Environmental Management and Visitor Self-Assessment: Reducing transfer of plant propagules towards and inside Antarctica

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Globally, many thousands of species have been redistributed beyond their natural dispersal ranges as a result of human activities. The introduction of non-native species can have severe consequences for indigenous biota with changes in both ecosystem structure and function. The Antarctic region has not escaped this threat. The numbers of established non-native species and the number of individuals of these species is growing. Possible future increases in human presence in the region, either through tourism, governmental operations or other commercial activities, will increase the risk of further non-native species introductions, while climate change may enhance the likelihood of establishment and range expansion. Information to help reduce potential impacts is therefore critical.

In our research we focused on propagule load of seeds, and fragments of bryophytes and lichens, during the 2007/08 austral summer, sampling different categories of visitors associated with national research programs and tourism, and different categories and ages of clothing and gear. We also collected information about the timing of travel and the regions visitors had been to prior to Antarctic travel. Seeds were found in 20% and 45% of tourist and science visitor samples, respectively. For bryophyte and lichen fragments the proportions were 11% and 25%, respectively. Footwear, trousers and bags belonging to field scientists were the highest risk items, especially if those personnel had previously visited protected areas, parklands/botanic gardens or alpine areas. Of the tourists, those who visited rural/agricultural areas prior to travel, and/or travel with national programs or on smaller tourist vessels had the highest probability of transferring plant propagules. Travel either during the boreal or austral autumn months increased the probability of propagule transfer.

Our assessment provides a basis for targeted management of biological invasions both through regulatory frameworks and visitor self-assessment.

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