Expansion of Cassin's Sparrow (*Aimophila cassinii*) North of Tucson, Summer 2006

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Before 1965 Cassin's Sparrow (*Aimophila cassinii*; Figure 1) had not been documented as a breeding species in Arizona (Philips et al. 1964). Singing and skylarking males had been observed during the late summer monsoon seasons in southeastern Arizona, but some authorities at the time proposed that these birds were postbreeding visitors from the principal nesting areas in Texas and that they were simply going through the motions of displaying (Philips 1944). In 1965, three nests were found seven miles southeast of Tucson (Ohmart 1966). Since this discovery, Cassin's Sparrow has been documented as a regular breeder in southeast Arizona grasslands (Monson and Philips 1981). Surveys in the 1990s for the *Arizona Breeding Bird Atlas* confirmed breeding in Yavapai, Pima, Cochise, and Graham Counties, probable breeding in Santa Cruz County, and possible breeding in Greenlee and Apache Counties (Corman 2005).

Figure 1: Cassin's Sparrow - *Photo by Oliver Niehuis.*

One of the most unusual characteristics of Cassin's Sparrow is its annual fluctuation in population and range, particularly in response to summer rainfall. In the center of its range, population densities can vary considerably, and at the periphery "singing males can suddenly appear (often in large numbers) in some years at locations where no birds usually breed" (Dunning et al. 1999). The summer of 2006 offered an opportunity to observe and document the movement of Cassin's Sparrow into peripheral habitat areas in southern Arizona. According to the National Weather Service, July-September 2006 was the sixth wettest summer monsoon season in the Tucson area since record-keeping began in 1896 (National Weather Service, 2006).With this plentiful rainfall, native grasses were tall and thick in areas where they are usually sparse. In locations where the grass grew lush among scattered mesquites and cactus, excellent habitat was created for Cassin's Sparrows.

Surveys were conducted in a semidesert grassland area north of Tucson. Cassin's Sparrows had neither been reported breeding in this area previously nor reported there recently at any time of year. Between 16 August and 25 September, 2006 observations were made in an area from 0.5 miles north of the town of Oro Valley, Pima County to north and east of Oracle, Pinal County (Figure 2). Both roadside stops and walking transects were employed. Within this area singing or skylarking Cassin's Sparrows, sometimes involving up to six to eight birds, were found at seven locations. Several other areas north of Tucson, with similar habitat, were

checked where no Cassin's Sparrows were found (Table 1).

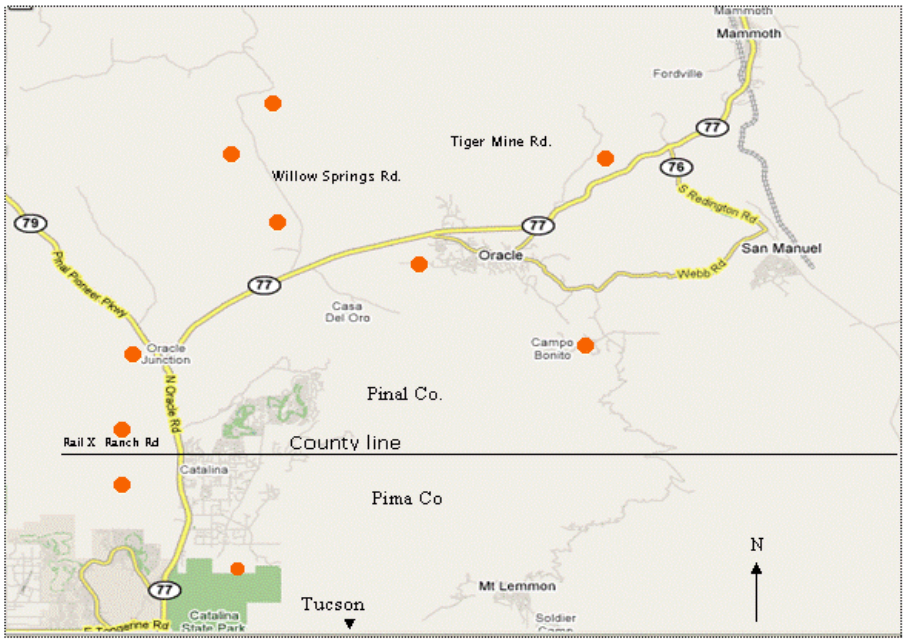

Figure 2—Red dots show locations of territorial Cassin's Sparrows—August and September 2006

