

Spots and Stripes: A Novel Recorded Interaction Between a Plains Spotted Skunk (*Spilogale interrupta*) and Raccoon (*Procyon lotor*)

Jenell de la Peña^{1*}, Daniel Benson¹, Zackary Cordes², and Christine C. Rega-Brodsky¹

Abstract – A novel competitive interaction between *Spilogale interrupta* (Plains Spotted Skunk) and *Procyon lotor* (Raccoon) was captured during a camera trapping study on 22 February 2020 in Gray County, Kansas. Over a 9-min period, a Plains Spotted Skunk and Raccoon were recorded competing over access to a can of sardine bait. Both individuals attempted to reach the bait, with the Plains Spotted Skunk responding to the Raccoon with its characteristic handstand display until the skunk retreated. While rarely observed, these types of interactions provide insights into coexisting species and offer a glimpse into mesocarnivore relationships in the central Great Plains. Documenting such interactions is crucial for comprehending carnivore community dynamics, especially for a species of conservation concern like the Plains Spotted Skunk.

Within the dynamic framework of an ecosystem, species have the potential to interact and compete for the use of similar resources. These types of interactions can play a pivotal role in shaping ecological communities, especially as new species enter the community and others depart. While 2 species that co-occur in 1 area may imply their potential interaction, the understanding of how and if 2 species interact may be less well understood or undocumented, especially for cryptic species (Cazelles et al. 2015). This note explores a unique interaction between 2 mesocarnivores: a species of particular interest due to its conservation significance and ecological role, and a widespread ubiquitous species.

Small carnivores, particularly *Spilogale interrupta* (Rafinesque) (Plains Spotted Skunk), add a distinct facet to the exploration of mesocarnivore interactions. Listed as state-threatened or endangered throughout much of its range, Plains Spotted Skunks were once widespread, but have experienced ongoing population declines. The Plains Spotted Skunk's smaller size also makes the species a potential indicator of responsiveness to ongoing environmental changes (Jachowski et al. 2023); therefore, it is essential to scrutinize the species' behaviors, interactions, and ecological role. To document the Plains Spotted Skunk in Kansas, we executed a statewide camera trapping study in which we aimed to describe the presence of this once-common species (Benson 2024). Herein, we report on an opportunistically observed interaction between a Plains Spotted Skunk and *Procyon lotor* (Linnaeus) (Raccoon).

We deployed cameras across 26 counties in Kansas between 2016–2021. Our survey sites were selected in state-designated critical habitat and areas distinguished by historic Plains Spotted Skunk occurrence. We deployed 719 baited camera traps over a total of 20,801 trap nights across our study area. Cameras (Browning Strike Force HD) were set to take 3 photographs per camera trigger event, with a 1-min delay setting, and were secured to a tree or post 2–4 m opposite the bait (Hackett et al. 2007). A variety of scent lures were used throughout

¹Department of Biology, Pittsburg State University, 1701 S Broadway St., Pittsburg, KS 66762. ²Kansas Department of Wildlife and Parks, 512 SE 25th Ave., Pratt, KS 67124. *Corresponding author: jenell.dlp@gmail.com

the surveys; however, the site where the competitive interaction occurred was baited with 1 can of sardines in oil and cherry oil scent lure. All cameras were deployed for an average of 4 weeks; Secure Digital (SD) cards and bait were replaced every other week. Subsequently, each image was manually examined for any Plains Spotted Skunk presence.

The camera site that recorded the interspecific interaction was deployed on 5 February 2020 for a total of 29 trap nights. The first Plains Spotted Skunk detection occurred on 21 February (latency to detection = 16 days); Plains Spotted Skunks were detected on 3 separate occasions at this site. The camera was located in Gray County along the Arkansas River floodplain in riparian vegetation composed of *Salix* spp. (Linnaeus) (Willow) and *Populus deltoides* (W. Bartram ex Marshall) (Eastern Cottonwood) in the overstory. The ground cover consisted of patchy *Phragmites australis* ([Cav.] Trin. ex Steud.), accompanied by leaf litter, surface rock, and limited large woody debris. The camera was located within an agricultural landscape of wheat, alfalfa, and sorghum crop fields, located approximately 2 km from a small town (population 1,830; 613 residents/km²) and 27 km from the nearest city (population 27,721; 726 residents/km²) (US Census Bureau 2022).

