SUSTAINABLE TOURISM CRC

Fact Sheet

Tourist Pressure Index (TPI): predicting the spatial distribution of visitors within protected areas


a

Authors: Wade Hadwen *(Griffith University)*, Angela Arthington *(Griffith University)* and Paul Boon *(Victoria University)*.

October 2008


b


c

Images

a: *Cunningham's Gap, Main Range National Park*

b: *The reputation of sites plays an important role in determining visitor numbers. Lake McKenzie, Fraser Island World Heritage Area. Photo: W. Hadwen.*

c: *Accessibility has a strong influence on site visitation levels. Lake Garawongera, Fraser Island World Heritage Area. Photo: W. Hadwen.*

Background

Protected areas are often established on the basis of a few key sites possessing exceptional biological and/or physical attributes. These sites tend to become the focus of visitor activities, with the natural and built features around them serving to funnel visitors to these special areas within parks. As a result, visitors are not evenly spread throughout a protected area.

Within a protected area, there is typically very little information available on which sites receive the highest visitor numbers and why.

In this research project, we developed a predictive model of the spatial distribution of visitors within a protected area. Our aim was to develop a user-friendly model to assess the relative importance of numerous sites within a protected area. Ultimately, the model should provide protected area managers with a standardised, semi-quantitative basis for decision making with respect to the management of visitors within their protected areas.

Approach

To predict the spatial distribution of visitors within protected areas we examined the range of features that are known to influence visitor decisions regarding which sites to visit within any given park. For many protected areas, particularly those in remote areas, there are six key features that influence the likelihood of visitation:

The amount of publicity surrounding the site and its reputation (**P**)

The quality of road access to the site (**R**)

The accessibility of key site features
(ie. type and length of track from car park) (**A**)

Distance to nearest settlement or park access point (**S**)

Distance to nearest camping area or other accommodation (**C**)

Distance to nearest toilets (**T**)

Together, these features can be incorporated into a simple semi-quantitative model to examine differences in the likely visitor numbers at a range of sites within a single protected area.

The TPI model is:

TPI = [(P+R+A) / (S+C+T)] x 100

High TPI scores indicate relatively high tourism pressure, or high visitor numbers, whereas low TPI scores suggest that the site is unlikely to be subjected to high human traffic.

An example – TPI scores and thresholds of concern for management

In an application of the TPI model to a selection of 15 Fraser Island lakes (Hadwen et al. 2003), the model generated TPI scores ranging from 2.7 to 61.2 (Figure 1). Within this range, we identified two key thresholds for management response, namely '**Early Warning**' and '**Management Action**' thresholds.

SUSTAINABLE TOURISM CRC


d

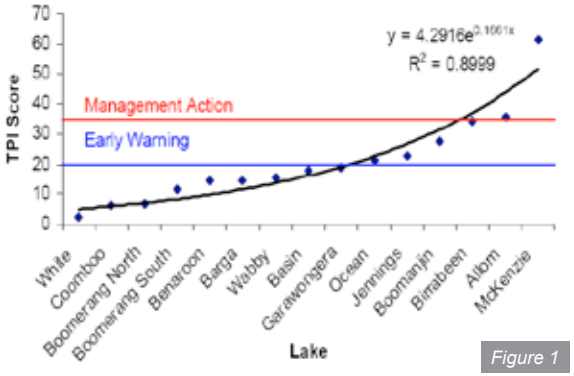

Figure 1


e

Images
d: *Granite Boulders, Girraween National Park*

e: *Rainforest, Lamington National Park*

*Figure 1. Tourist Pressure Index (TPI) scores for 15 lakes on Fraser Island, with nominated '**Early Warning**' and '**Management Action**' thresholds.*

At 'Early Warning' thresholds, it may be necessary to initiate monitoring programs to assess the effects of visitor use on site integrity and ecological health. At 'Management Action' thresholds, visitor-management strategies may need to be initiated to ameliorate the likelihood of deleterious ecological impacts and their consequences for the condition of valuable ecosystems.

Rules for setting thresholds of concern

It is important to note that thresholds of concern should be determined in conjunction with some ecological information (if possible). For example, using the TPI calculations for Fraser Island, we identified a number of lakes at risk due to the combination of high visitor numbers and ecological sensitivity.

Application of the TPI model (with ecological data) can be found in: Hadwen, W. L., Arthington, A. H. and Mosisch, T. D. (2003) The impact of tourism on dune lakes on Fraser Island, Australia. Lakes and Reservoirs: Research and Management 8: 15-26.

Applying the TPI to other protected areas

TPI scores and thresholds are calculated separately for each protected area on the basis of what is known of the visitation, ecology and infrastructure within the park. However, current research aims to further refine the model to more accurately relate model variables to visitor decision-making processes and to standardise its applicability across a broader range of systems and situations. Future applications across multiple protected areas simultaneously will test the applicability of the TPI model as a regional tool to assess visitor management and the sustainability of tourism resources.

TPI assessment of the spatial distribution of visitors within protected areas represents a time-efficient and objective analysis of where monitoring and management resources may need to be focussed.

For more information, copies of the TPI paper and discussion of the TPI model and its use, please contact: Dr Wade L Hadwen, details below.

For more information please contact:
Dr Wade L Hadwen
Sustainable Tourism Cooperative Research Centre
Australian Rivers Institute
Nathan Campus Griffith University, Queensland 4111
Email: w.hadwen@griffith.edu.au
Telephone: +61 7 3735 3987 Facsimile +61 7 3735 7615

Sustainable Tourism Cooperative Research Centre
Gold Coast Campus
Griffith University, Queensland 4222
Bookshop: www.crctourism.com.au/bookshop
Email: info@crctourism.com.au
Telephone: +61 7 5552 8172 Facsimile: +61 7 5552 8171