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MOUNTAIN PLOVER REINTRODUCTION IN KANSAS

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The Mountain Plover (*Eupoda montana*) is a common summer resident in the shortgrass prairies of eastern Colorado. The stronghold of this population during the summer is at the Pawnee National Grasslands of northeastern Colorado (Graul 1976). Up through the early 1900's, wintering populations in Texas and California extended their spring migration to include the prairies of western Kansas (Allen 1872, Goss 1891, Menke 1894, Snow 1903, Long 1940, Rising 1974). Due to changing agricultural practices and climatic hardship, however, populations ceased their migration in Kansas by the mid-1900's (Tordoff 1956). Breeding populations remained adequate in Colorado throughout the 1900's for expansion into Kansas, but the plovers failed to relocate (Graul, per. comm.).

During the summer of 1982, 50 Mountain Plovers were reintroduced into western Kansas through cooperative efforts between Kansas and Colorado Fish and Game Commissions. Shortgrass prairie northeast of Sharon Springs in Wallace County, Kansas was selected as the release site for this experimental program (Fisher 1982).

Materials and Methods

All of the Mountain Plovers transplanted into Kansas were captured and banded at the Pawnee National Grasslands by the Colorado Fish and Game Commission. The plovers were then transported into Kansas after their feathers had developed sufficiently to allow for normal thermoregulation and near flight capabilities. All release sites were within a 5 km radius of Mrs. George Harrison's ranch (T-11, R-38, S-34).

Two procedures were utilized for the reintroduction. The first method involved confining the plovers in a five foot high mesh wire fence. This structure enclosed a 40 ft² area of pasture with less than two degrees slope. Mealworms plus catfood were provided to supplement the diet of invertebrates obtainable inside the pen. After a brief acclimation period within the pen (24 hrs to 2.5 days) all birds were released. The second procedure abandoned the method of retaining the plovers for any length of time. Instead, new arrivals were divided into small groups of three or four birds, based on similar primary and secondary feather development, and released in various habitats on the day they were received.

Study Area

The release sites were encompassed by 580 km² of grassland with large tracts having less than two degrees slope and vegetation height ranging from 4 to 20 cm. Blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*) were the dominant plants in this area, with clumps of midgrass also present. Wheatgrass (*Agropyron smithii*), yucca (*Yucca glauca*), pricklypear cactus (*Opuntia macrorhiza*), nipple cactus (*Coryphantha vivipara*), globemallow (*Sphaeralcea coccinea*), western wallflower (*Erysimum asperum*), and thistle (*Cirsium* sp.) were commonly found associated with these grasses.

Results

Dispersal rates among the plovers released varied. Plovers held captive at the release sites developed an attraction to the area which delayed their rate of dispersal. After being released, these plovers occupied an area within 350 m of the pen for 2 to 13 days before dispersion occurred. They also could easily be approached within a meter without becoming alarmed. Plovers released without a period of confinement were immediately reluctant about being approached. They would forage within 460 m of the release site for only a day and then deserted the area.

Only three plovers could fly when freed. The remaining birds fledged 10-48 hours later. At this point they would begin to wander in small groups. Four plovers were relocated two days after being released 0.5 km from the original release site, while another flock of three plovers moved 1.2 km. One plover traveled 4 km in five days, the longest distance recorded. The majority of these plovers tended to move toward areas barren of vegetation, particularly wheel tracks. Mountain Plovers were often observed foraging along these tracks in the mornings and evenings, and were seen at night sleeping in groups of five within the deepest tracks. Old prairie dog mounds were often used as loafing sites during midday. Roads and barren areas around windmills attracted plovers during evening hours (2030 to 2230).

These plovers were quick to demonstrate defenses against possible predation. They were quite adept at hiding in the grass. Several times Swainson's Hawks (*Buteo swainsoni*) were seen flying over Mountain Plovers without locating them. One plover was even seen to flatten its body to the ground as a dove (*Zenaida macroura*) passed overhead. Skunks were also noted searching areas for plovers unsuccessfully. No predation was evident upon examination of four Burrowing Owl (*Athene cucularia*) nesting holes, but predation did occur at a swift fox (*Vulpes velox*) den. A government band was found at a swift fox den within one day after releasing a group of 19 plovers. Another band was discovered at the same den five days after a similar release of plovers.

Very little intraspecific competition occurred between unconfined plovers, though a distance from 0.5 to 1.8 m was maintained between birds when foraging. Only once was interspecific competition noted. A Horned Lark (*Eremophila alpestris*) attacked one Mountain Plover three times before the plover moved out of its territory.

