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PRAIRIE FALCON DEPREDATION ATTEMPTS ON A GREATER PRAIRIE-CHICKEN LEK IN SOUTH-CENTRAL NEBRASKA

—Little information exists concerning Prairie falcons' (*Falco mexicanus*; PRFA) seasonal movements, habitat use, and diet outside of the breeding season; this is especially true in the eastern portion of its wintering and migratory range (Steenhof 1998, Sharpe et al. 2001, Steenhof et al. 2005). Prairie falcons prey on ground squirrels (*Spermophilus spp.*), prairie dogs (*Cynomys spp.*), wood rats (*Neotoma spp.*), and other rodents during the breeding season (Bond 1936, 1942, MacLaren et al. 1988, Steenhof 1998, Steenhof et al. 1999, Johnsgard 2013). They utilize avian prey regionally as well, including western meadowlarks (*Sturnella neglecta*), horned larks (*Eremophila alpestris*), mourning doves (*Zenaidura macroura*), and others (Fuertes 1905, Tyler 1923, Fowler 1931, Boyce 1985). As Steenhof (1998) notes, studies of PRFA diet have focused largely on remains recovered at nesting sites during the breeding season and less is known about their non-breeding season food habits. Prairie falcons are known to prey upon horned larks, western meadowlarks, and occasionally voles (*Microtus spp.*) during the winter and early spring months (Enderson 1964, Beauvais et al. 1992, Steenhof 1998).

From 30 January to 20 May 2015, we monitored an active greater prairie-chicken (*Tympanuchus cupido pinnatus*; GRPC) lek on Mormon Island, Hall County, Nebraska, USA. Mormon Island consists of 1,100 ha of predominantly relict lowland tallgrass prairie and wet meadow habitat with interspersed sandy ridges, bordered on both sides by channels of the Platte River (Currier 1982, 1989, Nagel and Kolstad 1987). Mormon Island has been managed with rotational cattle grazing and prescribed fire to mimic historic disturbances, maintain a mosaic of habitats, and promote native biodiversity (Currier 1982, Briggs et al. 2005, Fuhlendorf et al. 2009). This large intact prairie provides habitat for an isolated breeding population of GRPCs within the central Platte River Valley, about 40 km southeast of the nearest regular booming grounds in northwest Hall County (Lingle et al. 1994, Svedarsky et al. 2000, Sharpe et al. 2001, Johnsgard 2016). The lek was centered 60 m west of a stock tank on an upland sandy ridge rising 1 to 1.5 m above the surrounding landscape within a pasture that had been grazed the previous growing season; vegetation height at the lek site was approximately 3 cm. Mesic lowlands (common threesquare, *Schoenoplectus pungens*; switchgrass, *Panicum virgatum*) surrounding the lek site were lightly grazed the previous growing season and provided escape cover for GRPCs within 20 m of the lek site (Jones 1963, Currier 1989, USDA-NRCS 2017). At least once per week one to two observers recorded depredation attempts of GRPCs at the lek noting the species attempting depredation, its behavior, and the behavior of the GRPCs. A total of 19 observations were made from a camouflaged pop-up blind at a distance of about 55 m using an 80 mm spotting scope beginning 10 min before

sunrise and continued for 1 hr. Behavioral descriptions of depredation attempts were made in narrative form and every effort was made to take photos of events.

On 15 Mar 2015 and 26 April 2015, we documented PRFAs attempting to depredate lekking GRPCs. One of the two observed attempts resulted in direct contact between a PRFA and a male GRPC and appeared potentially successful, though the ultimate outcome was unknown. On 15 Mar 2015 as 14 male GRPCs were actively displaying in the presence of 1 female, a PRFA dove at a male and missed its target as the GRPC leapt into the air flushing from the lek. The PRFA continued to follow the targeted GRPC, which gained distance ahead of its pursuer as they flew out of view. On 26 April 2015, 9 male GRPCs interrupted display activity and squatted on the ground at the lek site just before a PRFA completed a stooping dive landing on a GRPC with its talons. The GRPC flew from the ground following the impact and began a low (about 10 m altitude) straight and fast flight for several hundred meters closely pursued by the PRFA before flying out of view. Following the attack, the remaining GRPCs flushed from the lek and remained squatting near the cover present around the lek site's lowland edges for the remainder of the observation (about 10 min). The PRFA attack approaches we documented were short stooping dives from fast level approach flights of between 15 m and 30 m in height. This PRFA attack approach is consistent with what Haak (1982) termed a "straight attack" and has been commonly observed in Nebraska (Johnsgard 2013). The PRFA depredation attempts documented herein were directly focused on individual GRPCs at the lek. This is notable as many raptor species have been documented to target the lek generally by flushing multiple GRPCs with a low slow approach (Berger et al. 1963).

Of the four depredation attempts by raptors witnessed during our study, only the 26 April 2015 PRFA attack resulted in direct contact with a GRPC but all attempts elicited a predator avoidance response from the majority of the lekking GRPCs. Berger et al. (1963) found that most raptor encounters at GRPC leks alter behavior, but very few lead to a successful depredation. Attempted or successful attacks by raptors on adult GRPCs at the lek have been documented for the northern harrier (*Circus cyaneus*; 2 unsuccessful attempts in this study), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*B. lagopus*), ferruginous hawk (*B. regalis*), broad-winged hawk (*B. platypterus*), northern goshawk (*Accipiter gentilis*), Cooper's hawk (*A. cooperii*), bald eagle (*Haliaeetus leucocephalus*), snowy owl (*Bubo scandiacus*), great horned owl (*B. virginianus*), and peregrine falcon (Lehmann 1941, Yeater 1943, Ammann 1957, Berger et al. 1963, Hamerstrom et al. 1965, Sparling and Svedarsky 1978, Robb and Schroeder 2005). However, to the best of our knowledge no record of a PRFA attempting to depredate an adult GRPC while on the lek has been documented in the literature. Prairie falcons have been recorded to attempt or

succeed in depredated other species of grouse including the lesser prairie-chicken (*T. pallidicinctus*; Schroeder and Baydack 2001), sage grouse (*Centrocercus urophasianus*; Hartzler 1974), and sharp-tailed grouse (*T. phasianellus*; Bendire 1892, Cameron 1907). This note adds to the list of species known to attack GRPCs on the lek, furthering the argument that lekking GRPCs often are a low success opportunistic target for a variety of resident and migratory raptors with somewhat generalist food habits (Berger et al. 1963). This research also provides information regarding the variety prey items targeted by PRFAs during the late winter and early spring months, outside of their breeding range.

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