

## COLLISION OF A RED-TAILED HAWK WITH AN ARTIFICIAL DUCK-NESTING STRUCTURE

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Many birds collide with static and mobile man-made structures whether concealed or conspicuous, raising conservation concerns (Bevanger 1994, Drewitt and Langston 2008, Martin 2011). In certain species, even predatory raptors, such high susceptibility to collision may be caused by relatively poor frontal vision (Bevanger 1994, Martin 2011), but it is still unclear why birds collide with obstacles under conditions of both good and poor visibility (Drewitt and Langston 2008, Martin 2011). Birds of prey are also known to be vulnerable to collision with man-made structures such as wind turbines (Madders and Whitfield 2006, Harness 2007, Lovich 2015), power lines and communication towers (Harness 2007, Jenkins et al. 2010), fast-moving vehicles and aircraft (Harness 2007), barbed wire or wire fence (Edeburn 1973, Anderson 1977, Harness 2007), as well as windows (Boal and Mannan 1999). All these collisions with man-made structures are just a few examples of humanity's numerous and diverse indirect effects on raptor populations. Here we report an unusual observation of mortality of a young raptor caused by an apparent collision with an artificial nesting structure established for ducks.

Artificial duck-nesting structures in the forms of open baskets, cone-shaped platforms, and nest boxes have been regarded as a useful technique for waterfowl management, improving the productivity of ducks (Bishop and Barratt 1970, Doty and Lee 1974, Eskowich et al. 1998, Chouinard et al. 2005). In particular, the number of cylindrical nest structures in wetlands has recently increased because of these structures' cost-effectiveness in attracting ducks as well as the additional protection from avian predators overhead (Eskowich et al. 1998, Opermanis 2004, Chouinard et al. 2005). In March 2015, three cylindrical nests were placed 50–90 m apart at northwest Mare Island (38° 06' N, 122° 17' W) in Vallejo, California, to assess the use of artificial nests by ducks in a coastal marsh of the San Francisco Bay area. Each nesting structure was made by rolling a thick layer of flax straw sandwiched by two welded wire fences and was installed on a tripod with wires and cable ties 1.5 m above the ground (Knowlton and Zolnowski 2000) to counter potential ground predators in the seasonal wetland. Although Mallards (*Anas platyrhynchos*) visited nearby water bodies, no ducks nested in the structures, which remained unattended through the rest of the year, probably as a result of California's prolonged drought.

In a misty rain in the morning (about 09:50) of 7 December 2015, we found a dead juvenile Red-tailed Hawk (*Buteo jamaicensis*) hanging head down from the nesting structure (Figure 1). The carpal joint of its right wing was caught in a joint between the fence forming the outside of the cylinder and a pole of its supporting tripod, but the bird was not actually impaled by cutting edges of wire fences nor caught in wires or cable ties. Although its crop was empty, it seemed to have been in good health, and we could not find any signs of fracture or head trauma. The eyes were almost intact and feathers were not deeply soaked in spite of the mist, suggesting that it had died very recently.

It is unclear why and how the young hawk became caught on the artificial nesting structure, but its position in death suggested that it had tried to avoid collision at the last moment by turning left to pass under the nest. Given the foggy and drizzling weather in the morning and the previous night, the bird possibly failed to detect the structure, or was just in a hurry to chase prey under limited visibility in the morning or the previous evening. Low light and behaviors such as swift pursuit of prey may

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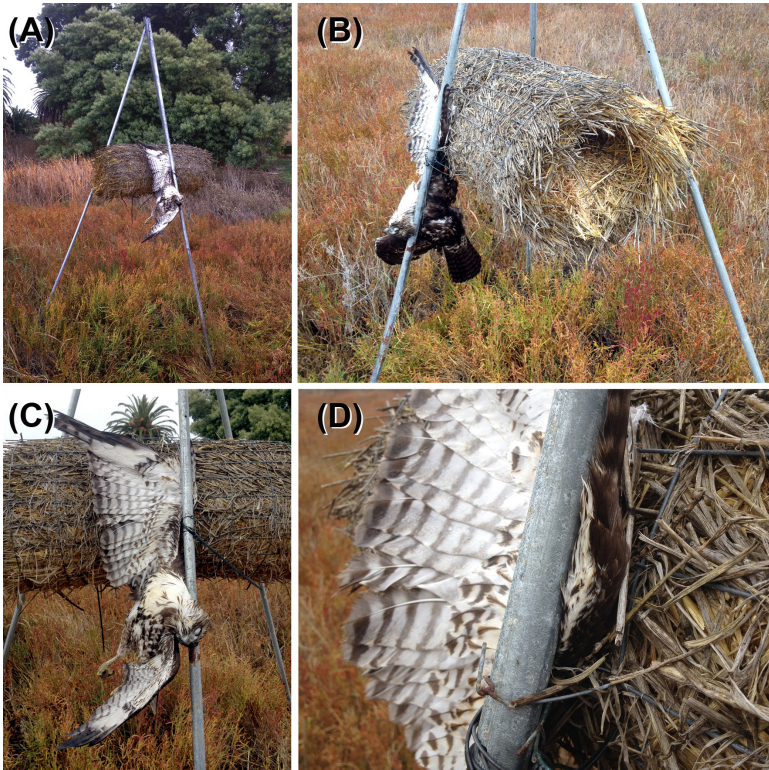


Figure 1. A juvenile Red-tailed Hawk (*Buteo jamaicensis*) killed by collision with and entanglement in an artificial duck-nesting structure. (A) Distant view of the nest structure and entangled bird; close views of (B, C) the entangled bird and (D) the carpal joint of right wing caught in the gap between the cylindrical nest and a pole of its supporting tripod.

Photo by Chang-Yong Choi

increase the risk of collision (Bevanger 1994), but the fundamental cause of this collision remains unknown.

We are not aware of a previous report of raptor mortality caused by an artificial duck-nesting structure. We do not think that this type of mortality is common or has an appreciable effect on raptors hunting in ducks' breeding habitats, as it is probably a rare cause of mortality for raptors. Nevertheless, given the increasing use of cylindrical duck-nesting structures for augmenting the productivity of waterfowl (Knowlton and Zolnowski 2000, Chouinard et al. 2005), we encourage regular monitoring of raptors' interactions with breeding ducks and reporting of further observations of such accidental death or injury. Although in this case the dead hawk was not impaled, better concealment of exposed cutting edges of fences and wires during the construction, placement, and management of artificial nesting structures will benefit waterfowl as well as raptors in helping to prevent such accidents in the future.

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## NOTES

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