

Scientists wondering why condors on the California coast were having trouble reproducing have found the culprit: a pesticide they ingest when eating sea lions.

[SAN FRANCISCO](#) — In the coastal redwood forests of central California, scientists trying to unravel the mystery surrounding the reproductive problems of dozens of endangered condors think they have uncovered the culprit: the long-banned pesticide DDT. The soaring scavengers with wingspans wider than NBA players are tall were reintroduced to the rugged coast of Big Sur in 1997 after a century long absence. Upon arrival, the birds found plenty to eat, with dead California sea lions and other marine mammals littering the craggy shoreline.

While a good food source, sea lion blubber often has high levels of DDT, a pesticide banned in 1972 that has proven to be a persistent pollutant because it accumulates in bodies of creatures throughout the food chain when animals eat one another. Once used widely in agriculture, DDT was banned because it is a human toxin considered a possible carcinogen by the U.S. Centers for Disease Control and Prevention.

Kelly Sorenson, executive director of Ventana Wildlife Society and a co-author of a new study on condors, said researchers who spent six years studying their reproductive problems have "established a strong link" to DDT in the birds' food source. The peer-reviewed paper written by 10 condor experts, including biologists from the Los Angeles and Santa Barbara zoos and the U.S. Fish and Wildlife Service, is being published this month in the University of California journal *The Condor*.

"In science, rarely is anything definitive, but we've established a strong link between ... DDT and eggshell thinning in California condors," Sorenson told the Associated Press. The eggshell mystery began in 2006, when a biologist inspecting a condor nest in the cavity of a redwood tree on the central California coast found the first thin shell.

Over the next six years, the scientists observed condors feeding on dozens of sea lions, and found that the Big Sur condor population had a low hatching success — just 20-40 percent — for 16 nesting pairs. In contrast, 70-80 percent of southern California condors in the Tejon area had hatched successfully over the same time. The southern California condors are inland, and sea lions are not a food source.

Biologists familiar with the ravages of DDT in bird populations immediately suspected the widely used pesticide as a factor. Tests since the 1970s have found high levels of DDT in sea lions; and studies have linked DDT's metabolized version, DDE, to egg shell thinning in birds, including brown pelicans and bald eagles.

The condor study attributed at least eight of 16 egg failures to thinning from DDT. One shell found crushed in a nest was 54-percent thinner than normal. Thinning can also allow bacteria to more easily enter the eggs. But why did the sea lions have such high DDT levels in the first place?

The scientists theorize that the sea mammals were exposed when they migrated to the central coast from southern California, where the Montrose Chemical Corp. dumped DDT with impunity

for decades until the 1970s. The Montrose plant and the ocean off Palos Verdes where it dumped DDT are now listed as Environmental Protection Agency "Superfund" sites.

"A vast majority of California sea lions have spent at least a portion of their lives in the waters of southern California, which is the most DDT-contaminated coastal environment in the world," Sorenson said. "Northward movements of sea lions provide a pathway of DDT to condors in central California."

The study's authors and other experts agree that lead ammunition, not DDT, is the main threat to the survivability of condors. But Jesse Grantham, a former condor program coordinator for Fish and Wildlife who did not participate in the study, called the paper's findings helpful scientific evidence that will add to the overall picture of threats facing condor recovery.

Another former condor program manager, Noel Snyder, was critical of the DDT study, however. He said it only looks closely at one potential cause of reproductive problems — DDT — and fails to properly evaluate the potential effects of other contaminants and factors that may be involved and more important.

"DDT is not the only thing that causes eggshell thinning, and the authors of the paper don't present a significant correlation of DDT with the thinning found, and thus do not do a convincing job of linking DDT with the happenings in Big Sur." Study author and Ventana wildlife biologist Joe Burnett defended the team's work, saying all data pointed to the pesticide as the problem.

"We collected data on many different environmental toxins but none, other than DDE, were even in the ballpark known to cause reproductive failure in birds," Burnett said. In the final analysis, the study's authors say the DDT problem will fade over time. "Like bald eagles and other bird species previously affected by DDT, the thickness of condor eggshells should recover as contamination declines in the coastal environment," said co-author Robert Risebrough, an expert on the effects of DDT on birds.