

BLOOD-LEAD CONCENTRATIONS IN CALIFORNIA CONDORS RELEASED AT PINNACLES NATIONAL MONUMENT, CALIFORNIA

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ABSTRACT.—Twenty-four California Condors (*Gymnogyps californianus*) were released at Pinnacles National Monument, California between December 2003 and August 2007 as part of a larger program to recover the endangered species to the wild. We collected 63 independent, post-release blood samples from 20 individuals and analyzed their lead concentration patterns. Of the 20 individuals, we collected pre-release samples on nine to compare blood lead values before and after release. Of the 63 post-release samples, 24 (38.1%) were above background (20–59 µg/dL), two (3.2%) were clinically affected (60–99 µg/dL), and two more (3.2%) were indicative of acute toxicity (≥ 100 µg/dL). Fifteen (75.0%) of individuals sampled were exposed at least once and eight (40.0%) were exposed on two or more occasions. We found a significant difference comparing samples collected before release and within one year after release from the same individuals, revealing that even young, inexperienced condors in this area are vulnerable to lead exposure. We show a lack of seasonal and annual trends of lead exposure to condors in this area and discuss possible explanations. Observations were made of free-flying condors feeding on ground squirrels, feral pigs, cattle, and marine mammals, suggesting it is plausible that elevated blood lead levels resulted, in part, due to inadvertent ingestion of spent lead ammunition. Convinced that lead ammunition is the primary source of exposure to condors, California lawmakers and the California Fish and Game Commission adopted a lead ammunition ban within the range of the condor in California beginning on July 1, 2008. Reducing lead exposure in the long-run will largely depend on hunters' willingness to switch to non-lead alternatives and studies such as this one should be continued into the foreseeable future to monitor the extent and effect of hunter compliance.

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