Conclusion

The success of this project may remain a mystery for several years. Though waterfowl prove to return to the area from which they fledge, it is unknown if other birds will respond in the same manner. Still the Kansas Fish and Game is hopeful and plans to carry on the project for two more years.

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COLOR-MARKING OF PURPLE MARTINS IN BALDWIN CITY, KANSAS

Katharine B. Kelley

I began banding Purple Martins (*Progne subis*) in Baldwin City, Kansas in 1960. Since initiating this project, and with the very capable help of Amelia J. Betts, Dr. Roger Boyd, and Dr. Calvin Cink, I have banded 409 young and 71 nesting adults. Of these, 400 have been color-banded since 1977. In addition to martin houses at my home and Margaret Boyd's, houses at the Craig, Deel, Caruthers, and McMillan residences were used in this study with the appreciated cooperation of these martin landlords.

Methods

In order to band both the young and their parents, two prerequisites must be met. First, the nest compartments in a house must be able to be opened from the front and one at a time. Secondly, the box must be on a telescoping pole so that it can be lowered and raised with minimum disturbance to the birds. Furthermore, the capturing of the birds must be carried out on the darkest night and with the utmost stealth.

During the mid-morning of the day of banding, the martin house was lowered to its minimum height. On the night of banding, my assistants approached the box from opposite sides, staying low, and moving slowly and quietly so that all the openings into the nest compartments could be covered simultaneously. At a given signal, they placed peg-boards over the openings. The birds were then removed an apartment at a time and taken to the banding table where they were measured, sexed if possible, and banded.

After the data were recorded, the family was returned to its own compartment, and a small peg-board was fastened over the entrance to insure that everybody stayed home the rest of that night. This process was repeated until all the occupants in the house were banded. The house was then left in this lowered position, but very early the next morning the peg-boards over the entrances were removed. About mid-morning, after the first feeding was over, the house was again raised to its previous height, taking care that the box was not turned even slightly from its normal position.

We have used two different sizes of nest boxes, some had 12 compartments and others had 24. The houses with 12 compartments were relatively easy to cover during the capturing operation, but those with 24 were not. So in 24 compartment houses we only worked in broad daylight and banded just the nestlings.

Results and Discussion

During the four year period following 1976, 11 birds were recaptured (Table 1). As can be seen in these results, birds do return to the same colony in subsequent years, even returning to the same compartment that was used the previous year. In the early spring of 1980 I found a dead martin on the upper porch of my house. Perhaps its presence frightened away the former resident as three birds moved to the Deel colony that year, and all the birds in my house were new.

Table 1. Recapture of Purple Martins¹

Year	Individual Birds									
1976	x									
1977	x	x	x	x	x	x	x			
1978	x	x	x	x	x ²	x ²	x	x	x	
1979		x ²		x			x	x	x ³	x
1980		x ³		x ³					x	x ³

¹ All birds recaptured at the same colony except as noted.

² Nested in the same nest compartment as previous year.

³ Nested in the Kelley colony the previous year, but moved to the Deel colony.

Brood size varied from one to six with broods of four and five comprising 32% and 28% respectively (Table 2). For unknown reasons the proportion of young with shorter wing feather development was greater in broods of four (Table 3). Some of these young had few or even no feathers erupting at the time of banding. The mean difference in feather development between the young with the longest wing feathers to the young with the shortest among the individuals in a single brood is greatest in broods of six and least in broods of two. A similar pattern was also shown in the range of weights within a particular brood. In broods of two, there was a mean of 4.5 g difference between the largest and the smallest. In broods of three, this mean was 5.6 g. In broods of four the difference was 7.2 g, and in clutches of five the difference was 6 g. In broods of six, however, the difference was 8.6 g. The pattern demonstrated in both the wing feather development and weight was that the larger the brood size the greater the variance in both wing chord and weight. It seems that it is more difficult for the parents to make an equitable distribution of food in larger broods.

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Table 2. Numbers of Different-sized Broods according to Colony Location

Colony	Brood Size					
	1	2	3	4	5	6
Craig	0	0	0	1	0	0
Boyd	0	1	0	1	0	1
Deel	3	0	1	7	8	0
Caruthers	2	5	4	10	14	5
Kelley	1	3	3	6	1	1
McMillen	0	0	3	1	0	0
TOTAL	6	9	11	26	23	7

Table 3. Wing Chords at Time of Banding by Clutch Size

	Clutch Size					
	1	2	3	4	5	6
Percent 33-60 mm	0	22	19	39	6	12
Percent 61-90 mm	17	56	50	38	56	34
Percent 91-123 mm	83	22	31	23	38	54
Mean range within a brood (mm)	-	7.1	6.2	8.3	8.2	13.1