

The status of Cassin's Sparrow in New Mexico and adjacent states

*A resumé of the breeding and seasonal
occurrence of a most elusive species
. . . and some questions.*

by John P. Hubbard

FOR ALL OF ITS OBSCURITY in plumage and behavior—except when singing and skylarking—Cassin's Sparrow (*Aimophila cassinii*) is among the most intriguing passerines in North America, and much remains to be learned about it. Perhaps the main source of intrigue has to do with breeding, including the question of where in its summer range the species actually nests. The answer to the latter remains unclear in parts of the range of Cassin's Sparrow, including in New Mexico. Hence, I propose to explore the facts as we now know them.

Cassin's Sparrow is stated to summer in Arizona, New Mexico, Colorado, Kansas, and Texas southward to Chihuahua, Coahuila, San Luís Potosí, and Tamaulipas (Miller *et al.*, 1957). To date, actual proof of breeding seems to have been obtained in Arizona (Ohmart, 1966; 1968), Colorado, New Mexico, and Texas (Williams and LeSassier, 1968), Oklahoma (Sutton, 1967), Kansas (Johnson, 1964), and possibly in Chihuahua and Coahuila (Miller *et al.*, *op. cit.*). Otherwise, the species is known in winter or migration in Sonora, Sinaloa, Guanajuato, and Nuevo Leon in Mexico (Miller *et al.*, *ibid.*) and casually in Nevada, New Jersey (Williams and LeSassier, 1968) and in California (Small, 1974).

In New Mexico, only three actual nests have been reported, all in the eastern plains (Hubbard, 1970). The first record seems to have been in San Miguel County, where a nest with four eggs and a parent bird were taken 15 miles southwest of (11) Mosquero¹ on July 3, 1933 (Phillips, 1944). In the summer of 1968—a great year for Cassin's Sparrows in New Mexico—S. A. Rohwer (pers. comm.) found a nest with eggs near (27) Tatum, Lea Co., on June 17 and another near

(38) Hobbs, Lea Co., on June 16. On June 12 he collected a laying female near (17) Ragland, Quay Co., and birds carrying insects were seen south of there on the same day.

BEYOND THESE RECORDS, there are many others over the state in summer, but mainly without proof of breeding. However, two of the earliest records are implied to represent breeding by the A.O.U. Checklist (1957), which states that the species "Breeds [in] . . . southwestern New Mexico (Apache, Deming). . . ." The (53) Apache (=Hachita, Grant Co.) record actually refers to several occurrences reported by Anthony (1892), i.e. "first seen on July 19, and common until late fall . . . in full song until the last". Anthony collected at least five birds in the period July 19 to August 30, 1886, all being adults (3 ♂♂, 1 ♀, 1 ?—Carnegie Mus. Nat. Hist.). The (42) Deming, Luna Co., record apparently refers to an adult male collected there by E. A. Mearns on April 18, 1885 (U.S. Nat. Mus.), although George Armstrong also took four adults there in the period March 17–22, 1887 (3 ♂♂, 1 ♀—Field Mus. Nat. Hist.).

Nothing on the specimen labels or in any of the reports I have seen of Anthony, Mearns, or Armstrong indicates that these birds at Hachita or Deming were indeed breeding. Thus, if the statement in the Checklist (*op. cit.*) is based on these occurrences, the implication of breeding is based on assumption and not on proof. Such an assumption would be tenable for many temperate Northern American passerines, for which summer occurrence of numbers of singing birds with enlarged gonads is strong indication of breeding; however, as Phillips