On 22 February 2020 at 19:41, we documented a sequence of 21 images spanning a 9-min period, capturing a unique interaction between a Plains Spotted Skunk and a Raccoon (Fig. 1). In the initial images, both species were observed beside each other near the bait affixed to a tree. The Raccoon withdrew to ~0.5 m away from the Plains Spotted Skunk, still in the frame, and maintained visual contact with the Plains Spotted Skunk. In the following series of images, the Raccoon appeared on the opposite side of the frame, positioning itself at a similar distance from the Plains Spotted Skunk and maintaining a visual of both the Plains Spotted Skunk and the bait. Following a brief 3-min absence of the Raccoon with the Plains Spotted Skunk alone in the frame, the Raccoon returned, approaching from the camera's perspective. The Plains Spotted Skunk was then observed in a prone stance facing the bait with its head turned over its right shoulder, looking towards the camera at the location where the Raccoon appeared in the next image. The profile of the Raccoon was then observed looking at the Plains Spotted Skunk executing the species' distinctive handstand display facing the Raccoon, with both animals captured in the same frame. Despite this display, the Raccoon persisted in its attempt to reach the bait. In the next 3 consecutive images, the Raccoon was observed biting and handling the attached bait with its forefeet, while the Plains Spotted Skunk remained next to the Raccoon's back paws, in the same location of the handstand display. In the following series of images, the Plains Spotted Skunk positioned itself ~2 m away with its hindquarters towards the camera (with only its tail and anal region visible in the frame), while maintaining a prone stance facing the Raccoon that continued to handle the bait, until both species were no longer in the frame.

To our knowledge, this is the first reported interaction observed between a Plains Spotted Skunk and a Raccoon. There has been minimal documentation of mesocarnivore guild interspecific interactions within the genus *Spilogale* (Allen et al. 2013, Gates 1937, Pérez-Irineo et al. 2020, White et al. 2023), particularly with raccoons (Arts et al. 2021, Gompper 2017). The observed interactions with the bait by both species, coupled with the subsequent handstand display and behavioral responses, may indicate a failed defensive display attempt by the Plains Spotted Skunk (Johnson 1921).

The Plains Spotted Skunk plays an important role in the stability and diversity of carnivore communities (Jachowski et al. 2023, Marneweck et al. 2022); thus, an increase in Raccoon populations within more rural locations may have potential cascading effects on the overall health of the ecosystem (Peek 2023). Especially within the Great Plains ecosystem where the Plains Spotted Skunk is in decline, the persistence of both species may indicate

an increase in interspecific competition between a generalist synanthropic species and a cryptic species of conservation concern (Gompper and Hackett 2005). Considering the local landscape changes in agriculture and urbanization in Kansas, Raccoons may be able to outcompete Plains Spotted Skunks due to their ability to thrive in and near anthropogenic environments. In addition to competition, our results may also indicate the potential for disease transmission between Spotted Skunks and Raccoons given the proximity and duration of the observed interaction (Gulas-Wroblewski 2021). Infectious diseases carried by Raccoons, particularly canine distemper and rabies, have caused high mortality in *Spilogale putorius* (L.) (Eastern Spotted Skunk) (Gulas-Wroblewski 2021, Harris et al. 2021). Thus, we must consider the role of Raccoons as disease vectors in mesocarnivore communities.

