Leks, Sex, and Buff-breasted Sandpipers

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BUFF-BREASTED SANDPIPERS (*Tryngites subruficollis*) reach the Alaskan and Canadian arctic each summer in late May and early June, flying north to breed from their wintering grounds on the Argentine Pampas. This sandpiper is one in a handful of species in North America that breed on leks. In this unusual mating system the males defend small territories clumped tightly together on an area for display, the lek. Females visit the lek as they choose their mates, but after mating have nothing else to do with the males for the rest of the breeding season. The males' parental role ends with copulation. In fact, males depart from the breeding area long before eggs hatch, leaving for females all of the responsibility of incubation and raising young.

Activity on a Buff-breasted Sandpiper lek is hot and heavy during the breeding season. One lek may have 4 to 10 or more resident males holding territories. When females visit during the first few weeks of June the whole lek erupts into motion, the males flashing their white underwings against the tundra's brown background. Male Buff-breasted Sandpiper displays all revolve around these brilliant wing linings. The display sequence often begins when a male raises one of its wings vertically in a single-wing up display (cover photo). As females draw near, the male's activity becomes frantic. He exaggerates the single-wing up by keeling over, pointing his wing undersurface toward the sky, or alternatively by cocking his tail (Fig. 1). These displays blend into double-wing raises or flutter-jumps, in which the male jerks both wings abruptly downward after holding them aloft, and then flutters spasmodically a few feet off the ground (Fig 3). The males also use a more elaborate posture in which they stand erect and hold their wings in a parabola, as if to create a reflecting surface on which to focus the sun's light (Fig. 2). All of these actions serve to make a male conspicuous to other sandpipers, advertise his position on the lek to potential mates, and possibly also to communicate to rival males his presence on the lek.

Once a female lands on a territory the male leads her to his copulation site, a secluded spot — if such a thing exists on the tundra — usually in a low patch of willows. He begins by running away from her just after she lands, an action which seems a bit odd given all the energy he has spent in attracting her to the area. But as he runs away, she follows. She may trail him for 50 meters or more before reaching the willow patch. While he runs he sometimes flashes a single-wing up, or erects his back-feathers in an awkward cowlick (Fig. 4).

FREQUENTLY SEVERAL FEMALES will arrive at the copulation post together, When they reach the site, the male begins the final stages of precopulatory display with a round of double-wing embraces (Figs. 2 and 5). The females rise into his embrace and gather within the arc of his wings, inspecting the white undersurface (Fig. 5). At times they are so close to his wings that they seem to be pecking the fine mottling on his primary underwing coverts. But in the midst of this display he often breaks off and flies abruptly out and around the border of his territory. As the male patrols, the females wait quietly beside the copulation site. Display resumes upon his return, until after a series of embraces and patrols, a female takes the next step by spreading her wings. This seems to be the final stage before copulation (Fig. 6).

All of this display keeps activity levels high around the lek. A great deal of the excitement on the tundra, however, is not sex but instead is violence. Neighboring males, lek residents in their own right, often attempt to disrupt the displays of a male who has female visitors. These intruders strike when their neighbor has a female(s) but they are without. They lurk around the outside edge of the willow patch surrounding a male's copulation site until he reaches the final stages of precopulatory display. Then they burst in on the pair, chasing the female away. Very often the female will then follow the disrupting male back to his own territory. When that happens, the victim sometimes switches roles and immediately goes to disrupt the victor's interactions with his new female.

The displays of these sandpipers have been described before by several arctic fieldworkers (Sutton 1967, Prevett and Barr 1976; Oring 1964, Myers in press) Only within the last few years, however, has the unusual nature of their breeding system become apparent (Pitelka *et al*, 1974). This uniqueness goes beyond the mere fact of their lekking behavior First, these sandpipers are virtually plumage monomorphic, with males indistinguishable by color in the field Just the opposite usually characterizes a lekking species: the males are showy and contrast sharply from female coloration (Gilliard 1963, Hjorth 1970, Foster 1977). Second, Buff-breasted Sandpiper leks are large. Their territories range in size from under 1 hectare to over 4 hectares, and moreover territories expand in size during the breeding season. The territories of other lekking species are often only a few meters in diameter (Hogan-Warburg 1966, Hjorth 1970).

