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1992

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Nesbitt, Stephen A.; Bjork, Robin D.; Williams, Kathleen S.; Schwikert, Stephen T.; and Wenner, Anne S., "AN INDIVIDUALIZED MARKING SCHEME FOR SANDHILL CRANES AND ITS USE TO DETERMINE FALL MIGRATION INTERVAL" (1992).

North American Crane Workshop Proceedings. 317.

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AN INDIVIDUALIZED MARKING SCHEME FOR SANDHILL CRANES AND ITS USE TO DETERMINE FALL MIGRATION INTERVAL

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Abstract: A color-band based marking scheme was used for individually marking sandhill cranes in Florida. The band-loss rate was 2.8% per year between 1977 and 1988. Band loss was greatest on bands placed below the ankle joint and occurred most frequently during years 2 to 5. Color-marked individuals monitored during fall migration averaged 6.2 days ($n=5-13$ days) between the Jasper-Pulaski Fish and Wildlife area in northwestern Indiana and wintering areas in northern Florida.

Proc. 1988 N. Am. Crane Workshop

The distinctive marking and subsequent observation of individual animals has been a standard tool for wildlife study (Trippensee 1941; Balham and Elder 1953; Knowlton et al. 1964). We report here on an application and the persistence of an individual color marking scheme for sandhill cranes. In 1974, we began individually marking Florida sandhill cranes (*Grus canadensis pratensis*) captured in northern Florida with a distinctive combination of colored leg bands. This marking scheme was expanded in 1977 to include greater sandhill cranes (*G. c. tabida*) wintering in Florida.

METHODS

In addition to the U.S. Fish and Wildlife Service sequentially numbered metal leg bands, each bird was banded with 2 to 5 wrap-around, colored plastic (Darvec) leg bands. The birds were banded on either or both legs, above and/or below the intertarsal (ankle) joint. Bands in 5 colors (blue, green, red, white, and yellow) obtained from J. Warner (Observatory Cottage, Potters Bank, Durham City, England, DH 13RR) were used. After being applied, the bands were sealed with P.V.C. cement. Through retrapping, band returns, or by reading the numbered bands in the field, a comparison of the number of birds with intact

combinations and those that had lost bands (band-loss rate) was possible.

Individual band combination sequences were recorded beginning with the upper left (UL) position and proceed clockwise to lower left:

UL	UR
LL	LR

Records of initial capture, band number, color combination, sex (when known), subspecies (when known), date and location of all subsequent sightings were kept for each individual on 5"x 8" index cards.

Observations were made with several types of telescopes: Bushnell Spacemaster (25X), Bausch and Lomb (25X), and Mead (15-60X) refracting telescopes, as well as a Celestron C8 and Questar Field model reflecting telescope both with 50 and 80X interchangeable eye pieces. To rectify the reversed imaging inherent in the reflecting scopes, both were equipped with a porro prism. The use of a quality tripod and a fluid-dampened pan head improved the performance of the more powerful telescopes.

Under usual circumstances, cranes migrate by day (starting mid-morning [Nesbitt 1975]) and stopover each night (Crete & Toepfer 1978; Ander-

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son et al. 1980; Melvin & Temple 1981). They may remain on the ground at these stop-overs during periods of bad weather (Melvin & Temple 1981). The migration route for the population of greater sandhill cranes that winters in Florida has been well documented (Anderson et al. 1980; McMillen et al. in press; Melvin & Temple 1981; Nesbitt & Williams 1979; Toepfer & Crete 1979). The Jasper-Pulaski (J-P) Fish and Wildlife Area in northwestern Indiana is the traditional stopover used by a majority of the sandhill cranes migrating between the Great Lakes region and winter areas in Florida (Melvin & Temple 1981; Shroufe 1976). Cranes stop over at J-P for varying lengths of time and are easily observed while feeding in agricultural fields and at pre-roost gatherings. During a portion of the fall migration of 1983-1986, we observed cranes at J-P on a daily basis. Simultaneously, the arrival of birds at major wintering areas was being monitored in North Florida, approximately 1350 km south. Some individuals were seen daily during the fall at J-P and again after arrival in Florida. The time between when a bird was last seen at J-P and first seen in Florida was the estimated migration interval.

RESULTS

Band loss

From 1974 through 1988, 789 sandhill cranes were individually color-marked, 34.2% Florida and 65.8% greater sandhill cranes. Most (76%) were resighted at least once, 6 months or more subsequent to initial capture. Twenty-four marked individuals were seen 10 years or more after initial capture and color-marking.

