

Wilson Bull., 96(4), 1984, pp. 720–723

Observations on postures and movements of non-breeding American Woodcock.—Apart from descriptions of male courtship displays, there are few reports on the behavior of American Woodcock (*Scolopax minor*). This paper describes postures and movements of non-breeding birds observed in late summer and early spring.

Observations through a night vision scope on crepuscular concentrations of woodcock at logging road puddles were made from June–September of 1972 and 1973 in the Cloquet Forestry Center (CFC) in northeastern Minnesota (Morgenweck, Ph.D. diss., Univ. Minnesota, St. Paul, Minnesota, 1978). Woodcock activities and social interactions were described and quantified. Sex determinations were made if the bird was marked (Morgenweck and Marshall, *Bird-Banding* 48:224–227, 1977), on the basis of size and/or peenting. Drawings were made from photos taken through the night vision scope. Other observations of a single bird were made during daylight in St. Paul, Minnesota, over 8.75 h on 4 April 1974 and between 29 March and 1 April 1978 (Marshall, *Auk* 99:191–192, 1982).

Postures.—*Alert.*—At CFC, woodcock usually landed in the road some distance from the puddle and, while standing upright and motionless, appeared watchful (Fig. 1A). The percent of birds that assumed alert posture upon landing and the duration of this posture was not significantly different between dawn and dusk (Table 1).

At intervals during feeding, a St. Paul bird stood motionless, eyes open, with the bill on the breast. The undisturbed bird assumed this posture eight times, ranging from 0.5–9 min in length. Also, gray squirrels (*Sciurus carolinensis*) or cottontails (*Sylvilagus floridanus*) passing nearby elicited this posture on seven occasions for 1–10 min. Demole (*Stutilites de la Chasse à la Bécasse*, Librairie Des Champs-Élysées, 1964) described this posture by European woodcock (*Scolopax rusticola*) upon arrival at a pool prior to an evening bath.

Stand rest.—Five times, after it had been in the alert position for a few seconds, a St. Paul bird quickly turned its head and tucked the bill under the dorsal feathers with the eyes closed. These postures lasted 3–26 min.

Rest.—On three occasions a St. Paul bird, while on leaf litter under shrubs, fluffed its ventral feathers and lowered its body to the ground with vigorous side-to-side motions that displaced dry leaves. The tail was lifted, but not spread over the back; the bill was placed in the dorsal feathers; and the eyes were closed. These periods lasted 4–9 min.

Tail flare.—At CFC, an interruption (e.g., when an automobile approached or another woodcock flew overhead) often elicited a tail flare response (Fig. 1B) by both sexes (Table 2). We agree with Sheldon (*The Book of the American Woodcock*, Univ. Massachusetts Press, Amherst, Massachusetts, 1967) that tail flares are elicited by alarm.

Movements.—*Stitching.*—At CFC, woodcock made repeated probes in the sand and mud of the road, the bill rarely inserted more than 1 cm into the substrate (Fig. 1C). There was no evidence of prey capture, and usually the birds only hesitated to jab as they moved toward a puddle. After reaching the puddle, the birds thrust their bills deeply into soft mud.

Birds then walked into puddles until the water was nearly to the belly feathers, hesitated, then made a series of rapid jabs into the substrate with the bill at an angle of 70–80° below the horizontal. After making one to six jabs, usually with the bill remaining in the water, the bird walked a few steps and repeated the process. On other occasions a woodcock would walk in a zig-zag pattern through the puddle, making jabs at the substrate, and lifting its bill clear of the water between jabs. The percent of birds that stitched and the duration of stitching was not significantly different between dawn and dusk (Table 1). Stitching may be a type of displacement activity (Welty, *The Life of Birds*, W. B. Saunders Co., Philadelphia and London, 1962).

