying to address this global and growing issue.

COMPROMISING THE RESTORATIVE PROPERTIES OF THE COAST

Coastlines are a popular leisure destination. In the UK alone, over 320 million visits are made to the coast each year (Natural England, 2013). Numerous studies have demonstrated that coastal settings can have restorative qualities for individuals. This can be in terms of improving people's attention and mood by simply looking at photographs of aquatic scenes (Laumann *et al.*, 2001; White *et al.*, 2010), people living closer to the coast reporting better overall health (Wheeler *et al.*, 2012), and people visiting coastlines feeling happier, revitalised and calm, especially compared to other natural environments (Ashbullby *et al.*, 2013; White *et al.*, 2013).

The presence of litter, however, can be seen to compromise these restorative properties. It may seem obvious that people do not like littered landscapes, and this has been found along with studies showing the economic expense of clearing up rubbish (Mouat *et al.*, 2010; Tudor and Williams, 2006; WHO, 2003), but what are the actual impacts on people's experiences? This has been explored using laboratory studies within the social sciences. For these studies, participants sit in a controlled setting and rate photographs according to a number of questions. Using this methodology, it has been demonstrated that the less pristine an environment is, the less restorative it is seen to be (e.g. burnt out cars in fields, surface foam on the water, Pretty *et al.*, 2005; Wilson *et al.*, 1995). When examining marine litter specifically, Wyles and colleagues (2016b) found that the littered environments had detrimental effects on individuals. By continually expanding an evidence base regarding the range of impacts marine litter has on the environment and on society, the social and natural sciences can further emphasise the importance of addressing this issue and the need to act sooner rather than later.

BEACH CLEANS – GOOD FOR THE ENVIRONMENT, BUT WHAT ABOUT THE VOLUNTEER?

One approach to help dealing with this issue is volunteer beach cleans. There are a number of campaigns across the globe that engage the general public with this issue by removing litter from the shore and/or contributing to a citizen science project where the litter is recorded and later analysed (Nelms *et al.*, 2016). Volunteering schemes in general have been seen to promote health and well-being (e.g. people enjoy and get a sense of meaning from participating in such events), can be educational for the individual, and can be associated with pro-environmental behaviour (people can intend to engage in more pro-environmental acts in the future; e.g. Evans *et al.*, 2005; Meier and Stutzer, 2008). However, the impact of engaging in a beach clean was less clear cut: it could have *positive* impacts in line with the other volunteering studies, or have a *detrimental* effect as its focusing individuals' attention to litter which was earlier demonstrated in the laboratory to have negative impacts (Wyles *et al.*, 2016b).

To examine this, individual experiences of a beach clean were explored and compared to two other activities: a rock pool ramble, exploring the pools of water for wildlife and undertaking the Shore Thing citizen science project; and a coastal walk, the most common activity undertaken on the coast (Wyles *et al.*, 2016a). Using an experimental field design, it showed that beach cleans had a number of benefits on the individual, partly because of the environmental setting (as all three activities had similar outcomes) but some impacts were found to be unique for the beach cleaning activity specifically.



Whilst marine litter, when left, can be detrimental to our experiences of the coast, doing something about it can have numerous knock-on effects. This can be from feeling good about oneself; encouraging individuals to volunteer again in the future, which then further increases the army of citizens taking to the coasts to collect rubbish; and to raise awareness of this issue, making it more prominent within the general public (Wyles *et al.*, 2016a). These impacts are especially important as conservation behaviours can be motivated by three viewpoints: biospherism (wanting to protect nature for its own sake), anthropocentrism (wanting to preserve nature in order to continue to maximise its functions that benefits us), and egobiocentrism (wanting to looking after nature because we enjoy our time in nature; Amerigo *et al.*, 2007). Thus, beach cleans can be promoted as an activity to help the environment (biospherism), can help preserve the numerous functions the environment offers when not under threat from marine litter (anthropocentrism) and because you feel good when doing it (egobiocentrism). Consequently, by combining the impacts litter has on the environment and wildlife with the impacts it has on individuals and the benefits of doing something about it, the social and natural sciences can be an ideal marriage, further emphasising both the problem but further empowering us to act.

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