The extensive skylarking by males at the locations surveyed suggests that females were present. Dunning et al. (1999) note that flight-songs increase "markedly with arrival of females. Not unusual for 100% of songs to be delivered in flight during periods of intense singing. Female presence on territories invokes intense skylarking." An area in Pinal County along Willow Springs Road northwest of Oracle Junction, where at least six males were skylarking on adjacent territories, was searched for more evidence of breeding. This is a lightly grazed upland desert grassland area at an elevation of 1140 m (3740 ft). Several grass species provided considerable ground cover and included annuals such as six weeks needle grama (*Bouteloua aristidoides*) and perennials such as Arizona cottontop (*Digitaria californica*; Philips and Comus 2000). The cover was thick enough for sparrows to run many yards without being seen. Other vegetation in the 10-acre area included scattered velvet mesquite, soaptree yucca, barrel cactus, and various species of prickly pear and cholla cactus.

On each of two mornings—30 August and 13 September—at least three hours was divided between sitting in the centers of two territories. Males moved from one perch to another, engaging in their flight-songs. Occasionally, they flew to the ground and disappeared in the grass for up to 10 minutes. They primarily sang while in flight rather than from perches, and they appeared to be delineating the perimeters of their territories. The perches were not necessarily the highest points in their tracts. According to Schnase et al. (1991) this behavior suggests the males had gone beyond staking out and defending territories to establishing pair-bonds. However, on only three occasions were possible female birds seen. In one territory a nonsinging individual was briefly observed with a caterpillar (19 Aug) at the same time a singing male perched nearby. At two other times (30 Aug) nonsinging birds briefly joined males in lower mesquite branches. No noticeable interactions occurred between these individuals and the males. Females may have been present and more active than it appeared, as they spend 95% of their daytime hours on the ground where they would have been hidden in the thick grass (Schnase et al. 1991).

Table 1: Cassin's Sparrow Survey

Sites	Surveys	Observation of Birds
Rail X Ranch Rd.	16 Aug—On transect 1.0 miles w. of Hwy 77 extending 0.6 miles south and 0.2 miles north of Rail X Ranch Rd.	Heard 4 singing--1 of which was observed skylarking
Hwy 79	16 Aug—Wayside 0.5 miles from Oracle Jct. 1 Sept—A dozen irregularly located stops along 15-mile stretch between Park Link Dr. and Deep Well Rd.	Heard 2 singing Heard or saw none
Willow Springs Rd.	16 Aug—Irregular stops along first 4.0 miles from Hwy 77 19 Aug—Site 2.7 miles from Hwy 77 30 Aug—Site 2.7 miles from Hwy 77 30 Aug—4.6 miles from Hwy 77 13 Sept—Site 2.7 miles from Hwy 77 25 Sept—Site 2.7 miles from Hwy 77	Heard 4 singing from road Heard and observed 6 singing and skylarking Heard and observed 6 singing and skylarking—sat in two territories for a total of 3 hours Heard 1 singing near ranch pond Heard and observed 6 singing and skylarking—sat in same two territories for a total of 3 hours Heard or saw no birds
Catalina	18 Aug—Walked 1.0-mile north-south transect between Rollins Rd. and Catalina State Park	Heard 8, 4 of which were seen skylarking
Oracle Sewage Ponds	19 Aug—East side of Hwy 77 0.4 miles west of American Ave. 21 Aug—Same as above	Observed 1 singing and skylarking Heard 4 singing
Mt. Lemmon Hwy	19 Aug—0.1 miles w. of Campo Bonito Rd.	Heard 2 singing
Tiger Mine Rd.	30 Aug—2.0 miles from Hwy 77, northeast of Oracle	Heard 1 singing
Hwy 77	30 Aug—7-mile stretch on Hwy 77 Oracle to Mammoth with 8 stops at 1.0 intervals	Heard or saw none
Coolidge Airport Rd.	1 Sept—a dozen irregularly located stops along 2.5 mile stretch	Heard or saw none—Note: grass not very thick

The observed behavior suggests possible, and maybe even probable, breeding. This is noteworthy as the Arizona Breeding Bird Atlas did not report any signs of possible or probable breeding of Cassin's Sparrows in Pinal County (Corman 2005). Possible breeding was defined by the Atlas as the presence of a singing male in suitable nesting habitat during its breeding season. If a permanent territory was presumed through song at the same location on at least two occasions seven or more days apart it qualified as probable breeding. None of the wettest monsoon seasons, however, occurred in the 1993-2000 years during which the Atlas canvassing was done, and it is possible that breeding surveys were not conducted in the area described above in August and September, which is not the breeding period for most bird species.