Third, there is the high frequency of disruption. Such behavior is not unique to specific Buff-breasted Sandpiper leks reports from several breeding areas in the arctic indicate that disruption is the rule (F. A. Pitelka and S. G. Jones, pers comm.). Disruptions occur in other lekking species as well, for example in the Greater Prairie Chicken (Hamerstrom and Hamerstrom 1960) and the Great Snipe of Europe (Lemnall 1978) but they are not common in most (*e.g.*, Hogan-Warburg 1966, Hjorth 1970, Stiles and Wolf 1979).

THE ADAPTIVE SIGNIFICANCE of combining these unusual features in a single species remains to be determined, but it is likely they are interrelated. One possibility is that the male's similarity to a female is part of a "sneaky male" breeding tactic, allowing resident males

on a lek to either behave normally and display or to sneak onto their neighbors' territories if they cannot attract visitors themselves. The large size of the territories would then be a defense tactic designed to make disruption more difficult. Whether this hypothesis holds true, or whether something even more bizarre lies behind the leks of Buff-breasted Sandpipers, remains to be learned. Only more research in the arctic will tell.

Acknowledgements

I gratefully thank Frank Pitelka for stirring and supporting my interests in arctic sandpiper ecology and behavior. J. Evens, W. D. Shuford and C. S. Swarth provided able assistance in the field. The Naval Arctic Research Laboratory provided logistic support.

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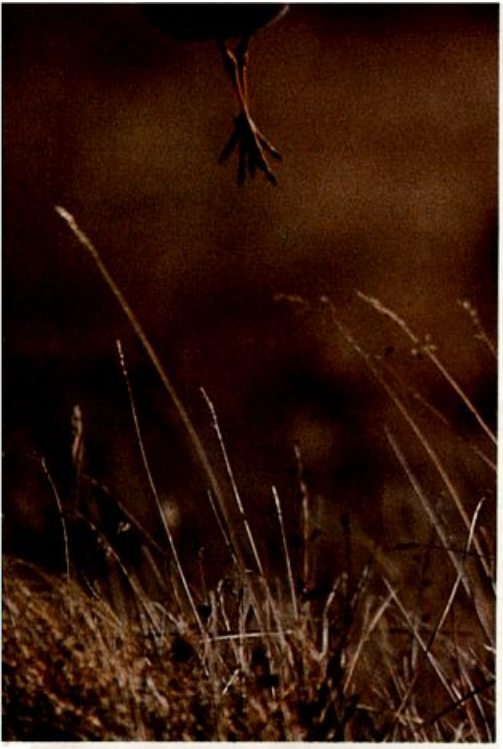
COVER. A male Buff-breasted Sandpiper displaying on his territory in a lek along the Meade River in arctic Alaska. This single-wing up display is part of the ritual used by these males to attract females to their copulation site.

1. An extreme form of the single wing-up display by a Buff-breasted Sandpiper. This posture is usually reserved for females in view or flying by, on the male's own territory, or on that of his neighbor.

2. A double-wing embrace by a male near his copulation site. As the male holds his wings out in a parabolic cup, he begins to march in place and suddenly jerks his head back vertically. Throughout the sequence he is making a quiet ticking sound.



3. Not a Nureyev, this Buff-breasted Sandpiper male is high in a flutter jump. Attempts to photograph this display more often than not record nothing but the bare tundra.

4. A male leads visiting females to his copulation site by running away from them, lifting the central feathers on his back.

5. Females crowd in front of a male as he gives a double-wing embrace display while standing on his copulation site. This is the main precopulatory display, and also the one position most vulnerable to attacks by intruding disrupting males.

6. Copulation. Both the male and female have their wings spread as a third, interested female looks on.