¹ Numbers preceding localities are keyed to map



Cassin's Sparrow. Painted for American Birds by Guy Tudor

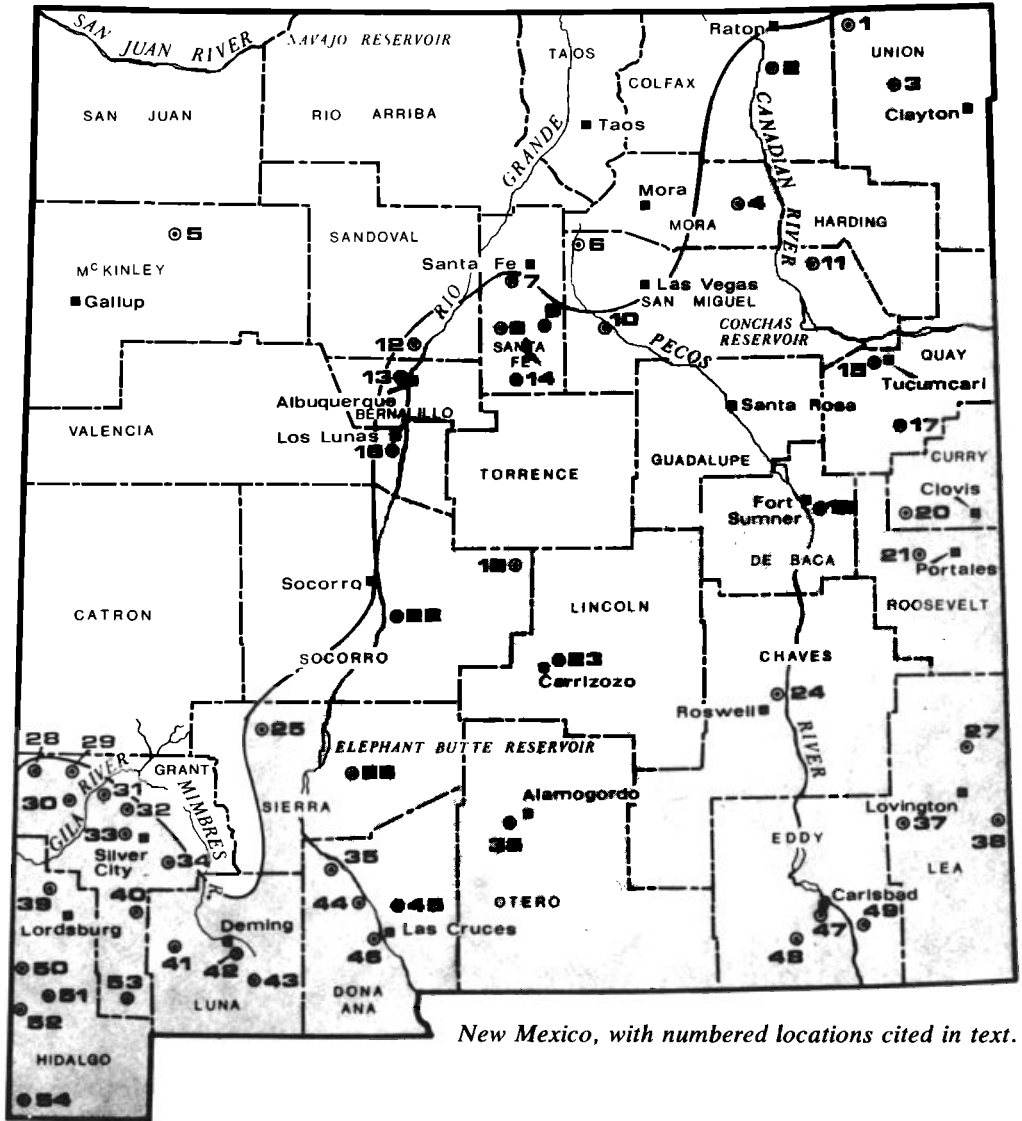
(1944) showed—but apparently not to the satisfaction of the 1957 A.O.U. Check-list Committee—Cassin's Sparrow is not to be equated with most temperate zone passerines, at least in Arizona.

Phillips (*op. cit.*) showed that, in all of the huge body of data on Arizona birds gathered through the early 1940s, no concrete proof existed that Cassin's Sparrow had actually bred in the state. Phillips carefully researched the matter in the field and in museums, and the nearest thing to proof of breeding he discovered was near Tucson in 1939. That instance involved a bird on August 22 that he found building a nest, only to find it still incomplete and abandoned on August 28.

Phillips *et al.* (1964) reiterated the lack of existence of proof that Cassin's Sparrow nested in Arizona, where substantiated records ranged from mid-summer (June 29) through autumn-winter to mid-spring (May 6). Recently, however, Ohmart (1966) succeeded in finding three nests of this species near Tucson, between late July and early September 1966. Ohmart (1968) also implied that it bred in the area in July 1967, and this has

continued to the present (Ohmart, pers. comm.).

