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American Coot distribution and migration in Colorado.—American Coots (*Fulica americana americana*) are widespread in North America, breeding primarily on fresh water wetlands and wintering on both brackish and fresh water habitats (Fredrickson, in Management of Migratory Shore and Upland Game Birds in North America, Sanderson, ed., Int. Assoc. Fish and Wildl. Agencies, Washington, D.C., 1977).

Despite being one of the more common marsh birds and a game species, the coot is often overlooked or ignored during waterfowl inventories or marsh evaluations. Current data concerning the coot in Colorado are limited. Cooke (The Birds of Colorado, Colo. Agric. Exper. Stat. Bull. 37, 1897), Keyser (Birds of the Rockies, McClory & Co., Chicago, Illinois, 1902), Selater (A History of the Birds of Colorado, Witherby and Co., London, England, 1912), Niedrach and Rockwell (The Birds of Denver and Mountain Parks, Colo. Mus. Nat. Hist. Pop. Ser. No. 5, 1939) and Bailey and Niedrach (Birds of Colorado, Denver Mus. Nat. Hist. Vol. I, 1965) summarized general information on nest observations, early and late occurrences and distribution. More recently Kingery and Graul (Colorado Bird Distribution Lati-long Study, Colo. Field Ornithol. and Colo. Div. Wildl., Denver, Colorado, 1978) updated distribution data and Lane and Holt (A Birder's Guide to Eastern Colorado, L & P Press, Denver, Colorado, 1979) gave average arrival and departure dates for eastern Colorado. We initiated surveys of wetlands in August 1976 to further delimit distribution, seasonal abundance and aspects of coot biology in Colorado.

Study areas and methods.—Counts of coots were conducted on 4 study areas to document spring and fall migration. Study areas were selected to represent the major topographic areas of Colorado and were located at Beebe Draw near LaSalle, Weld Co., on the eastern plains; Lake John, near Walden, Jackson Co., in North Park; Ice Pond, near Buena Vista, Chaffee Co., in the central mountains; and Hog Lake, part of Brown's Park National Wildlife Refuge (NWR), Moffat Co., in extreme northwestern Colorado. Each study area included an emergent marsh dominated by cattail (*Typha* spp.) and/or bulrush (*Scirpus acutus*) and areas of open water.

Weekly counts were initiated in 1977 to document spring migration at Beebe Draw and Lake John. Ice Pond and Hog Lake were not visited until after the peak of migration. However, counts by Brown's Park National Wildlife Refuge personnel from 14 March to 22 May 1977 were used to indicate coot migration at Hog Lake. In 1978, regular visits to all areas began by mid-March.

Distribution and status were determined from 108 questionnaires returned by field personnel of the Colorado Division of Wildlife and amateur ornithologists and by observations of 230 wetlands encountered while traveling between study areas throughout the state from August 1976 through November 1978. Most regions of the state were visited, with the exception of the far eastern plains, especially along the South Platte and Arkansas rivers.

Date or period of observation, dominant emergent vegetation, geographic location, coot numbers and status (breeding, resident, migrant only, etc.) were recorded for each wetland visited. Vegetation was classified as either cattail and/or bulrush, or other. Omitted were roadside ditches and wetlands completely filled with cattail and/or bulrush with no open water. "Other" included areas with sedges (*Carex* spp.), willows (*Salix* spp.), or grasses (Graminae) as the dominant emergents, or areas without any emergents, such as many lakes, reservoirs, and stockponds. Geographic location classifications were eastern plains, high mountain valleys and west of the Continental Divide. High mountain valleys refer specifically to North, Middle and South parks (large inter-mountain depressions devoid of extensive woodlands) and the San Luis Valley. Coots were considered to be breeding if territorial

TABLE 1
RELATIONSHIP OF COOT BREEDING DISTRIBUTION AND VEGETATION TYPE IN COLORADO

Area	Number of areas surveyed						χ^2 (df = 1)	Prob- ability
	Dominated by <i>Typha</i> or <i>Scirpus</i>			Dominated by other vegetation				
	With breed- ing coots	None or non- breed- ers	Total	With breed- ing coots	None or non- breed- ers	Total		
Statewide	45	31	76	15	136	151	63.13	<0.001
Eastern plains	17	10	27	1	58	59	42.02	<0.001
High mountain valleys	8	1	9	13	35	48	12.44	<0.001
West of Continental Divide	20	20	40	1	43	44	25.45	<0.001

behavior (as defined by Gullion, Wilson Bull. 64:83-97, 1952) and nests and/or young coots were observed during 15 April through 15 August, and nonbreeding if gregarious and non-territorial. Coots observed from 16 August through 14 April were classed as migrating or wintering. Distribution and status classifications were assigned according to the latilong system (Kingery and Graul 1978), with the state divided into 27 blocks based on lines of latitude and longitude.

Distribution and status.—Coots bred throughout most of Colorado. Breeding was not documented in 2 latilong blocks, one located in the southcentral mountain region and the other in the southeastern plains. Major breeding areas were Brown's Park on the western slope, and North Park and the San Luis Valley in the high mountain valleys. Breeding coots were not observed in Middle or South parks, although previously reported (Cooke 1897, Lane and Holt 1979) and to 3045 m elev. at Kenosha Pass (Bailey and Niedrach 1965). On the plains, coots were locally abundant where suitable habitat occurred.

