Podcast Interview: Myra Finkelstein

PNAS: I’m your host Sandeep Ravindran, and welcome back to Science Sessions. North America’s largest bird, the California condor, was driven nearly to extinction by 1982, when only 22 condors remained worldwide. Intensive captive breeding and management efforts helped condor populations increase to nearly 400 by the end of 2010, with about half of those in the wild. But in a recent PNAS study, UC Santa Cruz researcher Myra Finkelstein and her colleagues found that condors in California remain chronically exposed to harmful levels of lead, threatening the recovery of this critically endangered species. The researchers used isotopic analysis to confirm that lead-based ammunition was the main source of the lead, and concluded that condor populations are likely to decline again without current levels of intensive management. Finkelstein discussed her findings with PNAS over the phone, and starts by describing the basis for the study.

Finkelstein: People have known that condors have died of lead poisoning for many, many years, but the extent of the lead poisoning rates wasn’t well known, and we realized that it was important to produce or to conduct a comprehensive study so we could get sort of a big picture overall view of what the California condor’s recovery status was in California and what were the limitations.

PNAS: What did you find?

Finkelstein: We looked at two different ways to assess the lead poisoning rates or exposure in California condors. We looked at blood lead levels, so we looked at about 1500 blood lead levels collected from California condors in California. In addition to that we looked at growing feathers of California condors, and get the lead exposure history over the time-frame of feather growth. One of the things we found are that California condors are continually exposed to harmful levels of lead, and that the principle source of that lead is lead-based ammunition, and that lead poisoning from ammunition is preventing the recovery of the California condor population in California. We knew that lead poisoning was a big problem for condors, but we were surprised by the magnitude of the poisoning. It’s of vast epidemic proportions. So almost half the free-flying population in California has had blood lead levels high enough to indicate that they were clinically poisoned, and also that they would need clinical treatments for this lead poisoning. The main effect that we know of for California condors is death. Lead poisoning is the primary cause of mortality for juvenile and adult California condors in California.

PNAS: How do the condors become exposed to lead?

Finkelstein: Well, California condors are scavengers, and so when they feed on dead animals, they can inadvertently ingest lead ammunition fragments as they’re also eating their meal. You know, condors consume between 75 and 150 carcasses every year, which we feel is an accurate, sort of, estimate, we found that even if fewer than 2% of the carcasses out there in the landscape contain lead, there is a 50% chance that a condor will eat carcasses or remains of animals shot with lead-based ammunition. And even a
couple of, like, very small fragments, equivalent to just a couple of grains of sand of lead ammunition, has enough lead to poison and potentially kill a condor.

**PNAS:** Environmental lead can affect more than just condors, Finkelstein says.

**Finkelstein:** Our study showed, I think, pretty clearly that we need to reduce the amount of lead out there in the environment that the condors are being exposed to. And California condors are not the only species that’s impacted by lead poisoning. Golden eagles are affected, bald eagles are affected, pretty much any species that scavenges has the potential to be exposed to lead-based ammunition within carcasses. This is potentially also a human health problem. The fact that we’re putting so much lead into the environment that can be inadvertently ingested by wildlife or, you know, potentially humans if they’re eating meat that has been shot with lead-based ammunition...there’s a huge amount of scientific evidence that even a very small amount of lead exposure to a young child is harmful. And so, not only is this an issue for wildlife, it is an issue potentially for human health.

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