Average band-loss rate for years 1-7 was 2.8% per year, with most of the loss occurring during years 2-5 (Table 1). Band-loss rate dropped to 0.5% after year 5 and to 0.0% after year 6. Band loss, which included USF&WS bands as well as the plastic bands, was most likely to occur with bands below the intertarsal joint, only 9% of the total loss occurred with bands above the joint.

Fall migration

The first fall arrival of greater sandhill cranes to north Florida wintering areas usually occurred during the last week in October or the first week in November (Table 2). The mean earliest arrival date was 31 October. Numbers of cranes have been seen moving south at altitudes ≥ 300 m until 15-28

December, so the last arrival of new fall migrants probably occurs during mid- to late December.

Sixteen greater sandhill cranes were seen regularly prior to departure from J-P and again after arrival in Florida, (6 males, 4 females, 6 unknown). We only considered birds that were marked in all 4 positions to avoid any possibility of error due to band loss.

DISCUSSION AND RECOMMENDATIONS

The mean interval between sightings in J-P and Florida was 6.2 days, the minimum 5 days, and the maximum 13 days (Figure 1). Six and 7 days were the most frequent intervals. The mean interval we observed for cranes migrating between J-P and northern Florida was consistent with the mean fall flight distance travelled per migration day ($267 \text{ km} \pm 153$ [SD]) reported by Melvin and Temple (1981) from their own and other studies. If cranes consistently travel at the mean daily rate (267 km/day , [Melvin & Temple 1981]), they would accomplish the J-P to Florida trip in 5.1 migration days. At the maximum rate (740 km/day [Melvin & Temple 1981]), they would complete the trip in 1.8 migration days. At the mean rate $+1$ SD, they would complete the trip in 3.2 migration days, and at the mean rate -1 SD, they would complete the trip in 11.81 migration days. At the minimum (48 km/day) rate reported by Melvin & Temple (1981), the trip would be accomplished in 28.1 migration days.

Under continued optimal conditions, cranes would be able to cover the distance between J-P and Florida in less than 5 days. However, variations in fall weather conditions would make this unusual. Spring migration might proceed more rapidly due to the greater likelihood of prolonged, favorable weather conditions in the spring and a difference in underlying motivation for migration (Farner 1955). In the spring, cranes are returning to a nesting or natal area rather than migrating from an unfavorable environment as they are in the fall. The cranes do not congregate at J-P in the spring in the same numbers that they do in the fall, making spring interval calculations more difficult.

Marking systems dependent on wing tags, neck collars, leg bands, etc., that incorporate an alphanumeric code are difficult to read under less than ideal field conditions or at distances beyond a few hundred meters. Also, within a few months, some markers would become so faded, worn, or dirtied as to be unidentifiable. A four-position color marking scheme resulted in a large number of individu-

ally marked cranes quickly and easily identified in the field. The primary drawback is that bands in the low position sometimes were difficult to see in the field when vegetation obscured the birds' feet. However, if birds are actively feeding or walking, the lower bands eventually are revealed. **Banding in high positions only would increase ease and speed of band-reading and decrease band-loss rate, but substantially limits the number of possible combinations.** If it is necessary to individually mark only a few individuals, **banding only the high positions would be preferable.**

Stacking of multiple bands in one position would be one way to introduce new combinations to a high position only marking scheme. But when we tried stacking bands they tended to slip into one another. We reduced this problem by **separating 2 color bands with a lock-on USF&WS band,** the flange of the lock-on band preventing them from slipping together.

Our use of several colors concurrently would not preclude other researchers from using similar colors. There were at least 5 other ongoing research projects using color banding to identify individual cranes in eastern North America. Some colors were used simultaneously by separate studies, but materials, combinations, and sizes varied and each researcher's combinations were easily distinguished.

Quality optics were important to the success of our individualized marking system, in addition to observers being familiar with the particular system and its components. The widely used 20-25X field scope was satisfactory only at moderate distances and under ideal light conditions. A more powerful scope with better resolution, color correction, and light gathering capabilities produced results under less than ideal conditions. Color bands could be identified at 1.5 km with the Celestron or Questar scope even when lighting conditions were poor.

The multiple color banding system initiated in 1974 proved satisfactory for our needs. Though some band loss occurred, it was not excessive nor did it prevent us from obtaining a large number of multi-year observations of many individuals. As others have reported (Williams 1981, Hoffman 1985) we observed no adverse effect on survival or behavior from color-banding cranes.

