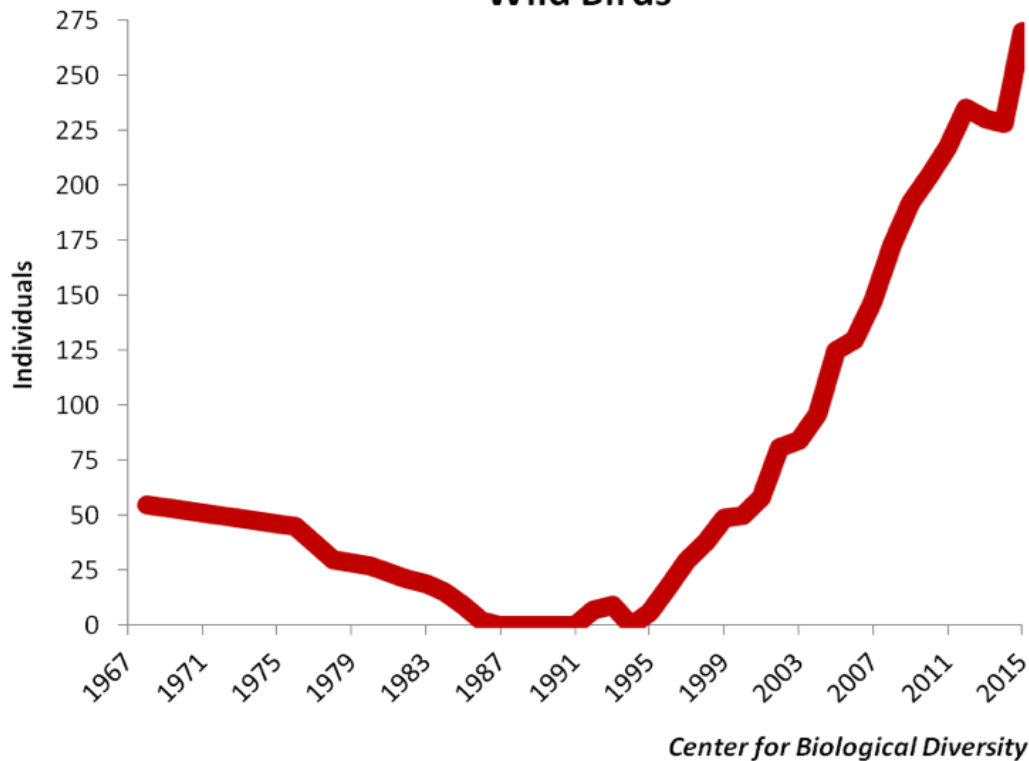


California condor Wild Birds



- Condor recovery has been a function of organic lead regulation – not inorganic (ammunition)
 - Elemental lead (inorganic) is used in bullets.
 - Bluish-grey metal that tarnishes easily in air to a dark grey. Naturally occurring lead ores comprise 0.002% (15g/t) of the earth's crust.
 - Ban on the use of lead shot (elemental) for hunting waterfowl nationwide in 1991 -
 - 2007, California bans the use of lead ammunition in Condor habitat

- From 1970 on, leaded gasoline (organic lead) use decreased until banned (1996) by the Clean Air Act
 - This is dangerous lead (organic) found in high lead content paint, soil, dust and various toxic consumer products. It is lead acetate, has a sweetish taste...even in paint...

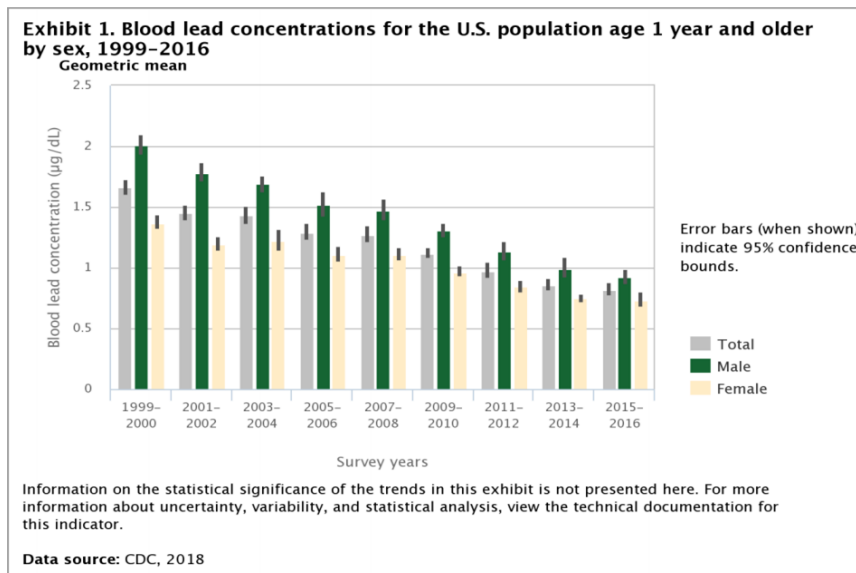
- Tetraethyl and tetramethyl lead is the form of lead used in leaded gasoline. The combustion of organic lead when added to gasoline as a fuel additive resulted in the release of lead into the atmosphere.
- Organic forms of lead are extremely dangerous, as they are absorbed through the skin and are highly toxic to the brain and central nervous system, much more so than inorganic lead.
- Elemental lead “must become solubilized to be absorbed, or show any intermediate outcome.” (Effects of lead from ammunition on birds and other wildlife: A review and update, Pain et. al., 2019)
 - **Bullets are generally not “solubilized”**

Most Common Sources of Blood Lead According to the Centers for Disease Control (CDC)

- Lead-contaminated house dust (lead paint in pre 1978 structures) is the most common source of exposure
- Lead in drinking water leaching from lead-containing pipes where acidic water creates bio availability (solubilizing elemental lead)
- Lead-glazed food containers (pottery), or alcohol in leaded glass/crystal.
- Lead from industrial processes
- Imported items produced in locations with less stringent regulations
 - Jewelry and candies,
 - Children's toys,
 - Cosmetics
- Folk, traditional or home remedies.
- Lead concentrations in soil, air, and water near historic industrial and mining
- Inner city soils (especially from contamination pre-1970 through 1990).
- Lead from cigarette smoke (average of 2.46 $\mu\text{g g}^{-1}$ per cigarette)

Acceptable/Normal lead levels according to (CDC, 2017)

- Children - non is ideal, but also impossible. Any Blood Lead Levels (BLLs) below 5 $\mu\text{g/dL}$ are considered normal
- Adults (BLLs) below 10 $\mu\text{g/dL}$ are considered healthy, not to exceed 5 $\mu\text{g/dL}$ during pregnancy
 - According to CDC BLL's in the 1970's where 15 –17 $\mu\text{g/dl}$ in the general population



- Average BLLs were 0.30 microg/dl higher Pb in hunters vs. non-hunters (1.27 average) – an amount undetectable using standard medical testing measures.
 - ND Study by National Center for Biotechnology Information

Under standard medical testing protocols - there is no detectable difference in BLL's between those who consume lead ammunition harvested game meat and those who do not.

