LETTERS

Andean condors (*Vultur gryphus*)

Edited by **Jennifer Sills**

Pesticides thwart condor conservation

Despite global conservation crises, widespread and poorly regulated toxic pesticides still cause preventable tragedies. Carbofuran, a carbamate pesticide, is the most implicated globally (*1*). In January, the latest and most shocking known poisoning incident in South America took place in Argentina, where a single Carbofuran-baited sheep carcass set out by ranchers to combat mammalian predators killed 34 Andean condors (*Vultur gryphus*) (*2*), a threatened, emblematic species of the Andes. This incident raised the number of Andean Condors poisoned in Argentina to at least 66 in the past 13 months (*2*). We must take urgent action to prevent future poisoning incidents.

The effect of pesticide poisoning on Andean condor populations is devastating. The global breeding population is estimated at 6700 mature individuals (*3*), including about 300 individuals in northwestern Patagonia (*4*), close to where the latest incident occurred. Barring an immediate stop to the slaughter, this slow-reproducing, long-lived species (*5*) is likely to be doomed to the same fate as the nine critically endangered condors and vultures worldwide (*6*).

Carbofuran should be banned in the developing world just as it is in Canada, the United States, and the European Union (*1*). Other pesticides should be tightly regulated under a comprehensive and binding international treaty such as that recently published by the United Nations (*7*). Such regulation should ensure monitoring of the pesticide's manufacturing process and its use by consumers, leading to a more responsible, less environmentally harmful use of agrochemicals. This would end the double standards whereby developing countries with weaker regulatory enforcement bear the brunt of mass poisonings, putting both wildlife and human health at risk (*1*, *8*). Legislation and enforcement must go hand in hand with a national commitment to mitigate the underlying causes of poisoning. We recommend strengthening research, environmental education, and collaboration among researchers, managers, and farmers to reduce carnivore-scavenger-livestock conflicts and promote sustainable coexistence among productive human activities and wildlife conservation.

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Europe's uneven laws threaten scavengers

In 2000, the European Union put sanitary policies into effect to prevent outbreaks of bovine spongiform encephalopathy (*1*, *2*). These policies dictated the removal of carcasses, which in turn threatened the conservation of carrion-eating birds such as vultures, eagles, and kites, as well as carnivorous mammals such as wolves and bears (*1*, *3*). After a long process, biodiversity conservation and public health initiatives have been integrated into a new policy that considers the natural foraging patterns of scavengers when allowing farmers to leave livestock carcasses in the field (*2*, *4*). However, the conservation objectives of this legislation now face a new threat: the lack of consistent criteria to designate scavenger feeding zones (SFZs), where fallen livestock can be left uncollected (*4*).

According to EU legislation, competent authorities can designate SFZs in areas with extensive farming—provided they meet certain sanitary requirements (*4*). However, SFZ policy in EU Member States varies. Bulgaria and Portugal have no SFZs (*5*, *6*), and France has only a few (*7*), whereas Spain has designated large areas and added additional criteria through national and subnational laws (*8*). Consequently, criteria for designating SFZs vary across Spanish autonomous regions. For instance, in Comunidad Valenciana, only Natura 2000 protected areas were selected for SFZ designation (*9*), whereas in La Rioja, scavenger foraging areas in mountain ranges are also considered (*10*). Inconsistent criteria will likely lead to carrion food shortages in some areas. This may alter scavenger foraging behaviors, with detrimental socioeconomic and ecological consequences (*11*).

To successfully integrate environmental concerns into the policies across Europe, the European Union should prioritize uniform criteria for SFZs. We recommend designating SFZs that encompass the large foraging ranges of vultures, which would also include the smaller ranges of other scavengers, such as territorial raptors and large carnivores. EU sanitary regulations have been amended seven times in 10 years, and two Spanish autonomous regions have already expanded initially designated SFZs (*9*, *10*). Establishing large, effective areas for all scavengers (while observing sanitary restrictions) will prevent the need for subsequent legal amendments. Europe's "better regulation" agenda encourages the constant assessment and improvement of EU legislation (*12*), and this goal cannot be met without enforcing a uniform designation of SFZs.

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Kayaks in Alaska's Glacier Bay

PHOTO: SARAH BISBING

LIFE IN SCIENCE

The hidden value of paper records

We are wandering on foot in the forests of Glacier Bay, Alaska, in a steady rain, searching for a tree that is visible in a decades-old photograph. The willows form a green wall as we push through, soaking wet despite our full rubber raingear. We are attempting to rediscover the exact location of what would be—if found—the longest running data set of its kind in the world, established a century ago.

In 1916, Dr. William Cooper began collecting data about individual plant establishment, growth, and death in a specific location, and he returned every 5 to 10 years to the exact spot to create a longitudinal record. The data set is unique given its age and continuity, and it has provided incredible insights to the fields of biology and ecology. However, the plot location was lost and the observation chain broken after Cooper and later his student, Lawrence, died.

The prospect of finding the plot was bleak; the landscape is difficult to navigate, requiring kayaking and scrambling out of radio contact while dealing with thick vegetation, bears, wolves, and the famously bad weather of southeast Alaska. But we had stumbled upon a clue: a faded old photograph taken 50 years ago. Noted on it was a tree we could match up with our 2016 view. The original researchers likely hadn't realized the photograph's future value. It had never been published or intentionally preserved. A similar study conducted in 2018, with the use of iPhone photographs and email, would likely leave future researchers with no such artifacts.

After days of searching, we finally arrive with elation at the tree. With a metal detector, we search the area for the iron rods, now buried, that mark each plot. To our amazement, we relocate every one of the original plots. Our seemingly quixotic journey has ended in success. One casually snapped photo has helped reestablish a long-lost source of invaluable data. Our experience has made us realize the potential value of physical records. When researchers tramp through Glacier Bay in 2118, keeping the plots alive, I hope they can use our photos and notes for something new, something we can't anticipate. I just hope they get better weather.

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ERRATA

Erratum for the Report "Translocation of a gut pathobiont drives autoimmunity in mice and humans" by S. Manfredo Vieira *et al.*, *Science* **360**, eaat9922 (2018). Published online 4 May 2018; 10.1126/science.aat9922

Erratum for the Report "A precise measurement of the magnetic field in the corona of the black hole binary V404 Cygni" by Y. Dallilar *et al.*, *Science* **360**, eaat9270 (2018). Published online 20 April 2018; 10.1126/science.aat9270

Erratum for the Report "Predicting reaction performance in C–N cross-coupling using machine learning" by D. T. Ahneman *et al.*, *Science* **360**, eaat7648 (2018). Published online 13 April 2018; 10.1126/science.aat7648

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