

The identification of endangered species

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In a time of global climate change and rapidly disappearing habitat critical to the survival of countless endangered species, there is a heightened sense of urgency to confirm the return of animals thought to be extinct, or to confirm the presence of newly discovered species. Field biologists traditionally collect specimens to distinguish the animals - or to confirm that they do indeed exist in the wild.

Researchers at Plymouth University and Arizona State University want to change the way biologists think about this "gold standard" of collecting a 'voucher' specimen for [species](#) identification. They suggest that current specimen collection practices may actually pose a risk to vulnerable animal populations already on the brink of extinction.

"We are drawing attention to this issue as an important question bearing on the ethical responsibilities of [field biologists](#). It concerns not only an increased extinction threat to re-discovered species, but also the collection of specimens from small populations more generally," said Ben Minter, an ecological ethicist and conservation scholar in ASU's School of Life Sciences.

"Because these populations are very small and often isolated, they are incredibly sensitive to oversampling," added Minter, also the Arizona Zoological Society Chair. "Combine the understandable impulse to confirm something

really important —such as that a species is not, in fact extinct—with the sensitivity of a population to collection and you've got a potentially significant conservation issue."

The researchers raise the issue in the April 18 issue of the journal *Science*.

In the article, Minter and his colleagues cite examples of the decline or loss of a range of animal species due to the impact of field collections by both professional scientists and amateur naturalists. There are cases of now-extinct birds, as well as the loss and rediscovery of amphibians in Costa Rica.

Changing the "gold standard"

The researchers suggest using a combination of modern, non-lethal techniques to confirm a species' existence including high-resolution photography and audio recordings of sounds or mating calls. Also, using DNA sampling by taking swabs of the mouth or skin offer molecular techniques that could identify an animal without taking a specimen from the field.

The scientists say using new technologies can be just as effective in identifying an organism and will also avoid increasing the extinction risk for small populations.

"The thrill of (re)discovering a species must be one of the most exciting events in a biologist's life, however it is easy to forget it comes with significant responsibilities. What impact are we causing to the species even in this first encounter? The technology is there to gather crucial evidence to substantiate our finding without harming the animals, there is no need to collect by default," said Robert Puschendorf, a conservation biologist who focuses his work on the impacts of disease and climate change on wildlife at the School of Biological Sciences, Plymouth University.

Biology and ethics: balancing ecological impact

against value of research

The discussion about replacing non-lethal identification techniques with less-invasive ones is part of a more complex issue. Weighing the benefits of improved scientific understanding of threatened species for conservation, against the research impacts on [endangered animals](#) is complicated.

"Studying [small populations](#) is a special challenge, especially in cases such as amphibians where species are declining globally, at times to extinction. Our goal is to highlight this challenge while offering options for documenting exciting, interesting, and important discoveries. We are drawing attention to the need for investigators to reflect on the wider ethical and social implications of their work before or as they conduct the research and not just after the fact," said James P. Collins, an evolutionary ecologist and Virginia M. Ullman Professor of Natural History and the Environment in ASU's School of Life Sciences.

Provided by University of Plymouth

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