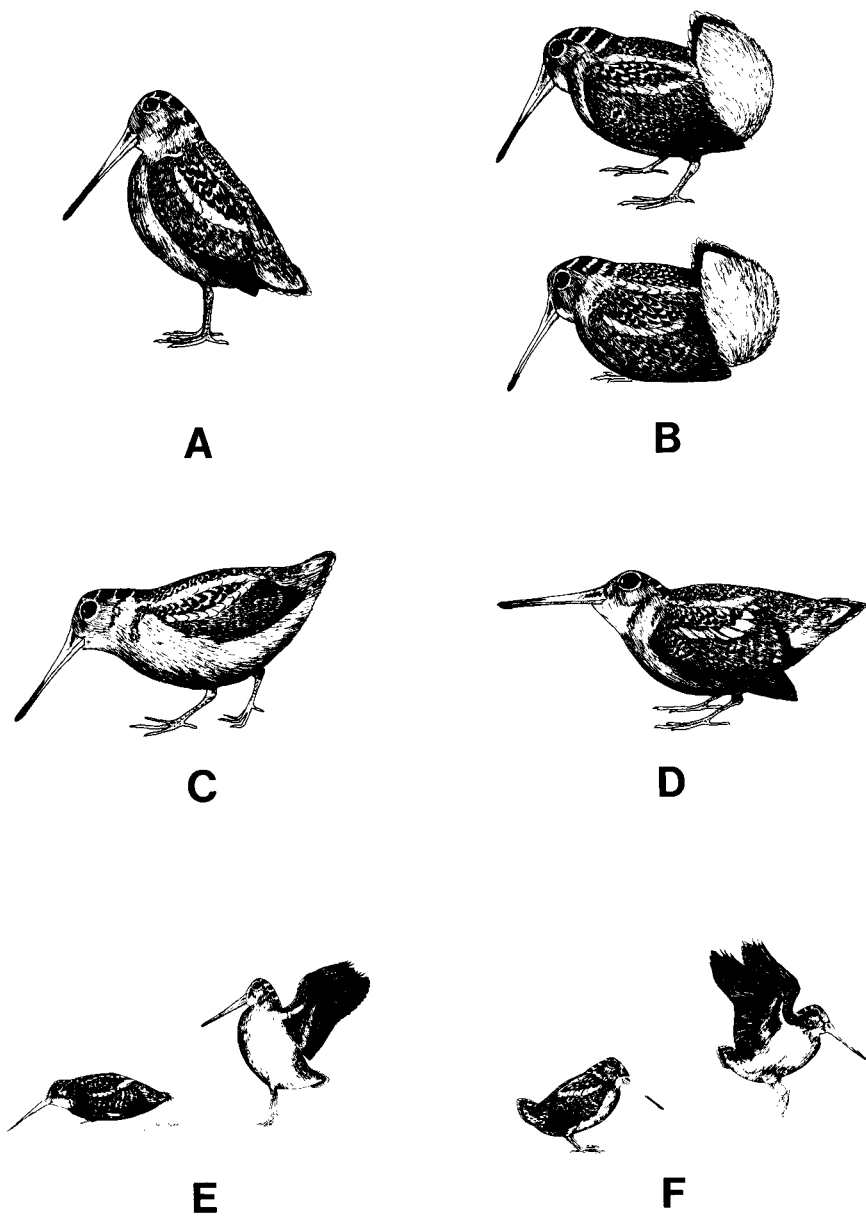


FIG. 1. American Woodcock postures: A. Alert; B. Tail flare; C. Stitching; D. Supplanting chase; E. "V" chase; F. Flutter leap.

TABLE 1
NUMBER AND PERCENT OF AMERICAN WOODCOCK OBSERVED PARTICIPATING AND AVERAGE
MIN PER BOUT IN FOUR ACTIVITIES—COMPARING DAWN AND DUSK PERIODS^a

	% participating dawn/dusk	(N) dawn/dusk	\bar{x} /bout dawn/dusk	(N) dawn/dusk
Alert	83/69	36/96	1.5/1.2	13/39
Stitching	85/83	41/118	2.5/3.5	10/40
Bathing	20/71*	35/129	2.5/2.5	2/47
Preening	29/78*	31/74	2.7/3.6	5/40

^a The number of birds observed participating is greater than the number of birds timed, because it was impossible to time each individual's activity when several birds were present.

* Differences significant ($P < 0.05$).

Feeding.—While rocking on the lawn the 1978 bird both picked up and probed for worms. Also, while under nearby shrubs, the bird turned dead leaves up and to the side with its bill—a few times it used a foot to flick a leaf over, but not in a “scratching” motion. Often the bird reached out quickly to catch something or poked its bill into a rosette of green leaves followed by swallowing. Wilson, (American Ornithology, 6:104–108, Bradford and Inskip, Philadelphia, Pennsylvania, 1812) noted that “woodcocks will turn over leaves in search of food.”

Bathing.—After stitching, the CFC birds walked deeper into the puddle and bathed in a manner described by Slessers (Auk 87:91–99, 1970). More birds bathed at dusk ($\chi^2 = 27.18$, $df = 1$, $P \leq 0.05$) than at dawn, but there was no difference in the duration of these bouts (Table 1). Similar behavior by the European woodcock has been reported by Demole (1964).

