



Short communication

## Visitors to protected areas in China

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### ABSTRACT

Conservation managers worldwide need social science information on visitors to protected areas, as well as natural science information on species and ecosystems. Visitor attitudes and behaviours differ considerably between countries and cultures, and these differences influence environmental impacts and management effectiveness. We present the first large-scale multi-site study of motivations, activities, satisfaction and intentions for Chinese visitors to highly biodiverse, heavily-visited Chinese protected areas. At national scale, Chinese cultural attitudes to nature, animal welfare, and threatened species differ substantially from those in Western nations. Our results indicate that these differences are less marked for park visitors than for the general public. The main goal of Chinese park visitors is unstressed appreciation of nature in unpolluted environments, and they also enjoy adventure and cultural experiences. Differences appear only at finer scale, such as wildlife interactions and birdwatching expectations. Since 15% of Chinese park visitors plan their next park visit internationally, these results are also relevant for conservation in all countries that receive Chinese tourists. We suggest that Chinese park visitors might be able to catalyse broader Chinese cultural change in attitudes towards use of threatened species.

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### 1. Introduction

Conservation of biological diversity is both increasingly important and increasingly difficult (Barnosky et al., 2012; Hoffmann et al., 2015; Pimm et al., 2014; Saterberg et al., 2013). Human populations and impacts continue to increase; wildlife populations continue to decrease (Xie et al., 2015); and unmodified natural environments become increasingly rare and isolated (Buckley et al., 2016). Conservation relies heavily on protected areas (Hoffmann et al., 2015; Le Saout et al., 2014; Oldekop et al., 2015). These rely increasingly on political and economic support from tourism and recreation, especially visitors to protected areas (Buckley et al., 2012; Buckley et al., 2016; Palomo et al., 2014; Naidoo et al., 2016). Conservation pays a price for this support through the increased ecological impacts of more numerous and more demanding visitors to protected areas (Balmford et al., 2009; Buckley, 2009). The intensity of impacts from individual visitors may differ by three orders of magnitude, depending on their activities, attitudes and behaviours (Buckley, 2011). The motivations, activities, satisfaction and intentions of visitors to protected areas have thus become increasingly critical in conservation management worldwide.

In some continents, the psychology and behaviours of park visitors have been analysed extensively, and are incorporated routinely into operational planning, management and budgeting by protected area

management agencies (Leung et al., 2016). Park visitors behave differently, however, in different countries, cultures, and circumstances (Conway, 2013; Leung et al., 2016; Pearce, 2014; Tucker and Carnegie, 2014; Weiler et al., 2016). Conservation agencies in each country, and indeed at individual protected areas, therefore need information on visitors to their specific reserves. Currently, few parks agencies analyse the psychological factors driving visitors' decisions to visit a particular park, and their behaviour once they get there.

Here, therefore, we address these questions for highly biodiverse and heavily visited protected areas in China. China has a large area, a very large population, and high biodiversity (Ding et al., 2012; Li et al., 2015; Liu et al., 2015; Luo et al., 2015; Wu et al., 2011; Zhang et al., 2016a, 2016b; Zhao et al., 2016). It has a high degree of land conversion to primary production outside protected areas; numerous parks and nature reserves with high biodiversity and high visitation rates (Cao et al., 2015; Guo et al., 2015; Ren et al., 2015; Wu et al., 2011; Xie et al., 2015; Xu et al., 2014a, 2014b; Yang, 2012; Zhong et al., 2015a, 2015b); and considerable anthropogenic modification to most of its existing protected areas (Buckley et al., 2016a, 2016b).

Management of China's many categories of protected areas (Ren et al., 2015; Ministry of Environmental Protection, 1993; Zhong et al., 2015a, 2015b; Buckley et al., 2016a, 2016b) for the effective conservation of its threatened species and biological diversity despite high visitation, is thus of global conservation significance. The biodiversity and pristine nature of protected areas have been documented in some detail, but their many millions of visitors, an essential component in practical conservation, have remained largely unstudied except in

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localised cases. Here we examine visitor characteristics, using standardised approaches, for a national set of protected areas.

We focus particularly on potential differences between the attitudes and behaviours of Chinese park visitors, and those of their Western counterparts, which have been studied more extensively and form the basis for much of the international English-language park management literature (Lockwood et al., 2012; Leung et al., 2016). Chinese cultural attitudes towards nature have often been described as different from those in Western nations, with: less emphasis on the value of wilderness; greater emphasis on human health benefits of nature experiences and exposure; greater readiness to exploit threatened species, e.g. through consumption of traditional medicinal mixtures containing rare-species parts or extracts; and greater acceptance of very high visitation rates and large-scale infrastructure within protected areas (Foggin, 2014; Wang and Buckley, 2010; Wang et al., 2012; Xie et al., 2014; Xu and Fox, 2014; Xu et al., 2014b; Zhang et al., 2015; Zhong and Wang, 2011; Zhong et al., 2015a, 2015b; Zhou and Yu, 2004).

Cultural differences between China and Western nations have also been shown more broadly for all types of outdoor park, nature, wildlife and adventure tourism (Bao et al., 2014; Buckley, 2016; Buckley et al., 2008; Buckley et al., 2014; Cong et al., 2014a, 2014b; Du et al., 2016; He et al., 2008; Leung et al., 2014; Liu et al., 2012; Packer et al., 2014; Xu et al., 2014a, 2014b; Wang and Xu, 2014; Wang et al., 2012; Xu and Fox, 2014; Yang, 2012; Zhang et al. 2014; Zhang et al., 2015); and similarly, for outbound Chinese tourists travelling internationally (Jin and Sparks, 2017; Prayag et al., 2015; Sun et al., 2015; Wu, 2015; Wang et al., 2016).