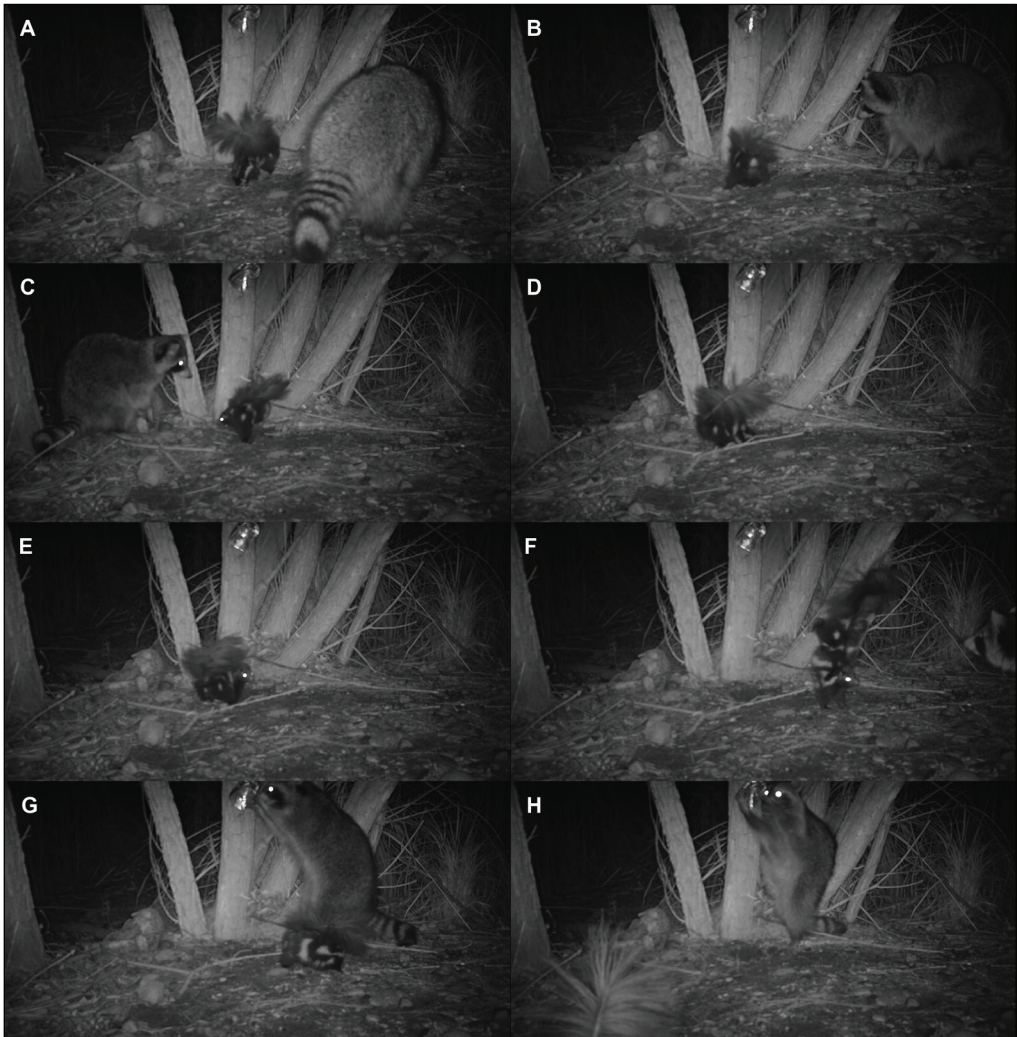


Figure 1. Images depicted were selected from 21 photos captured during a 9-min interaction between a *Spilogale interrupta* (Plains Spotted Skunk) and *Procyon lotor* (Raccoon) on 22 February 2022, beginning at 19:41. Images are presented chronologically from the start (A) to the end (H) of the interaction.

Our novel recording of an interaction between a Plains Spotted Skunk and Raccoon is a useful addition to the Spotted Skunk literature. It is important to investigate mesocarnivore interspecific interactions to contribute to our understanding of Spotted Skunk population dynamics, especially as we observed their antagonistic response to a Raccoon when located nearby. This opportunistic observation serves as a novel documentation of the intricacies of the interspecific interactions concerning a species of conservation concern and may provide insight into the carnivore community dynamics of this population within the central Great Plains.

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