

Struggling California condor population suggests persistence of DDT

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Recent reports and studies of a struggling California condor population indicate the persistence of DDT contamination, underscoring long-standing concerns that the chemical pesticide and its related byproduct chemicals continue to threaten animal life and affect human health.

California condors (*Gymnogyps californianus*) have long been a symbol of species conservation efforts. The largest birds in North America, California condors were pulled from the brink of extinction in the 1980s, to great media fanfare. The breed's wild population is once again struggling, however, and DDT may be the culprit.

The California condor's habitat once extended throughout the western and southern parts of North America, from British Columbia to Baja California, including Arizona, New Mexico, Texas, and Florida. It now inhabits only a small U-shaped area in Southern California, in parts of Arizona and in Baja California. In addition to dichlorodiphenyltrichloroethane (DDT) contamination, the condor population was depleted by accidental shootings, habitat loss and lead poisoning.

Because of the continued decline of the bird population even after habitat protections were put in place, the decision was made to capture all remaining wild condors in 1986. In 1987 the last wild condor was caught to breed in captivity. After a bad start with reintroducing the birds into the wild in 1992, they were recaptured and captivity methods were revised. The birds were successfully reintroduced in 1995, but repopulation has been slow. It takes six to eight years for the condor to reach sexual maturity and mating pairs may lay only one egg every two years.

Four years ago, under the supervision of Joe Burnett, a senior wildlife biologist with the Ventana Wildlife Society and the lead biologist for the California Condor

Recovery Program, two California condors made the first attempt in a century to successfully nest in the wild. But when this attempt failed, biologists examined the nest and found that the eggshell fragments were so thin they did not even resemble a condor egg.

Burnett knew that this could be caused by DDT, which by inhibiting the delivery of calcium makes eggshells so thin that the parent birds accidentally crush the egg while caring for it. Ventana Wildlife Society biologists searched out other condor nests in Big Sur and replaced their weak-shelled eggs with those laid in the captive-breeding programs.

By comparing inland condors with coastal condors, biologists found that the former was laying normal and healthy eggs. Condors live off of large dead animals and can eat up to four pounds of meat at a time when they find carcasses. Inland condors feed off of deer, antelope, elk, domestic cows and other large game carcasses, while coastal condors eat dead marine life.

Burnett believes that DDT may have entered the condors through their consumption of sea lion carcasses. There had not been any known source of DDT contamination at Big Sur, but Burnett looked to the breeding grounds of California sea lions, on the coast of Palos Verdes. Hundreds of sea lions use the coast near Big Sur as a rest stop, and it has become the coastal condors' favorite feeding ground.

Biologists have discovered that because of the low-water solubility and high fat solubility, high concentrations of DDT and DDE, a potent byproduct of the metabolic breakdown of DDT, are found in the blubber of the sea lions. DDT is highly resistant to metabolic breakdown. It has a half life of six years, while DDE's half life is up to ten years.

Half a century ago Montrose Chemical Corporation in Palos Verdes was the world's largest producer of

DDT, which had been first used to control the spread of malaria and typhus during WWII. According to the Environmental Protection Agency's (EPA) remedial project manager for Palos Verdes, the company discharged untreated DDT waste directly into the Los Angeles County Sanitation District's sewer system in the 1950s and 60s. About 1,700 tons of it settled onto the seabed. This is the largest known DDT contamination site, 17 square miles in all.

In late 2000, the US Justice Department and California Attorney General announced the settlement of a lawsuit against Montrose and three other companies, allocating \$43 million dollars to the cleanup of the seabed and \$30 million to the restoration of natural resources. From earlier settlements there was a total of \$140 million for the use of cleaning, according to the EPA. Arguing against the initial lawsuit, which was filed in 1990, the polluting companies argued that DDT was not responsible for harming animals, and that, in any case, the natural circulation of the ocean would clean the contamination on its own. Scientists have countered that this level of DDT will not break down for a hundred years at least.

The EPA designated the area a Superfund non-time critical removal action in 1996 (a non-urgent clean-up order) to assess the ecological and human health risks. A program instituted in 2000, coordinated by EPA remedial project manager Carmen White, will cap the seabed with sand and silt in 2012. A pilot study was done in 2000, where the EPA capped 1 percent of the contaminated seabed with clean soil. Other suggestions offered by the EPA include leaving the sediment as it is and simply posting warnings about the consumption of fish.

This marine Superfund site is not the only source of continuing DDT contamination in the area. A 2004 study published by the National Oceanic and Atmospheric Administration (NOAA) shows that waters only 30 miles north of Big Sur continue to be contaminated with DDT through runoff of sediment from terrestrial canyon sites. Condor eggs are one visibly alarming indication of the prevalence of the toxic chemical. The report notes that DDT's "effect on the deep ocean benthic community is unknown."

Marine biologist Rachel Carson established the toxic effects of DDT in her 1962 book *Silent Spring*. A ban on the use of DDT in agriculture was put in place

nearly a decade later. The known health risks for humans include disorders of the endocrine system and major reproductive problems, in addition to low birth weight and poor lactation.

Decades after its curtailment for pest control, DDT persists in the US even in human bodies—even in newborns. The Environmental Working Group, in a 2005 study on umbilical cord blood in newborns, found the chemical to be widespread.

Heavy use of DDT continues in poor countries, despite the established health risks and the resistance to DDT that the *Anopheles* mosquito has evolved. The pesticide is used widely in subtropical regions such as India and sub-Saharan Africa to combat malaria inside homes and on surrounding farmlands. More effective pesticides are more expensive, and though scientists believe it is realizable, no vaccine has yet been developed for malaria, which affects roughly 250 million people yearly.

The authors also recommend:

Study finds hundred of toxic chemicals in umbilical cords of newborns

[7 December 2005]

Malaria's appalling death toll in sub-Saharan Africa

[14 May 2003]

Further evidence that chemical crop sprays cause adverse health effects

[17 April 1999]



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