

Researchers address African vulture poisoning with global disease and biodiversity implications

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African Vultures. Credit: Edwin Remsburg, University of Maryland

University of Maryland (UMD) researchers across multiple colleges collaborated with other international leaders in wildlife conservation to produce an expert assessment and recommendations for vulture poisoning control efforts in Southern Africa. Vultures act as nature's most critical scavengers, working as ecosystem garbage disposals and disinfectors to maintain animal, environmental, and human health alike. With global vulture populations declining, diseases that have previously been under control can potentially reemerge as threats and contribute to the spread of global disease (a top-of-mind issue during the COVID-19 pandemic), while also negatively impacting overall biodiversity.

To address rapidly declining African vulture populations, the National Socio-Environmental Synthesis Center (SESYNC, funded by the National Science Foundation through UMD) has gathered an interdisciplinary and international

group of scientists with the goal of saving Africa's vultures. Findings from their latest publication highlight the issue of illegal vulture poisonings in Southern Africa from a conservation and criminology perspective, recommending a more coordinated and holistic approach to regulation, education, and enforcement to engage local communities and maximize [conservation efforts](#).

"This work is vital," says William Bowerman, chair of Environmental Science and Technology in the College of Agriculture & Natural Resources (AGNR) at UMD and a lead organizer for the SESYNC effort. "We could lose African vultures completely in just a few years. But we have faculty from across UMD and Cornell University, Birdlife International, the Peregrine Fund, Endangered Wildlife Trust, and many others working to solve this international problem collaboratively. We have issues of chemical [poisoning](#), but also lead and other contaminants, [habitat loss](#), poaching and vulture trade for belief and medicinal use, and other factors that contribute to why populations are declining so quickly and why we need so many different experts."

Focusing on vulture poisoning with this new paper published in *Global Ecology and Conservation*, the team at UMD includes faculty members in Environmental Science and Technology, Agricultural and Resource Economics, Anthropology, and a new faculty member in Geographical Sciences (College of Behavioral & Social Sciences, BSOS). Meredith Gore, currently with Michigan State University, is the lead author on this paper and will officially join UMD in August. "I call myself a conservation social scientist—humans are my species, and my habit is to collaborate," says Gore. "When I was invited to work on this SESYNC project, I had no previous exposure to vultures, but I do a lot of work in Africa,

and the human factors in vulture conservation are very complex and dynamic. As a group of experts, we could really leverage our diversity to think about this problem in a different way."

While expert elicitation and "desk assessment" exercises like this paper are common practices in both criminology and conservation, these thought processes had never before been combined and applied in the context of African vulture poisoning to try to make recommendations and ultimately improve control and conservation efforts.

"The use of a criminology framework is relatively new for conservation," says Jen Shaffer, assistant professor in Anthropology, BSOS. "Conservation policies have long focused on identifying direct causes for species loss, culminating in the creation of protected areas for species, as well as policies with incentives and punishments. More recently, there have been efforts to assess and address indirect or underlying causes of species loss, such as poverty, food insecurity, and lack of access to necessary resources. In our research, we captured both direct and indirect causes of African vulture loss, but extended this work to identify a wider range of cultural and physical factors in the environment that promote poisoning. This allowed our group to identify specific tactics that would discourage people from participating in the crime of vulture poisoning."

"We formulated a range of strategies and tactics to prevent poisoning from occurring in the first place, along with limiting the impacts if a poisoning event occurred," adds Jennifer Mullinax, assistant professor in Environmental Science and Technology, AGNR. "For example, we suggested an education campaign on the human health risks from the common poisons used, and a Wildlife Poisoning Response Planning and Training intervention. This effort is a great example of having a large stakeholder group, including local constituents, come up with simple to complex ideas that could be implemented by local agencies or non-profits to directly impact vulture poisoning."

The need for more coordinated education and training efforts was a key finding from the study, since according to Gore, many people, particularly

locals, don't always see poisoning as a crime. Often, this is done to protect livestock from larger animals and predators, with the poison not even intended for vultures. However, intentional poisoning by poachers can also be a factor.

"Bringing vulture population declines from intentional poisoning to light in the scientific community raises a heightened awareness of poaching, not only from the targeted animals (such as elephants) that are killed, but the secondary impact on other species such as vultures, and how all that impacts the socio-ecological-economic health of many peoples and nations," says Reggie Harrell, professor in Environmental Science and Technology, AGNR.

In addition to bringing awareness and recommendations to the scientific community, the information from this paper is already on the ground and in the hands of those who can use it, says Gore, being disseminated by Andre Botha, co-author and Vultures for Africa program manager at the Endangered Wildlife Trust, also a major organizer of the SESYNC initiative. "A key finding from this work is that there are a lot of existing solutions on the ground, they just aren't being combined, coordinated, or used holistically to maximize the benefit. In addition to thinking about ways we can incentivize and enable compliance, for example by restricting access to chemicals being used illegally while still providing access to those who need them for legal reasons, we were able to help identify the places where resources could be implemented first and make recommendations on how to prioritize existing efforts."

Given the complicated nature of vulture poisonings in Africa, combining criminology with community engagement was paramount to this work, Gore adds. "Criminology uses situational crime prevention to prevent terrorist attacks on airplanes and riots in sports stadiums. We used those same situational crime techniques and applied them to vulture conservation. However, we added an additional dimension—engaging communities—based on participatory action research and conservation, which we know and do really well at land grant universities."

Gore and the team emphasize the importance of this information being adapted to local communities and used on the ground for real change. "At the end of the day, we're just experts," says Gore. "That's important, but we look at problems differently than local people do, so the work that we did needs to be interpreted on the ground in a local context."

Shaffer adds, "From an anthropological perspective, I think that our findings underscore how sustainable strategies to reduce and eliminate wildlife crime require local cultural context and community involvement. Our work also serves as a model of how the problem of African vulture poisoning can be addressed elsewhere on the African continent."

"This is a really serious problem," stresses Gore. "Vultures are ecosystem engineers, and as their population decreases, the second order impacts can harm ecosystems and people. It's urgent, dynamic, and also really complex. Why should people in Maryland care about what's happening in Southern Africa? Because it all relates to environmental health. And socio-environmental health relates to socio-environmental security. And global security is national security as the [COVID-19] pandemic has shown us. What starts someplace else impacts us here in the U.S. and in Maryland."

However, Gore and the team are inspired by the collaborative nature of the work, with all team members emphasizing the power of and role of collaborative team science in addressing these major global concerns. "I do think there is a role for scientists to play," says Gore. "We do have something to offer here, and we should be engaging on global issues the way we are through SESYNC."

Lars Olson, professor in Agricultural & Resource Economics, AGNR, adds, "This project is an excellent example of how interdisciplinary team science can produce collaborations that are greater than the sum of the parts and help address the conservation of endangered species subject to multiple threats."

More information: Meredith L. Gore et al, A conservation criminology-based desk assessment of vulture poisoning in the Great Limpopo Transfrontier Conservation Area, *Global Ecology and Conservation* (2020). [DOI: 10.1016/j.gecco.2020.e01076](https://doi.org/10.1016/j.gecco.2020.e01076)

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