

Katie Edwards Case Study

If you spot a baby black rhino in a zoo, chances are it's there thanks to the work Dr Katie Edwards carried out during her NERC-funded PhD. Black rhinos in captivity have struggled to produce offspring for many years, leading to a slow decline in numbers of a species that is critically endangered in the wild.



Katie carried out her University of Liverpool NERC-funded PhD in partnership with Dr Susanne Shultz from the University of Manchester and Dr Sue Walker from Chester Zoo, whom together supervised the work at the zoo's wildlife endocrinology lab. This involved the analysis of various breeding pairs of black rhino, at 15 different zoos across Europe.

Katie was at the centre of initially contacting and communicating with the other zoos, then collating and processing the information to identify why the offspring rate was so low – even when the females were of prime reproductive age. She analysed the male and female physiological and biological factors, to determine how captivity was affecting the black rhino's fertility. By being able to track hormones present in rhino dung, she could establish whether the animal had reached puberty, when the optimum time to introduce a male to a female was and whether there were underlying differences between successful and unsuccessful breeders. Before the endocrine project, it was sometimes difficult to see behaviourally when the female would be receptive to a male presence, so introductions were often difficult.

Katie's PhD work was a success – the numbers speak for themselves. Before her research Chester Zoo had not seen a black rhino calf for ten years. Post research, the zoo had welcomed seven calves in as many years into the family! An astonishing impact and an incredible achievement. Katie humbly noted that she was part of a team that worked together to get this result, but the NERC funded research was a major factor in their success.



Sadly, animals in captivity don't always thrive as they would in the wild, and Katie is now applying her PhD research to African and Asian elephants in North American zoos. In 2014, she moved to work at the Smithsonian Conservation Biology Institute in Virginia to work on developing new ways to understand and improve elephants' general health in captivity. This time the information is coming from 70 different zoos and

270 elephants, and again is part of a large collaborative study.

Katie notes key skills that she developed during her NERC funded PhD:

- Developing expertise in an uncommon skill or area of science: In Katie's case this was wildlife endocrinology. Developing this expertise can make you highly sought-after in your future career. Katie has mentored students from across the globe, who visit the lab specially to learn about this area of science.
- Teamwork and collaboration: The ability to work well as a team and collaborate with different groups can greatly improve the research done. Katie explains "In my area of science, if you are unable to collaborate and work well as a team, you do not succeed."

Katie provides some essential advice to anyone interested in pursuing a PhD. "Find something you are passionate about and go for it. Your passion will be invaluable when you hit tough periods, but it will always push you to overcome these times, helping you become a stronger person and a better scientist."

Though analysing rhino dung may not be the most glamorous job in the world, it is an excellent example displaying the importance of bringing academics and science into the world of animal conservation. The conservation work carried out by Katie and her team was a success because of the in-depth scientific knowledge of endocrinology that she studied during her PhD.

Acknowledgement of photos from Chester Zoo©.