OHMART'S FINDINGS CAN BE interpreted in several ways; one is that numbers of Cassin's Sparrows have bred in Arizona all along, with proof of nesting simply being unattained until recently. Another interpretation is that the status of the species has changed, and now the bird breeds in Arizona whereas it did not do so in the past. Yet another explanation, and the one that I favor, is that Cassin's Sparrow may well have bred very locally and perhaps irregularly in Arizona for some time, but the bulk of "summer" birds there are nonbreeders—in spite of their apparent "breeding" behavior (i.e. singing and skylarking) and enlarged gonads. It is simply unthinkable that the many excellent field workers in Arizona would have overlooked it, if this bird had bred widely in that state. Whether breeding is or will become widespread in Arizona is questionable, but at present the impression is that Cassin's Sparrows are not now breeding there in massive numbers.



New Mexico, with numbered locations cited in text.

To return to New Mexico, one finds that between the late nineteenth and the middle twentieth century the bulk of the records of Cassin's Sparrow was from the eastern two-thirds of the state. In the southwest, west of the Rio Grande, I know of no specific records after the 1880s until August 27–29, 1959, when I saw a singing bird at (33) Silver City, Grant County. Among the next records is a singing bird seen 12 miles south of (40) Silver City on July 24, 1962, (“the only one recorded in the area in five years [of residence there]”) by D. A. Zimmerman. Presumably others might have been present near (52) Rodeo, Hidalgo Co., late June 1962, when

they were reported by Zimmerman to be conspicuous just west of there in Arizona (*Audubon Field Notes*, 16:498, 1962).

The above is not meant to indicate that Cassin's Sparrows foresook southwestern New Mexico between 1887 and 1959, for they certainly must have at least passed through the area en route to Arizona. However, based on *recorded data*, there is little to suggest their presence in the area, much less in numbers or as breeding birds.

Southwestern New Mexico was, of course, not overrun with students of birds in the 70-odd years in which no Cassin's Sparrows were reported, but there were some excellent

workers in the field in the period. For example, R. T. Kellogg resided and collected birds widely in the Grant County area between 1912 and 1937. One of his favorite collecting areas was between Silver City and Deming, especially in the lower Mimbres drainage; yet he has no Cassin's Sparrows in his collection at all. Among the others who, to varying degrees, worked in southwestern New Mexico in those 70+ years were J. T. S. Hunn, E. A. Goldman, J. S. Ligon, A. Twomey, A. R. Phillips, and O. Milton. None of these people collected or reported Cassin's Sparrows in the area, at least in the months of May or June.

RECORDS OF CASSIN'S SPARROWS in southwestern New Mexico west of the Rio Grande began to accumulate in an accelerating fashion in the early 1960s, with the first specimens of note being two adult males taken by D. M. Niles at (54) Cloverdale, Hidalgo Co., on July 3, 1962. In 1963, L. L. Wolf and I found a singing bird on (32) L. S. Mesa, northwest of Silver City on July 4, several singing birds south of (40) Silver City on July 7, and fair numbers 8 miles northwest of (39) Lordsburg, Hidalgo Co., on July 8. Birds taken on the last two dates—plus those from Cloverdale the year before—showed enlarged gonads and singing-skylarking behavior; however, there was no proof that the birds were actually breeding (see Phillips, 1944). On June 26, 1964, B. K. Harris found four singing birds near (51) Animas, to provide the earliest summer record yet for this species in Hidalgo County. Again there was no proof that the birds were actually breeding in the area.

Even with the increase of records in the early 1960s, observations of Cassin's Sparrows in southwestern New Mexico were lacking in the period between mid-April and late June. In 1968, occurrences in this period of the year began to accumulate: on June 13, D. A. Zimmerman counted 23 Cassin's Sparrows near (41) Gage, Luna Co., during a 25-mile Breeding Bird Survey; on the nearby (42) Deming route, he found none of these sparrows on June 10 (see Table 1). Also in 1968, D. M. Niles collected specimens (all adults) at westerly localities as follows: two near (35) Hatch, Dona Ana Co., on June 17; one near (25) Winston, Sierra Co., on June 15;

one near (26) Engle, Sierra Co., on June 13, three near (18) Claunch, Socorro Co., June 5-6; and two near (14) Moriarty, Santa Fe Co., June 2. Additionally, small numbers of birds were seen by Niles near (53) Hachita on June 19, (12) Sandoval, Sandoval Co., on July 5, and near (13) Albuquerque on July 8. I saw one singing bird near (31) Gila on June 17 and another near (29) Buckhorn, both Grant Co., on July 3. As far as I am aware, all of these records represent markedly early summer occurrence in these cited localities, with previous dates—if any—later in July or in August. Almost all the birds reported above were singing, and the males collected by Niles had enlarged gonads. The female from the Hatch area had the ovary regressed and an old brood patch, but where she may have bred is unknown.

