

How conservation and animal psychology can work together

October 9 2014



La Hague lighthouse. Credit: Wiki Commons

Researchers are calling for animal cognition experts and conservationists to come together to help animals adapt their behaviour to changing environmental issues and aid their own preservation.

For decades, the lighthouse at Bardsey island in north Wales has shone its sweeping [white light](#) out across the Irish Sea at night, keeping sailors safe. However, the bright beam, which extends 22 miles across the water and is the only light source in the area, has also been implicated in the deaths of thousands of migrating birds who instinctively head towards it and often collide with the lighthouse. On one night in 2003, 40,000 birds

landed on the island. Later this year the white light will be replaced by an intermittent red light in a move wildlife experts say could save large numbers of birds' lives.

Scientists at the Universities of Cambridge and Exeter say this kind of action shows how research on animal behaviour can be used in conservation to mitigate the damage effects of humans on other species. They are calling for closer collaboration between conservationists and animal experts and are building a database to make it easier for conservationists to make use of existing research.

They say that while some animals have shown a remarkable ability to adapt to the impact humans have had on their environment, others have had to put up with the disastrous consequences of life lived in the human shadow. Understanding what drives animals' perceptual and learning systems may significantly improve their outcome. In the case of birds, for instance, studies show changing the colour of the light emitted by a lighthouse makes birds less likely to be attracted to it.

In a recent paper in *Trends in Ecology and Evolution*, specialists in [animal cognition](#), including Professor Nicky Clayton from the University of Cambridge's Department of Psychology, argue that by understanding animals' behaviour, scientists can "purposefully alter" how they respond to their environment in ways that can help preserve them.

They write: "Despite the fundamental connection between cognition and behaviour, the breadth of cognitive theory is under-utilised in conservation practice. Bridging these disciplines could augment existing conservation efforts targeting [animal behaviour](#)."

The paper outlines relevant principles of perception and learning and develops a step-by-step process for applying aspects of cognition towards specific conservation issues. For instance, the authors point out

that animals flee disturbances such as the sound of mine blasts, which wastes energy and feeding time. Through understanding their behaviour and responses, scientists can seek to decrease the extent to which blasts cause avoidance behaviour and help them get used to the noise so that the blasts no longer cause alarm, for instance, by detonating blasts at the same time daily which can make cues more predictable.

The authors conclude: "With shared conservation goals, comparative psychologists can direct their research towards species of conservation concern, and [conservationists](#) can benefit by applying new cognitive insights to difficult problems."

Gates Cambridge Scholar Alison Greggor, lead author on the paper, says: "Animals are inherently guided by cognitive biases that influence which perceptual cues they attend to, and which associations they learn. If we can understand which cues animals use to guide their behaviour, we can target these cues in a specific manner to change their behaviour."

This might not be a case of simply teaching them to adapt to human-dominated environments, although this might be useful in some situations because sometimes the issue is how animals perceive a signal. By changing a signal, such as the lighthouse beam, animals may no longer respond to a stimulus in a negative way.

Greggor, who is doing a PhD in Experimental Psychology, is studying the impact of humans on jackdaws, how their habitat – whether rural or city – makes a difference and whether some birds are more successful when they act in a certain way around humans.

"I'm interested in the interaction between [animals](#) and humans, something that is vital as our influence gets larger and larger," she says. Before starting her work on jackdaws, she worked on the SAPPHIRE project in Hawaii looking at the impact of tourists on dolphin behaviour.

The dolphins came inland to sleep during the day to escape potential dangers from predators. Alison and her colleagues observed their behaviour and were able to recognise individual dolphins and their movements from the marks on their fins. She says that when they are at rest the dolphins tend to move in a tight pack and come up slowly for air. However, the researchers observed that when they were in areas where there was a lot of tourist activity the groups would break up and become agitated. Some would avoid going into the bays altogether. "Their response was a very obvious direct result of human activity day after day. If they don't get enough sleep they are not as vigilant to predators and not as efficient in getting prey. The long-term impact is huge," she says.

Although the fundamental principles of animal cognition have been well studied for decades, it is only within the past 10 years or so that people have begun to see behaviour as something that impacts conservation outcomes.

"In our journal article, we advocate taking things a step farther. Since cognition drives behaviour, we can use our knowledge of cognitive mechanisms to most efficiently shape the [behaviour](#) we want to change," says Greggor. "This has been slowly happening in selected management areas, such as in encouraging hatchery reared-fish to prefer the correct type of stream, or identifying the types of signals that create perceptual errors, but there is a long way to go before the two fields are integrated."

The journal article, published in July, has pushed forward the debate and has already generated discussion, including a formal reply letter and a response from the authors, published this week. Ultimately, however, Greggor says that the theories the authors propose to aid conservation policies need to be made accessible to those forming management policy and conservation programmes.

The Cambridge team, along with international collaborators and Alex Thornton at the University of Exeter, therefore plan to create a database where this type of information is available to those in the conservation field. They are setting up a website based on the example of the Conservation Evidence site run by Professor Bill Sutherland and his colleagues in the Zoology Department (ConservationEvidence.com). This is a free, information resource designed to support decisions about how to maintain and restore global biodiversity through the publication of summarised evidence from scientific literature about the effects of conservation interventions such as species management. Greggor is optimistic the site will turn academic research into [conservation](#) action on the ground. She says: "We are perfectly set up in Cambridge to work together and actually make this happen."

Provided by University of Cambridge

Citation: How conservation and animal psychology can work together (2014, October 9)
retrieved 28 April 2024 from <https://phys.org/news/2014-10-animal-psychology.html>

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