

RISK ASSESSMENT OF LEAD POISONING IN RAPTORS CAUSED BY RECREATIONAL SHOOTING OF PRAIRIE DOGS

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EXTENDED ABSTRACT.—Recreational shooting of Black-tailed Prairie Dogs (*Cynomys ludovicianus*) is a common activity at Thunder Basin National Grassland (TBNG), Wyoming where annual use by prairie dog shooters can be as high as 8,500 shooter-use-days. The prairie dog carcasses left in the area are scavenged by raptors and other animals susceptible to lead (Pb) poisoning if they consume Pb bullet fragments or Pb shot. In 2000, a local rehabilitator noted an increase of Pb poisoning cases in raptors from the area. We collected 22 shooter-killed prairie dog carcasses from TBNG in 2001 to determine if Pb fragments remained embedded in the tissue that potentially would be consumed by raptors. Radiographs of 19 of the 22 prairie dog carcasses showed fragments consistent with Pb.

In 2002, we conducted a more in-depth study to determine if Pb poisoning was occurring in raptors at TBNG by documenting the number of raptors on prairie dogs at colonies where shooting occurred, assaying bullet fragments in shot prairie dogs to determine Pb content, and analyzing blood and feather samples of Ferruginous Hawk (*Buteo regalis*) and Golden Eagle (*Aquila chrysaetos*) nestlings and feathers from Burrowing Owls (*Athene cunicularia*) for clinical signs of Pb poisoning. We observed raptors foraging at prairie dog colonies and collected data on the number of shooters at prairie dog colonies. Shooter intensity did not predict raptor use when compared to a site near Rawlins, Wyoming where shooting did not occur.

We detected metal fragments in 4 of 10 shot prairie dog carcasses collected. The total weight of the fragments found in each carcass ranged from 10 – 146 mg. Copper was the primary metal detected in three of four carcasses; but, significant amounts of Pb were found in the three carcasses. These fragments contained an average of 11.5 mg Pb and weighed an average of 24.7 mg with copper presumably making up the difference. Fragments <25 mg are considered small enough to be ingested and pose a risk of Pb absorption (Pauli and Buskirk 2007). Blood Pb concentrations in Ferruginous Hawk nestlings were below sub-clinical levels at TBNG and the control site. Analysis of red blood cell delta-aminolevulinic acid dehydratase activity, hemoglobin levels, and protoporphyrin levels also did not indicate Pb poisoning in Ferruginous Hawk nestlings. Additionally, blood and feather samples from Golden Eagle nestlings and feather samples from Burrowing Owls (juveniles and adults) at TBNG did not indicate Pb poisoning.

There are several possible reasons why Pb levels we found in Ferruginous Hawks and Golden Eagles (and possibly Burrowing Owls) that scavenge on the carcasses of shot prairie dogs were low. First, a sylvatic plague (*Yersinia pestis*) epizootic drastically reduced prairie dog numbers at many of the colonies in TBNG during 2001–2002. Second, 13% of TBNG was closed in 2001 to prairie dog shooting in an effort to reintroduce Black-footed Ferrets (*Mustela nigripes*). New shooting regulations and a

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dwindling prairie dog population reduced the number of shooters that visited TBNG during the course of our study relative to previous years. Finally, long-term surveys in this area indicate that lagomorphs were abundant during our study, reducing the likelihood of raptors scavenging shot prairie

dogs. Further study is needed to determine if the occurrence of Pb poisoning in TBNG relates to prairie dog and raptor abundance, availability of alternate food sources, and regulations on shooting. Received 30 May 2008, accepted 22 October 2008.

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