In several subsequent years near (41) Gage, Cassin's Sparrows were again recorded on Breeding Bird Surveys, *i.e.* in 1969-70 and 1973; none was recorded in 1972, and the route was not run in 1971 and 1974-76 (Table 1). Cassin's Sparrows were recorded on the Deming route only in 1971, but not in 1968-69 or 1974-75 (route not run in 1970, 1972-73 and 1976). In 1973, the species was reported to be present and singing near (24) Hurley, Grant Co., on May 17 and later by D. A. Zimmerman (*New Mexico Ornith. Soc. Field Notes*, 12:23, 1973), and a stub-tailed young was seen there by the same observer on July 2 of that year (*op. cit.*:46). The latter appears to be the first actual evidence of nesting in southwestern New Mexico, obtained some 87 years after the species was first recorded in that general area! The summer of 1973 also yielded records of several birds in the (28) Mule Creek area of Grant County on July 6-19, as well as some additional northeastern peripheral records, *i.e.*, at (10) El Pueblo, San Miguel Co., and (8) Madrid, Santa Fe Co. (*N.M.O.S.F.N.*, 12: 1973). In 1975, singing birds were present in May and later near (52) Rodeo (R. Scholes, pers. comm.), and 18 were counted by R. J. Raitt on May 27 along a census route on the (45) Jornada Experimental Range, Dona Ana Co. (Table I). In 1976, I heard one bird at (54) Cloverdale on June 7, but none was found there on subsequent days, nor did I find any in various parts of Hidalgo County in that month; O. VanBuskirk reported two near (30)

Table 1. Cassin's Sparrows Recorded on May-June Breeding Bird Surveys¹ in New Mexico

Counts ²	Years and Sparrow Numbers ³								
	1968	1969	1970	1971	1972	1973	1974	1975	1976
Socorro Co. (22) San Antonio	—	—	—	—	—	0	0	0	—
Luna Co. (41) Gage	23	13	14	—	0	37	0	—	—
(42) Deming	0	0	—	3	—	—	0	0	—
Dona Ana Co. (45) Jornada	—	—	—	—	—	—	—	18	0
Lincoln Co. (23) Carrizozo	0	—	0	—	—	0	—	—	—
Lea Co. (37) Maljamar	—	—	—	—	—	—	—	109	—
Chaves Co. (24) Roswell	67	80	105	3	20	257	35	161	19
Roosevelt Co. (21) Floyd	—	—	0	—	—	251	—	236	—
DeBaca Co. (19) Cooley Lake	14	29	—	—	67	244	208	—	145
Quay Co. (15) Tucumcari	—	—	—	—	—	—	—	31	—
San Miguel Co. (4) Wagon Mound	—	—	2	0	0	0	7	—	0
Union Co. (3) Grenville	72	74	48	67	66	26	87	38	33
Hidalgo Co. (52) Rodeo	—	—	—	—	—	—	0	—	0
Santa Fe Co. (8) La Cienega	0	0	0	0	0	3	0	0	3
Valencia Co. (16) Los Lunas	0	0	0	0	0	0	0	0	2

¹ These are run over a 25-mile, 50-stop roadside route once each year for the U.S. Fish and Wildlife Service

² Numbers in parentheses are keyed to map.

³ Dashed line means route not run in that year.

Cliff, Grant Co., on June 5. These were the only June reports in the southwest. None was found on Breeding Bird Survey routes (Table I) at Wagon Mound, Jornada, or Rodeo that year, but peripheral birds were found near (7) La Cienega and (16) Los Lunas. Birds arrived in good numbers in the southwest in July, and on August 2 west of (50) San Simon Cienega, W. Principe and B. Locke found a nest with eggs—these missing on August 12—the first recorded for Cochise County, Arizona (*N.M.O.S.F.N.* 15:31, 1976).

AT THIS POINT, let us summarize the above information and draw some conclusions concerning it:

1. Older statements to the effect that Cassin's Sparrow breeds in southwestern New Mexico (and southeastern Arizona) were based on assumptions rather than fact, e.g., late July and August records at Hachita and an April (and possibly March) record at Deming.
2. A dearth of records exists for south-

western New Mexico for the period 1887 to 1959, with an increase of records in the period beginning in 1962—perhaps in part as a result of increased observer coverage in the area.