Preening.—After bathing, CFC woodcock walked to the edge of the puddle and preened, removing feather sheathing and feathers. More birds preened in the evening ($\chi^2 = 20.95$, $df = 1$, $P \leq 0.05$) than in the morning with no difference in the duration of the bouts (Table 1). Preening peaked in early August which coincides with the peak of molting as reported by Owen and Krohn (Wilson Bull. 85:31–41, 1973).

Supplanting chases.—At CFC, these chases often began after preening (Fig. 1D). A chase

TABLE 2
PERCENT OF WOODCOCK OF KNOWN SEX PARTICIPATING IN FOUR ACTIVITIES

	Male		Female	
	%	N	%	N
Tail flare	21	34	25	20
“V” chases	51	35	54	24
pursuer	89*	18	15	13
pursued	11*		85	
Arc flight	34	35	52	21
Flutter leap	41	34	50	16

* Significant at $P < 0.05$.

occurred when a bird lowered its head and bill to the horizontal and, with wings held slightly away from the body, charged another bird forcing it to run or fly.

"V" chases.—A more common chase resulted when one bird approached another with outspread wings lifted high in a "V" (Fig. 1E). The pursued bird squatted as the pursuer approached to within 0.5 m, but when the pursuer closed to within 25 cm, the pursued bird rose and walked rapidly away. Occasionally this sequence was repeated several times. On other occasions the pursued bird either ran or flew without squatting and, on three occasions the pursuing bird attempted to mount.

The percent of males (51%) and females (54%) participating in "V" chasing was similar. Significantly more males were pursuers (Table 2), and pursued females most often squatted while being approached, whereas pursued males moved away. These encounters may be adolescent sexual displays because Sheldon (1967) described similar behavior preceding copulation and most birds at puddles (79.1%) were hatching year individuals, based on mist net captures. Also, no marked adults participated in the "V" chases. Since Sheldon (1967) reports similar behavior by a male attempting to copulate on a singing ground, these encounters could be adolescent sexual displays.

Arc flight.—At CFC, after alert posture, birds farthest from the puddle often moved closer by flying in a low "arc flight" which was usually less than 15 m long. The percent of males and females performing arc flights was not significantly different (Table 2).

Flutter leap.—At CFC, woodcock often leaped 5–30 cm into the air, fluttered their wings and returned to the same place on the ground (Fig. 1F). Over 91% of those recorded were from the alert position, although flutter leaps also occurred from the squatting or tail flare position. Flutter leaps were performed by 41% of the observed males and 50% of the females (Table 2).

Frequently, pursued woodcock would flutter leap when approached by another bird, and the pursuer would follow suit. There may be a relationship between flutter leaps and precopulatory behavior, as discussed by Sheldon (1967). Flutter leaps, after preening, may have aided in restoring plumage to its proper position. On a few occasions, a bird, stitching near a puddle, would flutter leap. A flutter leap was seen once in St. Paul when a cottontail rushed to within 1 m of the bird.

Acknowledgments.—The facilities of the Cloquet Forestry Station were made available by A. R. Hallgren, and G. W. Gullion assisted in many ways. M. K. Beutlich gave much support and frequent field assistance. N. Kane made the drawings for the figures. Financial support was provided by the Research Program for Migratory Shore and Upland Game Birds, U.S. Fish and Wildlife Service, Contract #14-16-008-52F, through the Minnesota Department of Natural Resources. F. B. McKinney and H. B. Tordoff reviewed the manuscript.—RALPH O. MORGENWECK, *Div. Biological Services, U.S. Fish and Wildlife Service, Fort Collins, Colorado 80526*; AND WILLIAM H. MARSHALL, *7248 Oakmont Dr., Santa Rosa, California 95405. Accepted 28 Aug. 1984.*

Wilson Bull., 96(4), 1984, pp. 723–725

Non-territorial adult males and breeding densities of Blue Grouse.—Although it previously was believed that all adult male Blue Grouse (*Dendragapus obscurus*) held territories during the breeding season (Zwicker, *J. Wildl. Manage.* 36:1141–1152, 1972), recent studies have shown that non-territorial adult (≥ 2 years of age) males were present in populations in coastal British Columbia (Lewis and Zwicker, *Can. J. Zool.* 58:1417–1423, 1980; Jamieson and Zwicker, *Auk* 100:653–657, 1983). Non-territorial males are physiologically able to breed (Hannon et al., *Can. J. Zool.* 57:1283–1289, 1979), yet in the absence of occupying