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# **Ingestion of Lead from Spent Ammunition:**

Implications for Wildlife  
and Humans

## **Proceedings of the Conference**

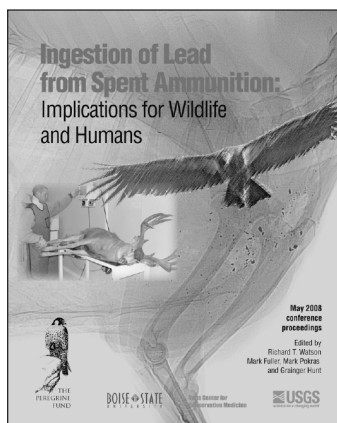
Ingestion of Spent Lead Ammunition:  
Implications for Wildlife and Humans

12-15 May 2008, Boise State University,  
Idaho, United States of America

## **Editors**

Richard T. Watson  
Mark Fuller, Mark Pokras  
and Grainger Hunt

## Cover Images



Front Cover, inset: A biologist radiographs a hunter-killed deer to count lead fragments and measure their dispersion from the bullet path. *Kathy Sullivan/Arizona Game and Fish Department.*

Background: Radiograph of bullet fragments in hunter-killed deer. *Oliver Krone/Leibniz-Institute for Zoo and Wildlife Research.*

Foreground: California Condors foraging on hunter-killed game are annually exposed to lead from spent ammunition. Fatal exposure levels occur often enough to prevent recovery of this critically endangered species.



Back cover, clockwise from upper left:

A display features non-lead ammunition along with information for hunters at a sporting goods store in Arizona. *George Andrejko/Arizona Game and Fish Department.*

Lead bullets (left) are more likely to fragment and lose mass than solid copper bullets (right). *Chris Parish/The Peregrine Fund.*

Color encoded 3D reconstruction of CT scan data showing 20 packages of ground venison in red and metal fragments in white. The streak artifacts associated with the largest metal fragments in the dataset are a phenomenon common to larger metal objects in clinical CT imaging. *Edward Fogarty.*

A biologist massages the abdomen of a lead poisoned Trumpeter Swan to speed the passage of lead particles through the gastrointestinal tract to reduce lead absorption, while keeping the bird calm to reduce stress. *Raptor Education Group, Inc.*

White-tailed Sea Eagles feed on a carcass in Germany. *Oliver Krone/Leibniz-Institute for Zoo and Wildlife Research.*

Biologists collect a blood sample for lead analysis from a California Condor. *Arizona Game and Fish Department.*

Many Alaskans rely on gun-harvested wild game for a significant part of their total diet. *Susan Georgette/US Fish and Wildlife Service*

Upland game birds, including doves shown here, are commonly hunted with lead shot in the US. *Missouri Department of Conservation.*

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**Conference Summary**

Summary of the Main Findings and Conclusions of the Conference  
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