

**Institution: University of Roehampton**

**Unit of Assessment: 24. Anthropology and Development Studies**

**Title of case study: Effects of Tourism on Wild Primates**

### 1. Summary of the impact

This case study details the impact of a body of research exploring the effects of tourism on wild primates. Our findings have been communicated to a range of conservation organisations, government bodies, tourism associations and other parties, and used by them to promote wider public appreciation of tourism-related conservation issues, and to inform development of guidelines relating to primate tourism. In addition, we have engaged the public with this work through a range of traditional and online media. Through local, national and international consultation and collaboration, our research is having a significant impact on the wider approach to primate tourism.

### 2. Underpinning research

Since 2010, **Semple** and **MacLarnon's** research group has been undertaking a programme of research that investigates the negative effects of tourism on wild primate populations. Using the endangered Barbary macaque (*Macaca sylvanus*) in the Atlas Mountains of Morocco as a model system, we have applied a range of non-invasive techniques to assess emotional and physical effects of tourism on these animals. Despite clear concerns about the effects of human presence and behaviour on the well-being of tourist-exposed primates, to date systematic data on this issue have been extremely limited. A number of the approaches or lines of evidence we have used to assess such effects draw on a complementary body of research exploring fundamental questions related to primate social behaviour, stress and well-being. Here, we describe the three studies directly exploring tourism effects on wild primates that underpin this case study, as well as the more fundamental studies on which these draw.

(1) **Maréchal et al. (2011)**– this study explored effects of interactions with tourists on wild Barbary macaques, using behavioural measures of anxiety and non-invasive hormonal measures of the physiological stress response. Use of these two different measures was prompted by evidence from an earlier study by our group (Higham *et al.* 2009) that they reflect different aspects of the overall stress response in primates. Two key findings emerged from the work of Maréchal *et al.* (2011). Firstly, even very 'low level' primate-tourist interactions, such as tourists photographing the macaques, were associated with a significant elevation in the animals' anxiety levels. Secondly, aggressive interactions between macaques and tourists were linked to higher levels of stress hormones, indicating a chronic physiological response by the animals.

(2) **Majolo et al. (2013)** – in this chapter, we presented new data indicating that feeding of wild Barbary macaques by tourists dramatically increased levels of intra-specific aggression, and that close proximity of tourists reduced rates of social grooming. Separate research on free-ranging groups of Barbary macaques in the UK provided evidence that elevations of aggression are indicative of underlying increases in stress (Gustison *et al.* 2012), and that social grooming has an important function in mediating social relationships (Carne *et al.* 2011) and hence that disruption of normal grooming patterns may have detrimental social consequences.

(3) **Borg et al. (2013)** - this study provided evidence that exposure to tourism was linked to significantly greater body fatness, poorer coat condition and higher diversity of protozoan parasites among wild Barbary macaques. All three of these factors have been linked in the literature to poor health in animals.

In summary, the three studies that form the core of this case study provide evidence that exposure to tourism increases wild primates' anxiety and physiological stress levels, has detrimental effects on their social behaviour, and leads to increased body weight, poorer body condition and higher parasite load.

### 3. References to the research

#### Studies directly exploring tourism effects on wild primates

Maréchal, L, Semple, S, Majolo, B, Qarro, M, Heistermann, M & MacLarnon, A (2011) Impacts of tourism on anxiety and physiological stress levels in wild male Barbary macaques. *Biological Conservation* 144, 2188-2193. DOI 10.1016/j.biocon.2011.05.010. REF2.

Majolo, B, van Laviere, E, Maréchal, L, MacLarnon, A, Marvin, G, Qarro, M, & Semple, S (2013) Out of Asia: the singular case of the Barbary macaque. Pages 167-183, in *The Macaque Connection: Co-operation and Conflict between Humans and Macaques*. Eds. Radhakrishna, S, Huffman, M & Sinha, A. Springer: New York. DOI 10.1007/978-1-4614-3967-7

Borg, C, Majolo, B, Qarro, M & Semple, S (in press; publication December 2013) A comparison of body size, coat condition and endoparasite diversity of wild Barbary macaques exposed to different levels of tourism. *Anthrozoos*.