3. The first May to mid-June records in southwest New Mexico were reported beginning in 1968, with such reports obtained from the Gage-Deming-Hurley areas in that year and subsequently in 1969, 1970, 1971, and 1973; the species was also recorded in May to mid-June near Hatch (1968), Winston (1968), Engle (1968), Cliff-Gila area (1968, 1976), Rodeo (1975), the Jornada Experimental Range (1975), and Cloverdale (1976).
4. The year 1968 marked the occurrence of Cassin's Sparrows far west of their previously known May–July range and farther north in New Mexico as well, including at Sandoval, Moriarty, Albuquerque, and Claunch; in subsequent years there have been such records at (1) Folsom, (2) Maxwell N.W.R., El Pueblo, and Los Lunas.
5. Proof of nesting by Cassin's Sparrows in New Mexico exists for San Miguel and Lea counties on the eastern plains and in 1973 in the Hurley area, where a stub-tailed young was seen by D. A. Zimmerman. Additional proof of nesting is needed in the state, plus information on numbers and distribution. In particular, the status needs to be monitored continually in the far western parts of the bird's range, i.e. northeast of the Sangre de Cristo Mountains, in the central Rio Grande Basin, and between the Tularosa Basin and the Arizona line.
6. Data obtained to date should be interpreted cautiously and conservatively. For example, we should not dismiss the notion that Cassin's Sparrow has undergone a change in its summer and breeding status in the western parts of its New Mexico range in the last decade or two. Although logic would seem to argue against this idea, many birds have undergone changes in status in the Southwest in

historic times (see Phillips, 1968)—frequently in the apparent absence of obvious ecological or other changes

BESIDES THE BREEDING STATUS, there are other aspects of the status and range of Cassin's Sparrow that are far from fully elucidated. For example, it is presumed that the species winters only rarely in New Mexico. There is, in fact, only one verified record, a female collected near (52) Rodeo on December 1, 1957 (Southwestern Research Station Coll.). Another specimen, a female taken near (47) Carlsbad on November 16, 1954 (Museum of Southwest Biology), may also represent an instance of wintering (an unsexed adult was also taken in the area on October 26, 1975—Eastern N.M. Univ.).

Other possible cases of Cassin's Sparrow wintering in New Mexico are unsubstantiated, and these include reports of birds on two Christmas Bird Counts: 29 on December 22, 1966 at (49) Loving and five at (48) Carlsbad Caverns Nat'l Park on January 1, 1966 (*Audubon Field Notes* 20:345, 1966; 21:342, 1967). The check-list of birds from San Andres National Wildlife Refuge (U.S.F.W.S. RL-122-R2, 1961) contains the only other wintering report, the unsubstantiated claim that the species occurs uncommonly there at that season. All data considered, it appears that Cassin's Sparrow is only a rare, casual to occasional winter resident in the state, credibly recorded in the south near Carlsbad and Rodeo.

It needs to be pointed out that the lack of winter records may well stem in part from the inconspicuousness of the bird at that season. The bird does winter as near as Midland, Texas (Williams and LeSassier, 1968) and Cochise County, Arizona, (Phillips *et al* , 1964), and in neither area is it easily seen. Netting might yield more data on the bird in winter, and it would not be surprising to find the species to be more numerous and widespread in New Mexico than current information shows.

IF CASSIN'S SPARROWS largely desert New Mexico in winter, the question arises as to when they leave and when they return. Again, we are faced with a lack of substantial data in answering this question, due

largely to the inconspicuousness of the species when it is not singing and skylarking. The latest specimen records for the eastern part of the state are the October 26 and November 16 birds mentioned in the discussion on wintering. In addition, a full grown juvenile was taken northeast of (24) Roswell on October 18, 1953 (Univ. Michigan Mus. Zool.). Otherwise, the latest records—even sightings—are in July (except for two Christmas Bird Count reports), which seems unrealistically early for autumn departure there.

Farther west, the latest autumn specimens are of single fresh-plumaged males at (44) Radium Springs, Dona Ana Co., on September 22, 1939 (Carnegie Mus. Nat. Hist.) and at (36) White Sands National Monument, Otero Co., on September 25, 1937 (Mus. Southwestern Biol.). Other late records—all sightings of single birds—are in 1972, i.e., on September 16 at (9) Galisteo Lake, Santa Fe Co., by P. R. Snider; September 19 at (45) Jornada Experimental Range by D. L. Hickman; and on September 30 in the (17) Florida Mountains by D. A. Zimmerman.

