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First Documented Cases of Polygyny in the Grasshopper Sparrow

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ABSTRACT.—We studied the breeding biology of Grasshopper Sparrows (*Ammodramus savannarum*) on restored grasslands in Maryland from 1999 to present. We report the first documented cases of social polygyny in this species. Polygyny increased reproductive success

for males in two of four cases, but its rarity suggests it is only a facultative behavior for this usually socially monogamous species. Received 31 J7cies

TABLE 1. Characteristics of nests and territories held by Grasshopper Sparrows (GRSP) involved in polygyny on the CRFRC grasslands, Maryland.

Case	Male ^a	Year	Nests			Distance apart (m)	# of territory points	# of non-territory points ^d	Territory size	
			Nest ^b	Nest fate ^c	In or out of territory				Area (ha) ²	Perimeter (m)
A	MRTX	2008	NF10GS6	F	Out	17.5	21	20 (c,f,g,z)	0.26	214
			NF10GS7	D	In					
B	TBTX	2004	NF4GS15	F	In	19	42	12 (c,z)	0.388	257
			NF4GS16	D	In					
C	YRMX	2004	NF8GS1	F	In	116	95	27 (c,g,p,t,z)	0.719	344
			NF8GS2	F	Out					
D ^e	OBKX	2007	NF11GS2	F	Out	90	21	10 (c,g,z)	0.282	240
			NF10GS2	F	Out					

^a Abbreviated color combination of males. X is the federal aluminum band.

^b N = nest, F = field #, GS = GRSP nest #.

^c D = Depredation, F = Fledged.

^d C = chipping, F = foraging, G = carrying food, Z = perched, P = preening, T = trill.

^e The third suspected nest was not included as it could not be positively confirmed.

established a second territory, but in both cases this was well after all nests had fledged.

In case A, male MRTX was seen first singing on 5 May, the clutch completion date was 26 June for nest # 1 and 25 June for nest # 2, and he was last observed singing on 13 August. In case B, male TBTX was first seen singing on 23 April, clutch completion dates were 22 June for both nests # 1 and 2, and this male was last observed singing on 18 August. In case C, male YRMX was first seen singing on 19 May, clutch completion dates were 15 June for nest # 1 and 19 June for nest # 2, and he was last observed singing on 20 July. In case D, male OBKX was first seen singing on 1 May, clutch completion dates were 14 June for nest # 1 and 21 June for nest # 2, and he was last seen singing on 30 July (Table 1). Six of the nine nests fledged all nestlings successfully; the other three nests failed due to depredation.

We recorded as many waypoints as possible for all Grasshopper Sparrows on the CRFRC grasslands, but the number of waypoints per territory varied. The frequency and intensity of singing by males varied depending on the stage of the breeding episode. Males sang vigorously upon arrival, during territory establishment, female courtship, nest building, egg laying, and the early incubation period. Singing declined towards the end of incubation and almost no singing occurred during provisioning and fledging of the nestlings. Insufficient territory waypoints were obtained in some cases prior to provisioning and fledging of nestlings. The boundaries of those territories (as we perceived them) were probably smaller than

the actual size. Nests, in some cases, were outside of the depicted territory boundaries.

DISCUSSION

Our observations of social polygyny document rare exceptions (0.37%) in this normally socially monogamous species. They are novel for the species and add Grasshopper Sparrows to the growing list of birds for which some social polygyny is now known (Ford 1983). Polyterritoriality, the concurrent holding of two or more disjunct territories (Ford 1996), has not been recorded in the CRFRC population of Grasshopper Sparrows. Males have defended two and sometimes three sequential territories in a breeding season, but have not held more than one concurrently. The observation that polygynous nests were outside the circumscribed boundaries of the males' recorded territories may be due, in part, to an inadequate number of territory waypoints. However, female Grasshopper Sparrows have a strong tendency to place their nests outside or at the edge of territory boundaries (DMS, unpubl. data).

That six of the nests in these four cases of polygyny were successful suggests that Grasshopper Sparrows have the capability of multiple breeding behaviors. We reject the "deception hypothesis" (von Haartman 1951, 1956; Alatalo et al. 1981; Hanley et al. 2007), i.e., the mating status of a polygynous male is unknown to the females mating with him. First, the hypothesis specifies the males are polyterritorial, a behavior we have not observed. Second, the proximity of nests in cases A and B (17.5 and 19 m,

respectively) suggest that both females knew they were mated to the same male. It is possible the females were unaware of each other and of the polygynous behavior of the shared male at the nests that were .