#### Supporting studies

Higham, JP, MacLarnon, AM, Heistermann, M, Ross, C and Semple, S (2009) Rates of self-directed behaviour and faecal glucocorticoid levels are not correlated in wild female olive baboons (*Papiohamadryasanubis*). *Stress* 12, 526-532. DOI 10.3109/10253890902756565

Gustison, M, MacLarnon, A, Wiper, S and Semple, S (2012) An experimental study of behavioural coping strategies in free-ranging female Barbary macaques (*Macaca sylvanus*). *Stress* 15, 608-617. DOI 10.3109/10253890.2012.668589

Carne, C, Wiper, S and Semple, S (2011) The reciprocation and interchange of grooming, agonistic support, feeding tolerance and aggression in semi-free-ranging Barbary macaques. *American Journal of Primatology* 73, 1-7. DOI 10.1002/ajp.20979

### 4. Details of the impact

The three key papers underpinning this case study provide novel insights into the potentially detrimental effects of tourism on wild primates. Findings have been communicated to a diverse audience of non-academic parties, have informed development of evidence-based guidelines relating to Barbary macaque tourism in Morocco, and to primate tourism generally, and have provided the basis for the regulatory framework and impetus to implement mitigation measures.

#### Promoting the research to enhance public understanding

Following a proactive and focussed press engagement campaign in June 2011, designed to maximise the reach of our communication, the research in Maréchal *et al.* (2011) was featured on the websites of news, travel and environmental organisations, including the front page of Channel 4 News, BBC Science and Environment, and Wanderlust. We also secured coverage by environmental bloggers, and online and in print in New Scientist magazine. We communicated the coherent set of findings of all three pieces of research underpinning this case study to a range of organisations. We wrote an opinion piece on primate tourism for the website of the UK charity, Care for the Wild, for their campaign 'Right Tourism'; this piece was also included in the Summer 2013 newsletter sent out to the 9,730 members of Care for the Wild. We contributed a blog piece on this work to the Moroccan Primate Conservation Foundation, an organisation working to conserve Barbary macaques in their native habitat. In addition, we wrote material about our research for the website of Trentham Monkey Forest, a conservation park holding a free ranging captive population of Barbary macaques (Stoke-on-Trent, UK). Following a meeting with the Director of Trentham Monkey Forest in April 2013 to discuss our findings in relation to effects of tourism on wild Barbary macaques, the results of these studies have since that time been included

in the educational talks at the park given to school, college and university students as well as members of the general public.

### **Informing guidelines for primate tourism – Barbary macaques (Morocco and Gibraltar)**

Following an invitation from the Moroccan Primate Conservation Foundation, **Semple** contributed to the *Conservation Action Plan for the Barbary macaque (Macaca sylvanus) in Morocco*, a plan drawn up for the Moroccan government by organisations including government authorities (Ministères de l'Agriculture et de la Pêche Maritime; Haut Commissariat des Eaux et Forêts), conservation NGOs (International Federation of Animal Welfare, Moroccan Primate Conservation Foundation), and academic institutions (Institut Scientifique de Rabat, Centre National de la Recherche Forestière, University of Roehampton). This Action Plan was drafted following a meeting in Azrou, Morocco, in October 2011. **Semple** attended this meeting to describe the key findings of our research on tourism, and to facilitate the translation of these findings into the practical recommendations of the Action Plan. The final Action Plan detailed a number of activities to reduce human impacts on Barbary macaque populations, including specific recommendations related to mitigating impacts of tourism that were based on our research findings outlined above. The Plan is now being implemented by government authorities and conservation NGOs in Morocco.

**Semple** was invited to a meeting in Azrou in January 2013, to discuss development of tourism related to wild Barbary macaques in Morocco. This invitation was from the Director of Ifrane National Park (where our field studies were carried out), who explicitly expressed an interest in hearing about the research findings in the three core studies underpinning this case study. The meeting was attended by senior officials from Ifrane National Park and from Haut Commissariat des Eaux et Forêts, and by representatives from regional tourism organisations and environmental associations. A presentation and contribution to panel discussions by **Semple** provided attending parties with information and empirical evidence about the potential negative effects of tourism on wild Barbary macaques, and how such effects may be avoided.