From present data, it would appear that many or most Cassin's Sparrows leave their New Mexico range by late September. Migrants may be present later than this, but separating them from possible wintering birds—especially in the extreme southeast and southwest—would be a problem after mid-October. In Oklahoma there are few autumn records and only four specimens at that season, i.e., one each on September 1, and November 21 (Sutton, 1967) and on September 11 and 17 (J. Weske, pers. comm.). In Texas after mid-October there are no specimen and few sight records north of 32°N latitude, with the bulk of the latter being around Midland (Oberholser, 1974).

THE WINTER RANGE of Cassin's Sparrow outside of New Mexico definitely includes southeastern Arizona (Phillips *et al.*, 1964), southern Texas—north to about 32°N—rarely farther (Oberholser, 1974), Coahuila (Hubbard and Crossin, 1974), and Sonora and Nuevo Leon (Miller *et al.*, *ibid.*). The species may also winter in Sinaloa, Chihuahua, Guanajuato, San Luis Potosí, and Tamaulipas—where there are records at

other seasons (Miller *et al.*, *ibid.*), the bird was also taken in Durango in September 1955 (A. R. Phillips, pers. comm.), and it is expected as well as in Zacatecas.

In spring the earliest specimen records for New Mexico are the aforementioned series taken at (6) Deming in the period March 15–22, 1887 and on April 18, 1885. There are some spring sight records, including 1–2 near (46) Las Cruces on April 12 and 23, 1971 by S. West, and small numbers found singing by me in the eastern plains between April 30 and May 15, 1971 (*N.M.O.S.F.N.* 10 21, 1971). In 1974, I heard twittering notes presumed to be of this species near (20) Melrose on March 13, but no songs were heard and no birds were actually seen. In 1975, C. G. Schmitt and M. C. Conway found singing birds in the (49) Carlsbad to (38) Hobbs area on April 4–6, and I found others April 28 in the (21) Portales area.

From the above data, it would appear that Cassin's Sparrow returns in numbers and begins singing in New Mexico by April and possibly in March. This is in general agreement with the situation in adjacent states. For example, in Oklahoma the earliest spring record is March 24 (the earliest specimen record is May 4). In Colorado and Kansas there seems to be little published on spring arrivals, but (Ely, 1971) recorded the species at Ft. Hays, Kansas, on April 29 and May 8. In Texas an apparent migratory influx occurs in March, even in areas where some birds are known to winter (Williams and LeSassier, 1968). In Arizona, the latest confirmed spring record given by Phillips *et al.* (1964) is May 6 near Tucson, and the migratory exodus there begins in March or April. In Sonora the species has been taken as late as March 27 and April 1 at Guirocoba (Van Rossem, 1945).

A final word about distribution of the species has to do with vagrancy, which at this point is somewhat difficult to define. In New Mexico, a bird seen by G. Monson near (5) Crownpoint, McKinley Co., in July 1938 (Hubbard, 1970), was certainly out-of-range, as was a bird at (6) Cowles, San Miguel Co., at 7800 ft. elevation, in the autumn of 1883 (Henshaw, 1886). Genuine vagrants include three records from the Farallon Islands of California, one each in June, July, and September (Small, 1974), and also birds

recorded in the Timpahute Valley, Nevada, at Island Beach, New Jersey (Williams and LeSassier, *op. cit.*), and Seal Island, Nova Scotia (Finch, 1975).

DATA ON HABITAT SELECTION by Cassin's Sparrow in New Mexico is mainly from birds located by song and skylarking behavior, i.e. engaged in "breeding" activities. In general, observers are in agreement as to the major aspect of this habitat: grassland in which grow scattered to moderately dense mixtures of shrublike plants, such as yuccas and/or mesquite. Pure grassland and dense shrubland seem to be avoided for the most part. On (2) Maxwell National Wildlife Refuge, Colfax Co., I found Cassin's Sparrows in alfalfa fields in the period June 13 to 21, 1971 (*N.M.O.S.F.N.* 10:45, 1971). Habitat preference at other times of the year also seems to focus on shrubby grassland.