Local-scale case studies of the motivations, awareness, experience and behaviour of protected area visitors in China have been reported at: Bitahai in Shangri-La, Yunnan (Xiao and Yang, 2004); Baihuashan near Beijing (Li, 2005a, 2005b); Taibai National Park in Shaanxi (Li, 2005a, 2005b); Mt. Yuntai in Henan (Chen and Qiao, 2010); Mao'er Mountain in Guangxi (Liang and Wang, 2013); Chengdu in Sichuan (Cong et al., 2014a, 2014b); and Jiuzhaigou in Sichuan (Du et al., 2016; Gu et al., 2013; Liu et al., 2012). There has apparently been no prior study, however, at national scale. Here we aim to provide such information, to assist the managers of China's protected areas in the conservation of its internationally significant biological diversity.

## 2. Materials & methods

We examine the motivations, activities, satisfaction and intentions of Chinese domestic visitors to five iconic, heavily visited, high-tier conservation reserves in China. The parks studied are: Jiuzhaigou Nature Reserve in Sichuan province, Wudalianchi Geopark in Heilongjiang, Zhangjiajie National Forest Park in Hunan, Jianfengling National Forest Park in Hainan, and Nitoushan National Forest Park in Zhejiang. Annual visitation rates to these 5 parks, and the proportions of overseas visitors, are summarised in Table 1. By far the majority of visitors to each park are domestic Chinese tourists. At each of these parks, questionnaires were administered in person to Chinese visitors, at various dates from January to May inclusive. Respondents were selected randomly, except that <5 members of any one organised package tour group were included. Each respondent completed the questionnaire independently. The overall structure of the questionnaires was first designed in English (Supplementary Table 1), to allow discussion between the authors,

and the final version was constructed and administered in Chinese, by the Chinese authors.

We asked respondents to rate the importance of: 13 different motivations; 11 different activities, as measured by the relative amount of time spent engaged in each; their level of satisfaction, and degree to which expectations were met, for 13 different features and factors relating to the particular park concerned; and the likelihood that they would engage in any of six different potential activities in future park visits. All these questions used 5-point Likert-type scales. In conjunction with the last of these, we also asked: whether they planned to visit a park on their next holiday; if so, whether it would be in China or overseas; and whether they would prefer mountains, forests, grassland or desert, rural or cultural landscapes, freshwater lakes or rivers, or coastal and marine areas. We asked about trip logistics: whether respondents visited the park alone, or with various types of group; how many times each year they visit a park or reserve or similar area; what means of travel they used to reach this particular park or reserve; and how many days in total the trip would take. To allow us to test for demographic patterns and representativeness, we recorded: gender; geographic origins (province); age, in six brackets; education, in four brackets; occupation, in 22 categories; and monthly income, in six brackets.

We graphed the frequencies of response categories for motivations, activities, satisfaction and intentions respectively, using broken-stick displays. Using the raw data, we tested for any significant differences between similar categories or groups of categories, using Fisher's Exact Test. We also tested 3 (out of ~230) possible a priori associations between each of these factors, and the various demographic parameters, to check for possible cultural differences between Chinese and Western park visitors. We tested whether interest in geological features is greater for older (more traditional) age brackets, and whether interest in bird watching is greater either for younger age brackets, or for higher income brackets.

## 3. Results

Of the visitors approached, 85% completed the survey in full. We received a total of 821 fully valid completed questionnaires: 254 at Jianfengling, 206 at Jiuzhaigou, 206 at Zhangjiajie, 117 at Wudalianchi, and 38 at Nitoushan. We first compared results between the 5 parks, but found no significant patterns, so we combined data from all 5 parks for subsequent analysis. These approaches generated a large data matrix (>45,000 cells), with each cell containing categorical data (Supplementary Table 2). Results are summarised in Fig. 1.

The principal motivations for Chinese visitors to Chinese protected areas are summarised in Fig. 1a. The leading motivational factors, reported as important or very important by 60–80% of respondents, are generic characteristics of park visitors worldwide: scenery, nature, an iconic site, relaxation, and escape from city life. Social factors such as sharing with family and friends, and specific attributes such as history and adventure, were rated as important or very important for 45–60% of respondents. Convenience, catering and new companions were rated as important or very important by <35%. Fewer than 25% visited simply since the park was part of a package tour.

The activities and experiences in which Chinese park visitors engaged during their park visits are summarised in Fig. 1b. Respondents were asked to rank importance in terms of the proportion of total time that they spent in different activities. Around 73% of respondents rated hiking on unformed trails, and taking photographs or videos, as important or very important. Around 45–55% of respondents said that walking on constructed tracks, learning about nature and geology, travelling between scenic lookouts by road or cableway, and learning about the geology, natural history and culture of the park were important or very important. <30% of visitors reported that buying souvenirs or taking guided commercial tours were important or very important. Interests specifically in geology and birdwatching are not associated significantly with age or income bracket.

**Table 1**  
Park visitation rates.

Park	Total visitors per year, 2015	Overseas visitors per year, 2015	Overseas / total, %
Jiuzhaigou	5,096,000	158,000	3.10
Zhangjiajie	3,370,000	212,000	6.29
Wudalianchi	1,380,000	95,000	6.88
Nitoushan	1,201,000	11,000	0.92
Jianfengling	418,000	4000	0.96

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