

Using zoos to protect climate change threatened taxa and to understand species traits for wildlife tourism

Supervised by Prof. Stephen Willis, Department of Biosciences, Durham University, Dr Andrew Moss, Chester Zoo & Dr Mark Whittingham, SNES, Newcastle University.

Background: Modern zoos have multiple objectives including public recreation, education, and aiding ex situ species conservation; the latter being increasingly important. Currently, zoos host collections that combine attracting visitors with conserving threatened species. However, they pay relatively little consideration of species that are likely to become threatened in future. Ongoing and future climate change is one such future threat that will produce new species of conservation concern. Species in the wild is also being impacted by climate, and their protection is increasingly dependent upon wildlife tourism income. However, the drivers of wildlife tourism are poorly understood.

Aims: Here, we propose to address how climate change will impact in situ and ex situ species conservation, and to assess to what extent terrestrial species threatened by climate are overlooked in zoos currently. In addition, we will assess, through both field studies and in zoos, the primary drivers of species attractiveness to visitors in these different environments. Armed with such knowledge, we will produce information on: (a) species of climate threat that are not currently conserved in zoos; (b) the traits of species that make them attractive to wildlife or zoo tourism, and; (c) protected areas globally that are projected to lose wildlife tourism attractor species and identify areas where translocations could benefit long-term conservation goals.



Methodology: Species modelling methods Ongoing work in Durham is predicting future range shifts of birds and mammals globally under climate and land-cover change scenarios, so we already have projections of range changes for birds and mammals (our two focal taxa) under future scenarios. These models will provide the basis for subsequent zoo, field and simulation research.

Zoo-focussed methods We will assess the attraction value of species to zoo visitors using visitor durations at exhibits (in combination with cameras to monitor animals), data collection by the student (plus citizen science data collection), and using people counters to monitor visitor numbers. These data will be used with trait data to understand the drivers of attraction. We already have ecological and physical trait data for most birds & mammals globally.

We will extract species data from a global zoo database, which we will compare to species that are currently threatened, or likely to be threatened in future. We will also explore the typical species assemblages of individual zoos (e.g. proportions of different taxa, easy/difficult to maintain species, functional types, attractive species, species of conservation concern). Using this, we will assess for the first time, the extent to which the world's zoological collections are not protecting species threatened with future changes. We will use complementarity approaches (Margules & Pressey 2000) to simulate collections of species across the world's zoos that would maximise the objectives of public recreation and education and ex situ conservation.

Field-based methods To complement the research above, the student will also spend time at two wildlife tourism hotspots in Africa (Kruger NP, SA & potentially Nairobi NP, KE), during which time they will record visitor stops at wildlife, and relate these to species and their behaviour, traits etc., in a similar manner to the zoo analyses. Such data on visitor preferences could be combined with travel and spend information to simulate future changes to visitors and therefore income streams from wildlife tourism globally.

Timetable of Activities: In year 1, the student will collate trait and range change data, roll-out zoo visitor censuses and collate global zoo collection data. In year 2, they will continue this work and will undertake a first field campaign to study tourism preferences in the field. Year 3 will include a second field campaign, and projecting future changes to wildlife tourism and income, as well as simulating zoo assemblages to cope with future changes.

Maintenance Payment to successful student: £14,700 (approx.) p.a. plus tuition fee for 3.5 years (see <http://www.iapetus.ac.uk/aboutstudentships/> for further details). The project is a CASE studentship with Chester Zoo, which will provide a further £1000 p.a. to the student.

Application Process: The funding is aimed at **UK students**. If you are interested in applying, in the first instance contact Professor Willis (s.g.willis@durham.ac.uk) asap (by 15th Dec at the very latest), with a CV and a covering letter, detailing your reasons for applying for the project. Applicants encouraged to formally apply should do so online via www.durham.ac.uk/postgraduate/apply attaching their CV, covering letter, 2 academic references, and evidence of previous academic qualifications.

CLOSING DATE FOR APPLICANTS: asap - 15th December 2019 latest date to contact Prof Willis. [This post is also advertised on findaphd.com](#)