

# High Country News

Know the West

## The power and plight of the parasite

[Marian Lyman Kirst](#) May 29, 2012



According to an April 30<sup>th</sup> census, the number of California condors—one of the largest and most endangered birds in the world—has reached 405 (both wild and captive). That's the most condors to exist on the planet since recovery of the species began in the 1980's when only 23 remained, [reports the \*Oregonian\*](#). Continuing threats to the birds, particularly lead poisoning—to which the condors succumb after ingesting carrion peppered with the shards of exploded lead bullets—prompted the U.S. Fish and Wildlife Service to capture the remaining birds in 1987 and place them in a handful of captive breeding programs around the West ([HCN, 03/05/07, "Get the lead out"](#)).

As the April census indicates, the recovery programs have been a great success, pulling the magnificent bald-headed birds—which sport wingspans of nearly 10 feet and which can live for more than 60 years—from the brink of extinction. But in the process, another, somewhat less charismatic creature, has been wiped out: *Colpocephalum californici*, an avian chewing louse that lived only on the California condor.

“As far as scientists can tell, based on very limited knowledge, *C. californici* caused its condor hosts no harm. The bird was simply a mobile home, providing shelter and the occasional feather meal,” [reports the San Diego Union-Tribune](#). The louse was one of an estimated 6,300 known “affiliate species”—pollinators, parasites and mutualists (a species that carries on a mutually-beneficial relationship with another species) that are uniquely adapted to the species on which they depend. Because of the intimate relationships affiliate species share with their hosts, they can tell us a great deal about the biology of the hosts themselves, which can prove especially handy when the host species is rare or endangered.



But when the Service rounded up the world’s remaining condors in 1987 and sent them to recovery and breeding centers, the birds were treated for parasites and, [as \*SEED Magazine\* eloquently describes](#), “the last *C. californici* vanished from the Earth in a puff of carbaryl-powder fumigation.”

The lice’s disappearance—the result of negligence rather than deliberate extermination—is an example of “coextinction”, a term coined in the early 2000's to refer to species that go extinct because the creatures on which they depend have become very rare or have vanished entirely. [A 2004 study](#) found that, in the last 200 years, at least 100 species of butterflies, beetles and lice have disappeared as a result of coextinction. Indeed, in a 2005 article in [Conservation Biology about modern insect extinctions](#), zoologist and author Rob Dunn says that, given the number of species recommended for captive breeding programs—which, through fumigation or disinfection, can wipe out parasitic or mutualistic affiliates (like the condor louse)—hundreds of affiliate species could be lost. “The potential magnitude of coextinctions should make them a key focus of conservation biology, yet the process of coextinction has been little studied,” Dunn says.

And while the annihilation of tiny, blood-sucking parasites and itty-bitty invertebrates may seem like a trifle (or even a plus), studies suggest that the extinction of affiliate species such as parasites is a blow, not a boon, to science. Affiliate species like ticks, mites and lice are “great repositories of history, living chronicles of how organisms evolve over time,” says the [Union-Tribune](#). Because parasites reproduce faster, evolve more quickly, are much more abundant, and have more genetic diversity than their imperiled hosts, they can often teach us more about those hosts than can the hosts themselves (which are often too scarce or fragile to study in detail).  
From *SEED*:

If researchers know enough about the parasites and how they move from host to host, the parasites’ genes can be used as proxies for the hosts’ or show interaction between populations that did not result in reproduction.



Indeed, biologists from the University of Utah used “whale lice”, small parasitic crustaceans that feed off flaking whale skin, to suss out the evolutionary history of the endangered right whale. The feline immunodeficiency virus (a pathogen, not a parasite) has helped reveal the movements and demographics of isolated cougar populations in the northern Rocky Mountains. And scientists studying the Galapagos hawk, an endangered raptor endemic to the eastern Pacific islands that Darwin made famous, looked to the bird’s feather lice to figure out how and when the birds colonized the islands and how each population is related.

The lice’s mitochondrial DNA, for example, is more variable than that of the parasite’s feathered host, a circumstance that allowed scientists to put together the feather lice’s family tree and reveal the relationships of four of the hawk's eight populations -- “the stepping-stone manner in which, over time, the hawks colonized first one island, then another and another, carrying their lice as they went,” [reports ScienceDaily](#). These relationships were previously hard to untangle due to the imperiled hawk's limited genetic variation.

So when California condor populations finally top 450 birds, the number required before the species can officially be considered for downlisting under the ESA, by all means celebrate. But don't forget to raise a glass to the little lice that once lived on the great bird and to all the parasites, pathogens and symbionts threatened by coextinction, the neglected creatures that may just be as worthy of conservation as the hosts themselves.

*Marian Lyman Kirst is an editorial fellow for High Country News*

*Images courtesy the National Park Service, photobucket user [nutmeg66](#), and flickr user [MyFWCResearch](#).*

[Republish](#) [Like](#) [Tweet](#) [Email](#) [Print](#)

Copyright © High Country News