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LEKKING BEHAVIOR OF A SHARP-TAILED GROUSE IN SOUTH-CENTRAL NEBRASKA

Kelsey C. King

Andrew J. Caven

Keith Geluso

LEKKING BEHAVIOR OF A SHARP-TAILED GROUSE IN SOUTH-CENTRAL NEBRASKA—Sharp-tailed grouse (*Tympanuchus phasianellus*; STGR) occur throughout much of the northern Great Plains, and historically were suspected to have ranged as far south as Kansas (Connelly et al. 1998). Sharp-tailed grouse were the dominant grouse in Nebraska 200 years ago, but early settlers and their associated agricultural practices extirpated STGR from much of their former range, including Kansas and southern Nebraska (Sisson 1976, Johnsgard 2016). During the period of initial land conversion, the greater prairie-chicken (*T. cupido*; GRPC) filled the void, benefiting from small plots of cropland providing winter forage, and outcompeting the STGR (Johnsgard and Wood 1968, Svedarsky et al. 2000, Johnsgard 2016). However, as agriculture intensified, both grouse species declined throughout their historic and acquired ranges (Johnsgard and Wood 1968, Sisson 1976). In areas where both grouse species occurred sympatric, they were hunted until 1929 when hunting seasons were closed due to low populations (Sisson 1976). Unfortunately, a drought exacerbated those declines, and prairie grouse did not reach pre-drought population levels until about 1950. Since then, both species have been relatively stable in their remaining core habitats in Nebraska, which includes the Sandhills for both species (Sisson 1976, Sharpe et al. 2001).

In winter and early spring of 2015, we observed a known lek for GRPC on Mormon Island, an 1,100 ha area of primarily remnant tallgrass prairie and wet meadow habitat bordered on both sides by channels of the Platte River, centered about 16 km southwest of Grand Island, Nebraska, USA. Starting approximately 10 minutes before sunrise, we made observations (~ 1 hr in duration) at least once per week from 30 January to 20 May 2015 using an 80 mm spotting scope from a temporary blind about 55 m west of the lekking grounds. On the morning of 1 April 2015, we first detected a male STGR lekking with 13 male GRPCs and two attending female GRPCs. A single STGR, likely the same individual, was observed during each visit to the lek after the initial detection until 20 May 2015. The STGR was present for a minimum of 50 days. No systematic observations of the lek were made in 2016.

From 19 March to 2 April 2017, three motion activated trail cameras (XR6 UltraFire Covert Camera and PC800 HyperFire Professional Semi-Covert Camera Trap; Reconyx, Holmen, Wisconsin, USA) were deployed on the lek. We detected a single male STGR on 9 mornings and 1 afternoon (1630 h 28 March 2017) during this time, displaying and occasionally directly interacting with lekking male GRPCs (Fig. 1). Field observations (same methods and blind location as in 2015) conducted on 7 April and 8 April 2017 also detected a STGR lekking with as many as 13 male GRPCs and two attending female GRPCs.

In Nebraska, the distributional range for STGR is defined as "all counties north of the North Platte and Platte Rivers, east to Knox County" (Sharpe et al. 2001). The lek location herein on a prairie island surrounded by the Platte River is

Figure 1. Sharp-tailed grouse (*Tympanuchus phasianellus*) in background with greater prairie-chicken (*Tympanuchus cupido*) in foreground on lekking site on Mormon Island, Hall County, Nebraska, 21 March 2017.

beyond recently known breeding limits for STGR in the state. No STGR breeding or lekking behavior has been recorded on Mormon Island in minimally 37 years (Crane Trust 1980–2017 unpublished data, Lingle and Hay 1982, Sharpe et al. 2001, Mollhoff 2001, 2016). This lekking site was approximately 40 km from the nearest habitat in northwestern Hall County delineated by Sisson (1976) as Sandhills prairie, the preferred habitat of STGR in Nebraska (Sharpe et al. 2001). That area had been known to occasionally have STGR lekking with GRPCs, but STGR had not been observed lekking south of this site in recent years (Lingle et al. 1994, Sharpe et al. 2001, Mollhoff 2001, 2016). A possible nesting observation also has been recorded as close as eastern Dawson County, with the only records of potential nesting south of the Platte River occurring in extreme southwestern Nebraska in Dundy County (Mollhoff 2001, 2016). Sisson (1976) observed a maximum movement of 53.6 km by a STGR using a mark-recapture (trapping and banding) methodology. Therefore, it is within known capabilities of STGR to have dispersed from the Sandhills prairie northwest of Grand Island, or slightly farther, to the lekking grounds on Mormon Island. Data from eBird (2017) suggest that the location on Mormon Island represents one of the southernmost detections of a STGR in Nebraska in the last 10 years, only exceeded to the south by a 1 May 2016 sighting at Dogwood Wildlife Management Area in Dawson County, also along the Platte River about 145 km west of our study site.

Mixed leks of prairie grouse are relatively common in Nebraska where STGR outnumber GRPCs two to one (historically three to one) and the two species overlap significantly in habitat and range, especially in the Sandhills in north-central Nebraska (Sisson 1976, Sharpe et al. 2001). Some authors report that in mixed leks STGR outcompete GRPCs (Kobriger 1965, Teopfer et al. 1990). However, in 2015 we observed that the male STGR was subordinate, tending to crouch and retreat from male GRPCs as they sparred and defended positions. Sisson (1976) reported that males, as they age, progress from the outskirts of leks to the prominent inner circle. In spring 2015, the STGR may have been young, explaining his subordinate position and tendency to forage and display on the outer edges of the lek. Our observations in April 2017 demonstrated the STGR was more centrally located on the lekking grounds following the progression described by Sisson (1976). Although GRPC and STGR hybrids are not uncommon (Sisson 1976), we did not document any morphologically identifiable hybrids during our observations in 2015 and 2017.

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