Raptor Pit Mortality in Mongolia and a Call to Identify and Modify Death Traps Wherever they Occur

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The list of mortality events due to drownings in steep-walled livestock watering tanks is long and growing. In southern Africa, Anderson et al. (1999) reported 163 separate cases involving 322 raptors of 29 species. Reports are also available for the western United States (Craig and Powers 1976), southwestern U.S. (Lafón 2006), United Kingdom (Male 1950; Ryves et al. 1950; Johnson 1991), Australia (Debus 1997), and elsewhere (Anderson et al. 1999).

Here, we focus on death pits in Mongolia but also introduce death traps of various types from other areas. In May 2008, in south-central Mongolia, we found several concrete pits with a total of 21 trapped raptors and one Common Raven (*Corvus corax*) (Fig. 1). These pits were built as underground cisterns, each with, as an entrance, a concrete pipe (1.0 m in diameter) vertically oriented. For two, about 1.5 m of pipe extended above ground. Below ground, the pipes opened into rectangular cisterns each about 2.1 × 3.0 m and 1.8 m tall. An unknown length of railroad railing lay crosswise below the concrete entrance pipe preventing collapse of the pipe into the pit below. Dead raptors in these pits included two Saker Falcons (*Falco cherrug*), two Golden Eagles (*Aquila chrysaetos*), 14 Upland Buzzards (*Buteo hemilasius*), and one small falcon (probably *F. tinnunculus*). In one of the pits, we also found one live adult female Saker Falcon. She was rescued, force fed a half crop of mutton, then flew ca. 200 m. After perhaps an hour she departed. At a third location, there were four vertical concrete pipes, each about 1 m in diameter and about 3 m tall. Beneath these there were either no underground pits or, less likely, pits filled with

sand. A single mummified Saker Falcon lay on the sand on the floor of one of these pipes.

Earlier (June 1997), we found Saker Falcons nesting on the floor of an above-ground concrete cistern also in south-central Mongolia (Ellis et al. 2009). Along with four live fledglings, we found the mummified remains of fledglings from previous year(s). The condition of the plumage of the dead fledglings led to the conclusion that these birds were not drowning victims, but rather they were unable to escape their nest chamber, the cistern floor 1.7 m below the rim.

Metal water tanks also trap many non-raptorial birds and mammals. A dry tank in southeastern Arizona contained several mummified white-nosed coatis (*Nausua narica*). Skeletons of mammals and birds, including eagles, are routinely found in full or empty tanks across the western United States. Other hollow structures also kill. About 1970, an American Kestrel (*F. sparverius*) was found mummified in a wood stove in a home in northeastern Arizona. It came down the ca. 15-cm-diameter flue (exhaust for the stove) perhaps in quest of a nest cavity. Dead Peregrine Falcons (*F. peregrinus*) are routinely found in industrial chimneys in Germany (Kleinstäuber et al. 2009). In 1974, a juvenile Red-tailed Hawk (*B. jamaicensis*), lost at hack near Augusta, Montana, was found months later dead in the grain storage bin of a “combine” (combination reaper thrasher). In November 2005, a Whiskered Screech-Owl (*Megascops trichopsis*) was found trapped ca. 1.3 m down in a 20-cm-diameter steel pipe gatepost near Oracle, Arizona. While removing the live owl, we found it had been resting on the mummified remains of an earlier victim (also a *Megascops* owl).

While some of the trapped raptors listed in this article could possibly have purposely entered the pits and pipes in

Fig. 1 Dead raptors (and one raven) removed from an empty cistern in south-central Mongolia, May 2008. The two largest birds are Golden Eagles; buzzards and falcons are also represented (Photo: David H. Ellis)

Fig. 2 Mongols and team moving above ground portions of a cistern death trap, May 2008, south-central Mongolia (Photo: David H. Ellis)

search of nesting sites or for water or to capture a previously trapped smaller animals, we believe that most or all were merely attempting to alight on the top of a structure they presumed to be solid, not hollow. When they went to touch down, and having expended all of their momentum, they fell into the pits and were unable to escape. Evidence that the live Saker Falcon, mentioned earlier, was so confined came from examining her and the walls of the concrete pipe. About 1 m above her railroad rail perch, there was a ring of blood splatters where she apparently clawed at the wall. Her talons, especially digits 2–4, were heavily worn and bleeding. Her face and throat were also bloodied. This was perhaps due to her efforts to hook the wall with her bill while simultaneously clawing at it.

Evidence that some of the other raptors in her same pit died similarly came from noting that they also had blunt

claws. Evidence that none of the raptors voluntarily entered the pits in pursuit of a smaller raptor trapped therein came from noting that none of the birds had been dismembered. Evidence that they died when the cisterns were empty came from the observation that the carcasses were mummified, intact, and fully articulated. The emaciated condition of the most complete mummies evidenced that they died of starvation.

These and similar observations across the globe call for remedies. We enlisted the aid of local Mongols and closed the two large pits we found in 2008 (Fig. 2), and we installed an escape ramp for the saker fledglings in the 1997 cistern. Various other solutions have been suggested for pit traps elsewhere. Craig and Powers (1976) recommended that a floating board could allow small birds to escape drowning in metal water reservoirs. Draining tanks when not in use would help, but falling into a very deep, drained tank would result in starvation, not drowning, so escape ramps are sometimes needed even in dry tanks. Hartley (1996), Anderson et al. (1999), and Lafón (2006) provide details of such ramps.

We urge that all cisterns on the vast Mongolian steppes be examined and, if lethal, be modified to either exclude birds or be provided with ladders to allow birds to escape. Homeowners and landowners around the globe should search for death traps on their properties and eliminate them. Even more important, we urge conservation groups to seek regulations requiring wildlife exclusion/escape devices on all pit-like structures (water storage tanks and otherwise).

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