The breeding season in Cassin's Sparrow is a long one. In Kansas, Johnston (1964) indicates that eggs are laid in May and June, whereas in Oklahoma (Sutton, 1967) they are recorded from May 26 to July 22. In Texas, eggs have been found between March 1 and August 1 (Oberholser, 1974); the dates of 85 egg sets from there fall between April 12 and July 23, with 52% in the period May 2-29 (Williams and LeSassier, *ibid.*). In New Mexico, eggs in three nests were found in June and early July in the eastern part of the state, and the bobtailed fledgling in the southwest was recorded on July 2. In Arizona, three nests presumably contained eggs in late July, with fledging occurring in August and September (Ohmart, 1966). In Mexico, a juvenile (raised locally?) was collected near Villa Ahumada, Chihuahua on June 21, and "breeding" (how determined?) was reported on July 3 near Saltillo, Coahuila (Miller *et al.*, *ibid.*).

From the above, it is apparent that breeding begins earliest in Texas, i.e., in March. I have no information concerning any geographic difference in that state in timing of breeding, but it seems likely that this begins first in the extreme south. It seems likely that multiple broods are raised in Texas, perhaps statewide. Certainly, the span of egg dates, whether 3¼ months (Williams and LeSassier, *ibid.*) or 5 months (Oberholser, *op. cit.*) is sufficient time for this to occur. In Oklahoma,

Kansas, and eastern New Mexico, egg dates span shorter periods (variously May-July), but multiple broods could be raised in those areas as well. In Arizona only one brood would appear likely in the two month breeding period so far reported there (i.e., late July to early September).

ALSO FROM THE ABOVE, it is apparent that breeding begins earliest, is most prolonged, and involves the most birds in the Southern Plains and adjacent areas; it appears to begin later, to be least prolonged and to involve the fewest birds in Arizona. Other areas are too poorly known to comment on in detail, but southwestern New Mexico may agree with Arizona in the volume of breeding and with the Southern Plains in prolongation.

To explain differences in the breeding cycles, one finds what may be the key in Phillips (1944). That author points out that the spring months in the Southern Plains are typically relatively moist, whereas they are dry in Arizona. Moisture in the latter area usually begins to fall in mid-summer (late June to mid-July), while continuously present in the former area. The gist is that the vegetation and probably food supplies (e.g., insects for young) are better developed in the Southern Plains than in Arizona in spring, and it is likely that these conditions account for Cassin's Sparrows returning first to the former area to begin breeding.

The question then arises: what happens if moisture conditions are unsuitable in Cassin's Sparrow habitat in the Southern Plains in the spring? Actually, one of two factors could be involved: (1) too much moisture could fall, and excessively rank vegetation could develop; this could occur especially in the eastern plains and later in the summer; and (2) too little moisture could fall, and too little vegetation and/or food could be provided; this situation could occur especially in the western plains and in spring-early summer. Both events could cause an exodus of Cassin's Sparrows from an area, either before breeding or after raising a brood. That such may occur has not quantitatively been demonstrated, but comments in the literature suggest that it well may occur. For example, Ligon (1961) and Wauer (1973), writing about more arid areas in or adjacent to the western parts of the Southern Plains, remark that wet years

produce numbers of Cassin's Sparrows, which may be absent in very dry years. On the other hand, Williams and LeSassier (*ibid.*), claim the reverse to be the case in the plains around Midland, Texas, which are less arid than the above areas. Sutton (1967) indicates that in Oklahoma year-to-year fluctuations occur in this species—especially in the eastern part of its range in the state, but he does not relate this to any environmental parameters. Finally, fluctuations in numbers are documented on breeding censuses in New Mexico (Table I), with extreme differences approaching 100%.

The facts and figures concerning Cassin's Sparrow may make complicated reading, but they combine to portray this as an extremely interesting and certainly well-adapted species. The crux of this apparent adaptiveness would seem to involve the bird's apparent ability to locate suitable areas for breeding while maintaining a state of reproductive readiness. I say "apparent" because the evidence in support of the existence of such abilities is mainly circumstantial; yet the thesis seems highly plausible.

Ohmart (1969) and Phillips (1971) visualize these adaptations in Cassin's Sparrow as part of a scenario in which a duality of breeding ranges is involved, i.e., with the species breeding first in the Southern Plains and then (some) birds doing so later farther west, e.g., in Arizona. Whether some individuals breed both in the Southern Plains and in Arizona in the same season is not known, and without solid evidence any contention that birds do so is open to question. At this point, a more conservative view is that most Arizona breeders are birds that were not able to breed in the Southern Plains, with the remainder being a small resident population. In any case, I am sure that this grassland nomad will continue to be among our most intriguing birds, even after the facts come in!

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