WING MARKER FOR AMERICAN WOODCOCK

By Ralph O. Morgenweck and William H. Marshall

During the summers of 1973 and 1974, studies of the behavior of the American Woodcock (*Philohela minor*) were undertaken at the University of Minnesota, Cloquet Forestry Center. Objectives were to describe and quantify activities and behavior of Woodcock at crepuscular concentration sites (Morgenweck, 1974). Birds were captured in mist nets and each was banded with U. S. Fish and Wildlife Service leg bands. To recognize individual birds using a Night Vision Sight, it was necessary to mark them according to age and sex.

Woodcock neck collars (McCabe, 1975, pers. comm.) were not used because we felt the rubber band collars might deteriorate too quickly or become fouled in the vegetation. Neck tags (Westfall and Weeden, 1956) were not used because they required a metal clip through the skin, thus possibly influencing behavior or survival.

The markers used were adapted from an arrow-shaped wing marker (Cutright, 1973) and were applied to the humerus as reported by Hewitt and Austin-Smith (1966). They were made of "Saflag" material from the Safety Flag Company of America, Pawtucket, Rhode Island. In 1973, they were "Rocket Red" with white symbols while in 1974, they were white with "Rocket Red" symbols. The markers weighed less than 1 g and were 93 mm long with a rectangle (27 × 30 mm) at one end and an "arrowhead" at the other (Fig. 1). Symbols on the rectangle designating age class (Martin, 1964) were smaller rectangles 27 × 12 mm and a circle 22 mm in diameter. Sex was indicated by placing markers on the left wing of males and on the right wing of females.

Symbols were fixed to the marker by applying a very thin coat of Goodyear Pliobond general purpose adhesive to both surfaces, allowing both to dry until tacky, then applying a second thin layer and pressing the surfaces together. A blunt instrument was used to apply pressure, eliminating air spaces. Symbols were applied to both sides of the marker and dried in about one half hour. Markers were prefabricated in the laboratory.

One person can apply the marker by holding the Woodcock belly-down in his lap with the palm of one hand on its back. One wing is held outstretched with the index and middle finger of the hand holding the bird while the other hand passes the arrowhead forward around the humerus, between the tertiaries, until it encircles the wing. The arrowhead is then inserted through a small slit in the marker to secure it. Care must be taken not to apply markers too tightly or the skin may become calloused. When the

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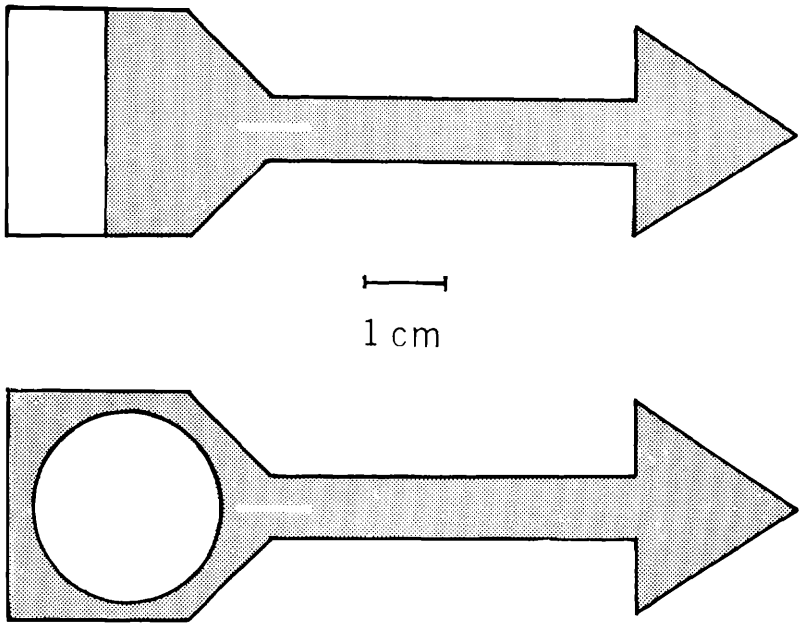

FIGURE 1. Woodcock wing markers indicating hatching-year (top) and adult (bottom) birds.

wing is outstretched, it is judged a proper fit if the marker does not significantly constrict the skin over the humerus. Also, feathers should be smoothed back into place. Markers remained atop the wing and did not revolve to the underside.

The high color contrast of these markers was easily detectable on Woodcock through the Night Vision Sight. When a bird flew close to the observer a "patter" made by the marker could be heard although the marker could not be seen. There was no apparent hindrance to flight. Although markers were occasionally observed in daylight when the bird was flying, they did not seem to make birds on the ground more conspicuous. Birds were often flushed within four meters of the observer and only rarely were they first observed on the ground. When they were, the bird's movement usually attracted attention first.

Seventy-one birds were wing marked in 1973, and an additional 11 in 1974.

No instances of lost symbols were recorded under field conditions. All birds recaptured during the four-months field season following initiation of marking in 1973 still retained the wing marker (n = 12). Two of the birds banded and wing-marked in 1973 were recaptured in the spring of 1974; one retained the marker with symbols whereas the other had lost the marker. Another 1973 bird was recaptured late in the summer of 1974 and a fourth was shot near the study area in September 1974; both retained the markers with symbols.

Undoubtedly, all four had migrated, presumably to the southern United States and back, because other Woodcock banded at Cloquet have been recovered in Missouri, Arkansas, and Louisiana.

In 1974, three wing marked birds were observed by hunters near the Forestry Center and one marked bird was shot. The wing markers had been carried by these birds for a minimum of 64 days.

Examination of the two markers recovered after 10 and 12 months showed little wear although the plastic surface had become brittle at flex points. The marker recovered after 15 months was quite worn at flex points; however, the nylon fabric held it together. Recaptured wing-marked birds and autopsy of two hunter-killed birds showed feather wear was minimal and that there was no abrasion of the humeral skin.

The susceptability to recapture of 53 birds only banded vs 71 both banded and wing marked, was tested by a Chi-square test (Snedecor and Cochran, 1967). The results showed no significant difference ($P > 0.05$) between the two groups (Table 1). The results

TABLE 1.

Number of Woodcocks marked and recaptured.

		Recaptured			
	Banded only	Same season		Following year	
	n	n	(%)	n	(%)
1973	53	8	(15.1)[1]	3	(5.7)
1974	16	1	(6.3)		
	Band and wing marker				
1973	71	12	(16.9)[1]	3	(4.2)
1974	11	0	(0.0)		

[1]Difference between the percent of recaptures for the two systems, adjusted for amount of recapture effort in each, is not significant ($\chi^2 = 2.34$, d.f. = 1, $P > 0.05$).

were weighed to account for differences in amounts of recapture effort (number of mist net nights between first capture and recapture) and all data were for single recaptures to eliminate bias of repeatedly trapped birds. The sample sizes of birds marked and recaptured in 1974 were too small to test in a similar manner.

Examination of the data for 1973 birds shows similar percentages recaptured in 1974—banded only 5.7 percent (n = 3) vs banded with wing markers 4.2 percent (n = 3). The sample size was too small to comment on differences in vulnerability to hunting; however, it is of interest that three wing-marked birds have been reported taken by hunters while one banded-only bird has been reported. This may be due in part to the curiosity aroused in hunters when a wing-marked bird is taken.

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