

The Continental-Scale Implications of Point Source Lead Exposure in Golden Eagles

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Lead poisoning threatens many species of raptors, including golden eagles (*Aquila chrysaetos*). Much of this lead likely comes from bullet fragments that remain in carrion after hunting. The likelihood of lead exposure in golden eagles may peak when migratory and nonmigratory birds congregate in the fall and winter. From 2011 to 2018 in western Montana, we captured 91 golden eagles in the winter, tested their blood lead levels (BLL), and outfitted a subset of birds ($n = 30$) with GPS transmitters to determine their migratory status. Nearly all golden eagles (94.5%) had elevated BLL ($Y=10 \hat{I}^{1/4}g \text{ dL}^{-1}$), and eight of them had BLL at or above concentrations expected to cause clinical lead poisoning. Blood lead levels decreased as the winter progressed because hatch-year and juvenile birds tended to have lower BLL later in the season. At least two-thirds of the golden eagles equipped with GPS transmitters migrated northward, spending the summer throughout Alaska and northwestern Canada. Blood lead levels did not differ between migratory and nonmigratory golden eagles. Overall, we show that elevated BLL are widespread among golden eagles overwintering in western Montana, regardless of sex, age, and whether they migrate.