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OBSERVATIONS OF BADGERS PREYING ON BLACK-TAILED PRAIRIE DOGS — American badgers (*Taxidea taxus*) often visit black-tailed prairie dog (*Cynomys ludovicianus*) colonies, most likely in search of prey (Lomolino and Smith 2004, Shaughnessy and Cifelli 2004). Badgers are well suited to hunting fossorial prey such as prairie dogs by excavating burrows and capturing individuals belowground (Lindzey 2003). However, the ecological literature is sparse regarding details of how badgers hunt and capture prairie dogs underground. Eads and Biggins (2008) documented three occurrences of a badger excavating prairie dogs. That badger (apparently the same individual) had a den within the prairie dog town where captures occurred. This note documents two additional observations of badgers excavating and capturing prairie dogs.

At 0900 hr on 21 June 2008, a badger was observed and subsequently videotaped hunting black-tailed prairie dogs in Wind Cave National Park (Custer County, South Dakota in the southern portion of the Black Hills). The site was mixed-grass prairie on a Hilger cobbly loam soil formation (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>). The badger was first observed on the periphery of a prairie dog town running toward the interior. Prairie dogs were observed emitting alarm calls and consequently fleeing toward burrow mounds. The badger ran from mound to mound, often bounding up on its hind feet, apparently to better survey the prairie dog town. As the badger approached a prairie dog the latter would escape down a burrow. The badger made no apparent effort to catch the prairie dog before it entered the burrow; however, the badger did subsequently inspect the burrow opening. I obtained video footage of the badger inspecting three holes. Additionally, the badger inspected 2–5 holes prior to the start of the video. In all but the last case the badger moved to other holes within a few (<5) seconds and without excavating burrows. At the last burrow the badger immediately started digging and was below ground surface in 7 seconds. The badger resurfaced approximately every 90 seconds and surveyed the surroundings for approximately 6 seconds before re-entering the burrow. While the badger was belowground, dirt was occasionally observed being pushed upward from the burrow, indicating the badger was excavating the burrow in pursuit of the prairie dog. Twenty-nine minutes after it started excavating the burrow the badger appeared aboveground with a live prairie dog in its mouth. The badger's bite was directed dorsal to the thorax, similar to that described by Michener and Iwaniuk (2001) for badgers killing Richardson's ground squirrels (*Spermophilus richardsonii*) and by Eads and Biggins (2008) for badgers killing prairie dogs. After surveying its surroundings for 10 seconds, the badger carried the prairie dog to a nearby colony where it entered a burrow approximately 480 m from the capture site. Subsequently, two badgers emerged from the burrow, thereby suggesting a nursery den.

On 31 July 2008, I used a burrow-inspection camera to inspect the excavated burrow. The length of the dead-end burrow was 3.5 m, however, this measurement should be viewed with caution since 40 days had expired since the badger excavation. Admittedly, prairie dogs or other animals may have modified the burrow dimensions prior to measurements.

A similar observation of a badger hunting black-tailed prairie dogs occurred at Scotts Bluff National Monument (Scotts Bluff County) in western Nebraska on 25 June 2008. That badger spent 30 minutes inspecting holes. In contrast to the observation described herein, that badger partially excavated an unknown number of burrows before moving to other burrows. At one hole the badger started digging and only "came up once or twice." Approximately 46 minutes later the badger emerged from the burrow with a prairie dog (Melanie Weber, National Park Service, 6424 West Farm Road 182, Springfield, Missouri 65738, unpublished data).

The colonial nature of prairie dogs and their cooperative defense strategy, combined with the sparse vegetation and flat topography in some prairie dog towns, may limit the effectiveness of a stalking or ambush strategy. However, Eads and Biggins (2008) described an encounter where a badger used a den within a prairie dog town as an ambush point to capture prairie dogs aboveground. When concealment cover is unavailable, badgers appear to use a variation of a pursuit strategy by flushing fossorial prey, identifying vulnerable individuals, and pursuing them into burrows. Michener (2004) reported that badgers primarily captured Richardson's ground squirrels underground and rarely intercepted fleeing ground squirrels aboveground. Although Eads and Biggins (2008) observed two successful aboveground captures of prairie dogs by badgers, they too reported that aboveground captures were rare and that badgers more commonly hunt prairie dogs via excavation. Murie (1992) suggested that badgers used olfactory and audible clues to locate and dig up belowground Columbian ground squirrels (*Spermophilus columbianus*), and that they primarily captured juveniles. Moreover, Armitage (2004) reported that badgers captured yellow-bellied marmots (*Marmota flaviventris*) belowground and that they disproportionately captured young animals. In contrast, Eads and Biggins (2008) reported that all three prairie dogs they observed captured underground by a badger were adults.

Like the burrows of many ground-dwelling sciurids, prairie dog burrows often have more than one opening (Sheets et al. 1971, Hoogland 1995), providing animals with multiple escape exits. However, Lampe (1976) reported that badgers often trap ground squirrels in dead-end tunnels and Eads and Biggins (2008) reported a single opening from the one excavation they inspected. Capturing prairie dogs in dead-end burrows is consistent with my observation. Because the badger immediately started excavating the burrow where it was ultimately successful suggests that it might have known that there was no escape exit. Perhaps it

could detect a difference in airflow or temperature between dead-end burrows and those with more than one opening (Vogel et al. 1973). The two incidents reported here and observations by Eads and Biggins (2008) suggested that, on average, badgers excavated prairie dogs in 38 minutes ($n = 4$, range = 11–66 minutes). Observations reported here increases our knowledge of how badgers hunt and capture black-tailed prairie dogs.

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