

What's still threatening coastal California condors?

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California condor . Credit: San Diego State University

A portrait of a California condor, one of the world's largest flying birds, hangs opposite the desk of Nathan Dodder. The image is a constant reminder of the threatened bird that the San Diego State University analytical chemist is working to help save.

Along with SDSU environmental scientist Eunha Hoh and colleagues at

the San Diego Zoo, Dodder recently received funding to study environmental toxins found along the coast that could impact the [condor](#)'s reproductive success.

The California condor (*Gymnogyps californianus*) is one of the most famous success stories in species conservation. By the late 1980s, condors' eggshells had become dangerously thin, owing largely to human-caused factors. The agricultural pesticide DDT—now banned, but used widely for decades—as well as condors consuming animals that had been shot with lead pellets were leading causes for eggshell thinning. Once a common sight over California skies, the number of wild condors remaining dropped to just 22 in 1987.

That same year, a federally sponsored conservation program rounded up the remaining condors and began a captive breeding program headquartered San Diego Wild Animal Park (today known as the Safari Park) and the Los Angeles Zoo. As the condors bred, some were reintroduced into the wild. Most were released in California and Arizona, and a few were eventually released in Baja California, Mexico. Today, their numbers have rebounded to more than 440 known California condors in the wild or living in captivity.

In recent years, however, conservationists noticed a worrying trend: Condors living in coastal environments, such as near Big Sur, California, had fewer successful egg hatchings than condors living further inland.

"As many as 40 percent coastal-living California condor breeding pairs showed evidence of eggshell thinning," Dodder explained.

Researchers have hypothesized that the coastal condors' diet might partly explain why.

California condors are scavengers that primarily subsist on carrion, the

decaying flesh of dead animals. For coastal condors, that means a large part of their diet is made up of dead marine mammals—sea lions, dolphins and seals, for examples—that wash ashore.

Because California's coastal waters are a hot bed of environmental toxicity due to industrial runoff and wastewater and storm water discharge, these toxins build up in the food web and become concentrated in top predators like marine mammals. If the condors are ingesting dangerous, concentrated levels of environmental toxins in coastal carrion, researchers worry it could be the reason why coastal condors' eggshells are thinner and their reproductive success is lower.

To find out whether that's the case, Dodder and Hoh, along with San Diego Zoo conservationists Christopher Tubbs and Ignacio Vilchis are scanning the chemical compositions of dead marine mammals found up and down the California and Baja California coasts, looking specifically for high concentrations of contaminants known to be toxic. They will then compare those results to chemical analyses of blood sampled from dozens of California condors living in both inland and coastal environments, looking for tell-tale matches.

"We're zeroing in on fewer than a dozen highly concentrated contaminants that are abundant in both marine mammals and condors," Dodder said.

Early results point to one potential toxic troublemaker: a compound known as tris (4-chlorophenyl) methanol, or TCPM, that has been found in high concentrations in both [marine mammal](#) carcasses and condors. More research will be needed to determine whether TCPM is indeed playing a harmful role in condor reproduction, as well as what other contaminants might be involved.

The research is funded by a two-year, \$257,000 grant from California

Sea Grant, a program of the National Oceanic and Atmospheric Administration. The funding will also support training and research experience for an SDSU graduate student.

In addition to simply identifying harmful coastal contaminants that may be holding back California condor conservation efforts, researchers are also interested in whether Baja California should receive an increased share of the reintroduced condors. Less industrial hunting and agriculture occurs on the peninsula, explained Hoh, meaning condors there are probably exposed to less lead and pesticides.

"But because marine mammals migrate up and down the coast, a big unknown is whether the toxicity of marine mammals would be the same in Baja California as it is along the California coast, negating the other benefits," Hoh said.

Provided by San Diego State University

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