Nesting coots were primarily associated with cattail and bulrush marshes (Table 1). A Chi-square test of independence between the presence or absence of breeding coots and the occurrence of cattail and/or bulrush dominated marshes indicated a strong relationship ($P < 0.001$) in each region and statewide. A similar analysis for the migration-wintering period also indicated a strong relationship ($P < 0.001$) statewide. Not all cattail or bulrush marshes were used by breeding, migrating or wintering coots, but they were used in strong preference to other vegetation types. Other vegetation types used for nesting included tamarix (*Tamarix gallica*), spikerush (*Eleocharis macrostachya*), willows and sedges. Sedges growing as emergents were characteristic of many high elevation wetlands used by coots, especially wetlands in North Park.

Coots were resident in low numbers (< 1000), mainly along the western boundary of the plains from near Fort Collins south to Pueblo. The presence of wintering coots was dependent on mild winter weather. Coots were present near Fort Collins during the winter of 1976-77, but absent during the 1977-78 winter when water areas froze. In the Fort Collins area, coots associated with wintering waterfowl and fed on feces and waterfowl carcasses. Christmas bird counts sponsored by The National Audubon Society (1960-1977) and listed in Audubon Field Notes and American Birds have consistently noted coots along the Front Range from Fort Collins to Pueblo.

Spring migration.—At Beebe Draw and Hog Lake coots arrived in late February or early

TABLE 2
TOTAL NUMBER OF COOTS OBSERVED DURING SPRING AND FALL MIGRATIONS 1977 AND 1978, 4 STUDY AREAS, COLORADO

Location	Month and week											
	March			April				May				
	1	2	3	4	1	2	3	4	1	2	3	4
Beebe Draw 1977	—	15	58	105	132	178	168	115	81	54	50	95
Beebe Draw 1978	0	5	17	32	58	98	94	88	80	48	56	58
Lake John 1977	—	—	—	—	0	146	851	706	394	172	172	199
Lake John 1978	—	0	0	0	0	304	688	689	—	305	—	124
Ice Pond 1977	—	—	—	—	—	—	—	305	—	—	75	85
Ice Pond 1978	—	31	79	184	222	264	348	271	—	280	—	59
Hog Lake 1977	—	100	—	500	—	680	—	—	345	—	280	200
Hog Lake 1978	35	179	307	489	674	846	782	646	—	351	—	105

Location	Month and week											
	August			September				October				
	1	2	3	4	1	2	3	4	1	2	3	4
Beebe Draw 1977	39	46	63	72	—	141	127	114	—	—	19	0
Beebe Draw 1978	—	90	130	179	—	267	393	532	—	520	603	214
Lake John 1977	911	987	990	1279	2477	2680	3255	1964	2648	2290	1995	1779
Lake John 1978	—	367	525	695	865	1252	2340	2836	2694	2255	3141	1766
Ice Pond 1977	151	—	269	326	346	443	406	395	306	192	—	96
Ice Pond 1978	—	123	170	184	218	222	274	251	222	207	136	107
Hog Lake 1977	—	—	575	273	518	367	402	435	336	301	—	215
Hog Lake 1978	—	345	307	368	577	499	652	620	678	549	422	349

March. Peak numbers were recorded in 1977 and 1978 during the second week of April (Table 2). At Lake John coots arrived in 1977 and 1978 during the second week of April, although coots were present elsewhere in North Park the previous week. Arrival date was dependent on ice thaw. In both years numbers increased rapidly for 2 weeks, then decreased to resident levels within 3–4 weeks. Although coots arrived at Ice Pond earlier than Lake John, peak numbers were also recorded the third week of April. The decrease of coot numbers from peak to resident levels in 1977 and 1978 was consistent with other areas.

Timing of migration and relative numbers observed on each area were consistent between years. The general pattern statewide was arrival in late February or early March (first week of April at Lake John), increasing to peak numbers during the second to third week of April, then decreasing to resident levels by the second to fourth week of May. Timing of peak migration was similar for the eastern plains and west of the Continental Divide. The peak occurred 1 week later in the high mountain valleys. The literature suggests a similar pattern of coot migration in Colorado.

Summer movements.—Numbers of adult coots increased gradually on the study areas and/or peripheral marshes starting in mid- to late July. Increases in numbers of immature coots 30 days of age or older occurred in mid- to late August. An influx of adult and immature coots on Hog Lake in 1977 began about 2 weeks earlier than the general pattern found on other areas.

The late summer buildup was influenced by local conditions. Adult and immature coots will leave a marsh as water levels recede and it dries (Ryder, Ph.D. thesis, Utah State Univ., Logan, Utah, 1958). This situation was particularly applicable to Beebe Draw and Hog Lake, where breeding coots occurred on nearby marshes. Movements onto Hog Lake were in part related to pumping schedules and water levels on nearby marshes. Water levels were allowed to recede on some marshes in Brown's Park NWR as the summer progressed. Immature coots crossed the Green River in the direction of Hog Lake on at least 1 occasion.

Fall migration.—Peak numbers were recorded in 1977 on all areas during late August to mid-September, before the waterfowl hunting season of 1–14 October (Table 2). In 1978, peak numbers were observed 5 weeks later at Beebe Draw, 2 weeks later at Lake John, 1 week later at Ice Pond and 6 weeks later at Hog Lake. Peak numbers occurred before the 30 September–13 October 1978 waterfowl season at Ice Pond and during or after the hunting season for the other areas. In November 1977 and 1978, coot numbers decreased to minimal levels. No coots were known to winter on the study areas.

Compared to spring, fall migration occurred over a more widespread period, with less dramatic changes in numbers and with less consistency in timing. Successive migratory waves may explain the fluctuating numbers observed on some Colorado areas.

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