LITERATURE CITED

- Anderson, R.K., D.K. Jansen & T. Cogger. 1980. Fall and spring migration routes and behavior of eastern greater sandhill cranes: 1978-1979. U.S. Fish & Wildl. Serv., 21p.
- Balham, R.W. & W.H. Elder. 1953. Colored leg bands for waterfowl. *J. Wildl. Manage.* 17:446-449.
- Crete, R.A. & J.E. Toepfer. 1978. Migration of radio-tagged eastern greater sandhill cranes. U.S. Fish & Wildl. Serv. Rept., 41p.
- Farner, D.S. 1955. The annual stimulus for migration: experimental and physiologic aspects. Pp. 198-237 in A. Wolfson (ed.), *Recent Studies Avian Biol.*, Univ. Ill. Press, Urbana.
- Hoffman, R.H. 1985. An evaluation of banding sandhill cranes with colored leg bands. *N. Am. Bird Bander* 10:46-49.
- Knowlton, F.F., E.D. Michael & W.C. Glazener. 1964. A marking technique for field recognition of individual turkeys and deer. *J. Wildl. Manage.* 28:167-170.
- McMillen, J.L., R.D. Urbanek & T.A. Bookhout. In press. Autumn migration of greater sandhill cranes from upper Michigan, U.S.A. in J. Harris (ed.), *Proc. 1987 Int. Crane Workshop*, Int. Crane Found.
- Melvin, S.M. & S.A. Temple. 1981. Migration ecology of sandhill cranes: a review. Pp. 73-87 in J.C. Lewis (ed.), *Proc. 1981 Crane Workshop*, Natl. Audubon Soc.
- Nesbitt, S.A. 1975. Spring migration of sandhill cranes from Florida. *Wilson Bull.* 87:424-426.
- Nesbitt, S.A. & L.E. Williams, Jr. 1979. Summer range and migration routes of Florida wintering greater sandhill cranes. *Wilson Bull.* 91:137-141.
- Shroufe, D.L. 1976. Seasonal migration of sandhill cranes through northwestern Indiana. Pp. 51-58 in J.C. Lewis (ed.), *Proc. Int. Crane Workshop*, Okla. State Univ.
- Toepfer, J.E. & R.A. Crete. 1979. Migration of radio-tagged greater sandhill cranes from Minnesota and Wisconsin. Pp. 159-173 in J.C. Lewis (ed.), *Proc. 1978 Crane Workshop*, Colo. State Univ.
- Trippensee, R.E. 1941. A new type of bird and mammal marker. *J. Wildl. Manage.* 5:120-124.
- Williams, L.E., Jr. 1981. Capturing and marking sandhill cranes. Pp. 175-179 in J.C. Lewis & H. Masatomi (eds.), *Crane Res. Around the World*, Int. Crane Found., Baraboo, Wis.

Table 1. Band loss among cranes color banded in Florida: 1974 through 1986.

Years of contact	Number of banded birds encountered	Loss occurring during the interval (%)	Total losses rate since banding (ib)
1-2	245	3.2	3.2
2-3	185	4.3	6.5
3-4	141	4.3	9.0
4-5	98	6.1	11.4
5-6	58	1.7	11.8
6-7	32	0.0	11.8
7-12	12	0.0	11.8

Table 2. Earliest fall arrivals of greater sandhill cranes* at north Florida wintering areas.

Year	Date
1981	1 November
1982	11 November
1983	1 November
1984	27 October
1985	6 November
1986	1 November
1987	23 October
1988	19 October

**Birds sighted in Great Lakes Area subsequent to capture and color-marking in Florida.*

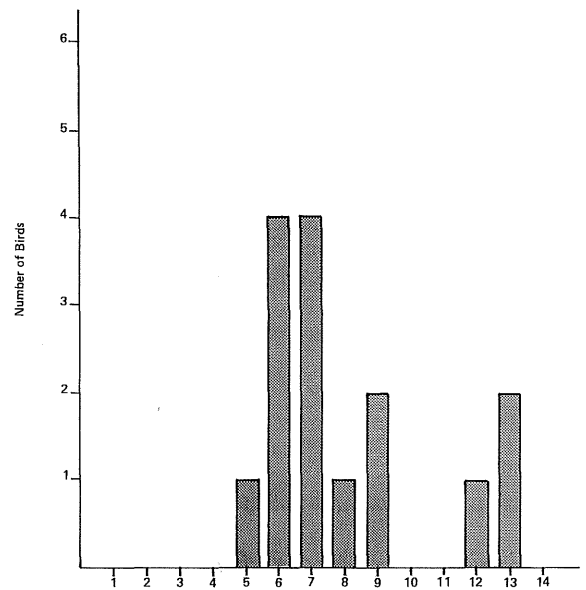


Figure 1. Migration interval (days) between J-P and north Florida wintering areas.