Since May 2012, **Semple** and **MacLarnon** have been collaborating with the Moroccan Primate Conservation Foundation as it develops a new eco-tourism project – *Monkey Watch* - in Ifrane National Park, Morocco. The Foundation have drawn on our research on primate tourism throughout the early planning stages of this project, and we have worked closely with them to ensure all appropriate steps are being taken to avoid negative effects on wild Barbary macaques of this new tourism venture.

In April 2013, **Semple** was invited by the Minister for Health and Environment in the Gibraltar Government, Dr John Cortes, to join a panel to advise on matters relating to the conservation and management of the Barbary macaque population in Gibraltar. Interactions between tourists and macaques are extremely frequent in Gibraltar and represent a key issue for the management of this population. **Semple** is providing expertise on this matter, and on others relating to conservation and management of these animals, in support of the Gibraltar Barbary Macaque Management Team.

### **Informing guidelines for primate tourism – general**

**Semple** was invited to contribute to the Association of British Travel Agents (ABTA) *Global Welfare Guidance for Animals in Tourism* (ABTA, 2013). He provided material on the welfare implications of wildlife viewing, covering three areas of tourist impact on primate welfare: impacts on stress levels, behavioural change and disease risk. For these, all three core studies described above were used to highlight key issues and contribute to the guidelines proposed as means to mitigate tourism impacts on wild primates. The findings of these studies were used as systematic evidence to inform the report's primary recommendations on the need to: 1. enforce a minimum tourist distance from wild primates; 2. prevent any physical interaction, even 'low level' forms, between tourists and primates; 3. mitigate or minimise the effects of tourist presence and/or behaviour on primates. The *Global Welfare Guidance for Animals in Tourism* was launched in June 2013. Key ABTA Member

organisations - TUI Travel, Thomas Cook, Virgin Holidays and Cosmos - have committed to using these guidelines to ensure that any wildlife tourism attractions that are offered in their holidays meet the minimum benchmark requirements. In addition, ABTA is distributing this document to governments and tourist boards in destination countries, and it is available to ABTA's 1,200 member organisations.

#### 5. Sources to corroborate the impact

1. Main online media coverage of Maréchal et al (2011): <http://www.bbc.co.uk/nature/13892428>; <http://www.channel4.com/news/monkeys-anxious-over-human-behaviour>
2. Blog entries about Maréchal et al (2011): <http://mpcfoundation.nl/news/tourism-and-barbary-macaques-in-morocco>; <http://www.wanderlust.co.uk/magazine/news/tourists-are-a-real-worry-for-macaque-monkeys-morocco-park>; <http://riadzany.blogspot.co.uk/2011/06/morocco-making-animals-anxious.html>; <http://whogivesamonkeys.com/2011/06/28/tourists-in-morocco-pose-a-threat-to-an-endangered-species-of-monkey/>
3. Care for the Wild newsletter Summer 2013, and accompanying online opinion piece (<http://right-tourism.com/issues/thoughts-from-the-experts/monkeys-and-tourism-a-price-to-pay/>)
4. Trentham Monkey Forest website: [http://www.trentham-monkey-forest.com/conservation.php?id\\_cat=2&id\\_sub\\_cat=10](http://www.trentham-monkey-forest.com/conservation.php?id_cat=2&id_sub_cat=10)
5. Letter from Ms Sue Wiper, Director of Trentham Monkey Forest, describing inclusion of our research findings in educational classes and talks given at the park. (Identifier 1)
6. *Conservation Action Plan for the Barbary macaque (Macaca sylvanus) in Morocco*. High Commission for Water and Forests and the Battle against Desertification, Kingdom of Morocco(2012).
7. Letter of invitation from Mr Derrou, Director of Ifrane National Park Morocco to a meeting in Azrou (January 2013), to discuss development of Barbary macaque focused tourism in Morocco. (Identifier 2)
8. Letter from Ms Els van Lavieren, Director of Moroccan Primate Conservation Foundation, describing our role as consultants and collaborators in the development of anew eco-tourism project, *Monkey Watch*, in Ifrane National Park, Morocco.(Identifier 3)
9. Email and formal letter of invitation from Dr John Cortes, Minister for Health and Environment in the Gibraltar Government, to join the Barbary Macaque Conservation Management Advisory Panel. (Identifier 4)
10. *ABTA's Global Welfare Guidance for Animals in Tourism – Wildlife Viewing*. ABTA (2013).