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News, Notes, Comments

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**Last line of ACKNOWLEDGMENTS
should read as follows: Comments and
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Accumulation of Organic Material on the Talons of American Kestrels

Two American Kestrels (*Falco sparverius*) were captured in the Shenandoah Valley of Virginia with varying degrees of organic material accumulation on their talons and, in one case, the material was also present on the legs and feet. American Kestrels are routinely captured, banded and released in the Shenandoah Valley Raptor Study Area (SVRSA) which comprises approximately 38,300 ha centered roughly on Timberville, VA. Since the establishment of the SVRSA in 2008, we have been intensively studying kestrels year-round, both wintering birds and kestrels nesting in the 50 nest boxes within the study area. Over the past seven years, we have captured, banded and released 144 adult American Kestrels in the SVRSA and have captured only two (1.39%) kestrels (described below) with accumulations of materials on talons. We suspect these accumulations are organic material derived from the consumption of prey items coupled with inadequate postprandial cleaning behavior.

On 21 Mar 2014 a male kestrel was observed perched next to a female kestrel near a nest box within the SVRSA. Upon capturing the male kestrel utilizing a bal-chatri (Berger and Muelle 1959) with a mouse as a lure, we observed the talons on his medial toes (digit 2) bilaterally were completely encapsulated with what appeared to be organic material forming balls on the talons (see Fig. 1). The tips of the two encased talons were not visibly protruding from these balls. The accumulation of material was dark brown and had a roughly

spherical shape. It was so hard that we could not dent it with our fingernails. The hardened spheres had a smooth, almost polished, appearance. We removed the larger ball (approximately 14 mm by 11 mm) by crushing it with banding pliers causing it to fracture into several small pieces. The smaller ball (11 mm by 8 mm) we were able to slide off the other talon intact. This kestrel otherwise appeared to be in good health.



Fig. 1. Hard organic balls encasing talons of male kestrel.

The second kestrel with accumulations of organic material on the talons, legs and feet was an adult female captured on 17 May 2014 in a nest box containing her young. This falcon had what appeared to be an accumulation of organic material on all eight of her talons extending onto the distal most tips of her digits and plantar aspect of both feet (digital pads). (see Fig. 2). An abnormal accumulation of the brown material was also noted on the dorsal aspect of tarsometatarsus extending proximally along the dorsal tibiotarsal scales. The material that had accumulated on this falcon encompassed more surface area of the falcon's foot than the previously captured male kestrel, but consisted of softer, less dense material and the tips of her talons were still exposed. While defending herself during capture, she was able to place all eight talon tips into the skin of her captor. The nest

box she was captured in contained five young kestrels approximately six days of age. The interior of the nest box was wet from recent rains and the bottom of the box was covered with soggy pellets, old prey remains and excrement from the young kestrels. Nest boxes with wet contents are not uncommon in the SVRSA but the accumulation of material on the adult kestrels is abnormal.



Fig. 2. Organic accumulations of female Kestrel talons, legs and feet.

We surmised that the organic material accumulations on these two kestrels is a symptom of aberrant behavior. Normally, a raptor eating prey items too large to swallow whole will secure the prey with the two medial talons which allows the raptor to pull upward with its beak to tear off small pieces of food. After a raptor has finished eating, the next important behavioral step is to clean the medial talons with its beak and, to a lesser degree, clean the other talons, especially if they have small pieces of flesh attached to them (personal observation). The concluding act of eating is for the raptor to clean its beak by "feaking", the act of wiping its beak side to side on an "abrasive" surface (Fox 1995). In the case of the female kestrel with accumulation of materials on her talons, legs and feet, we concluded that her poor personal hygiene had allowed material to built up and persist. The falcon evidently was not cleaning herself thoroughly and her situation was probably exacerbated by the wet materials in the nest box.

Aberrant feeding behavior, such as omitting the act of cleaning its talons after feeding, could be chemically induced (Anger and Johnson 1985). In the mid-1980s, another research project conducted in the Shenandoah Valley, found measurable levels of dieldrin in all Loggerhead Shrikes (*Lanius ludovicianus*) tested (Blumton 1989). Dieldrin, a persistent organic pollutant that is known to biomagnify, has been shown to alter avian hunting and feeding behavior (Busbee 1977). Frances Hamerstrom (1979) found in Wisconsin pre-and post-DDT years (before 1965 and after 1969) that Northern Harrier (*Circus cyaneus*) were aggressively striking her while she banded young in the nest, this being normal nest defense behavior. Hamerstrom resorted to banding the nestlings lying on her back with her feet in the air, offering the attacking harriers the least painful target (personal communication). After DDT had been banned in 1970, Hamerstrom reported recovery of normal Northern Harrier behavior, including the return of "sky dancing" and the return of normal food transfers instead of the DDT-induced talon-to-talon aggressive aerial food transfers.

Published accounts describing similar organic accumulation of materials on raptor talons are scarce. Bartel (1984) reported trapping a kestrel in a dump in Chicago, IL, with a one-inch (2.54 cm) almost round "... apparent growth on its center toe of its right leg." Later, after removing the "growth" from the kestrel's talon, the author concluded that it was manmade, possibly Plaster of Paris, and that someone must have intentionally placed it on the kestrel's talon. We were unable to find other documented cases of abnormal accumulation of materials on raptors' talons or legs and feet.

There have been significant declines in American Kestrel populations across most of North America. Both breeding bird surveys (Smallwood et al. 2009) and migratory hawkwatch stations confirm downward trends (Farmer and Smith 2009). At this time, researchers have not reached a consensus as to the cause (or causes) of decreasing populations of kestrels (Bird 2009). Declines in kestrel populations in North America are likely due to

multiple factors, not the least of concern is environmental pollutants such as DDT, PCBs, heavy metals, pesticides, and brominated flame-retardants, which cause both direct (i.e., morbidity and mortality) and indirect effects (i.e., behavioral changes) on predators such as American kestrels (Ferne et al. 2009).

We describe these abnormal Kestrels at this time because we have not observed previously this phenomenon during our previous six years of kestrel research within the SVRSA. We found abnormal accumulation of material on adult Kestrel talons is uncommon (two instances is 1.39% of the total number of adult kestrels captured), but it is worth noting that both occurred in the same year (2014). These two Kestrels were captured 20 km apart and 57 days apart in time and are probably not directly correlated except that they both reside within the study area. We intend on recapturing the two aforementioned Kestrels to determine if these abnormal accumulations have recurred. If the abnormal accumulation of material is found again on these birds, further studies will be performed to determine the composition of the material and a medical workup on the raptors, including testing blood samples for toxins will be performed. Continuation of this long-term study and the recapture of these particular Kestrels will help determine whether these two birds are anomalies or represent emergent behavioral problems. The seemingly aberrant personal hygiene of these two Kestrels, although circumstantial evidence, could be a symptom of a larger problem affecting raptors, specifically the loss of American Kestrels here in the eastern United States (Bird 2009).

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