Although the irregular breeding distribution of Cassin's Sparrows based on rainfall is widely known, there is scant documentation of this phenomenon during Arizona's summer monsoon seasons. For example, in

the 11 years covered by the Arizona-New Mexico listserv (Archives 1995-2006), there were no reports of any influx of this species beyond its regular breeding areas until 2006. Moreover, examining the breeding reports in *North American Birds* and its predecessors for the years with exceptionally wet summers also revealed no mention of the phenomenon. The National Weather Service (2006) lists in order of wetness 1964, 1955, 1921, 1983, 1919, 2006, 1984, 1990, 1966, and 1954 as the 10 wettest summers in the Tucson area. Leaving aside 1921 and 1919, which occurred before *North American Birds* or its predecessors began publication, the summer and fall seasonal reports for the other seven years were reviewed. Comments on Cassin's Sparrow appeared in the summer reports of 1964 and 1966. In 1964 the report stated, "found in greater than usual numbers were Cassin's and Botteri's Sparrows; both more numerous than ever before in the grasslands of southeastern Arizona from Bisbee to Sonoita, Tucson, Nogales, and Douglas" (Snider 1964). In 1966 Botteri's and Cassin's Sparrows "were singing near Nogales and Elgin at least by June 4" (Snider 1966). Neither of these reports noted any expansion of Cassin's Sparrows north of Tucson. However, in Maricopa County this sparrow is described as a casual and irregular visitor following exceptional rainy periods in late summer (Witzeman et al. 1997). In July-September 1974 up to 15 were singing in the Painted Rock Dam area and 1-2 at sewage ponds in Chandler. Single birds were singing in late summer of 1975 in Tempe and 1992 again in Chandler (Janet Witzeman, letter to author, April 2008). They were also documented in several semidesert grassland locations in southern Yavapai County during the *Atlas* surveys (Corman 2005).

Absent more data, it is unknown whether expansions of Cassin's Sparrows occurred in peripheral habitat areas in the wettest years or whether these expansions were simply not observed or reported. Many semidesert grassland areas in central and southeastern Arizona receive little to no attention by birders and may periodically attract these sparrows when seasonal habitat conditions are appropriate. Hopefully this brief summary of my observations of the 2006 expansion will contribute to our knowledge of this species' intriguing breeding patterns and stimulate more reports during high precipitation years.

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LITERATURE CITED

AZ/NM Listserv. 1995-2006. Archives. BIRDWG05@Listserv.Arizona.Edu.

Corman, T.E. 2005. Cassin's Sparrow (*Aimophila cassinii*). In *Arizona Breeding Bird Atlas* (T. Corman and C. Wise-Gervais, eds.). University of New Mexico Press, Albuquerque.

Dunning, J. B., Jr, R. K. Bowers Jr., S. J. Suter, and C.E. Bock. 1999. Cassin's Sparrow (*Aimophila cassinii*). In *The Birds of North America,* No. 470. (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia.

Monson, G., and A. R. Philips. 1981. *Annotated Checklist of the Birds of Arizona*. University of Arizona Press, Tucson.

Ohmart, R. D. 1966. Breeding record of the Cassin's Sparrow in Arizona. *Condor* 68:400.

National Weather Service, Tucson. 2006 Weather Review. www.wrh.noaa.gov/twc/climate/2006.php.

Philips, A. R. 1944. Status of Cassin's Sparrow in Arizona. *Auk* 61: 409-412.

Philips, A. R., J. Marshall, and G. Monson. 1964. *The Birds of Arizona*. University of Arizona Press. Tucson.

Philips, S.J. and Comus P.W., eds. 2000. *A Natural History of the Sonoran Desert.* Arizona-Sonora Desert Press. Tucson.

Schanse, J. L., W. E. Grant, T. C. Maxwell, and J. J. Leggett. 1991. Time and energy budgets of Cassin's Sparrows (*Aimophila cassinii*) during the breeding season: evaluation through modelling. *Ecological Modelling* 55 (3-4): 285-319.

Snider, P. R. 1964. The Summer Season. *Audubon Field Notes* 18 (5). National Audubon Society.

—.1966. The Summer Season. *Audubon Field Notes* 20(5). National Audubon Society.

Witzeman, J. R., S. R. Demaree, and E. L. Radke. *Birds of Phoenix and Maricopa County, Arizona*. 1997. Maricopa Audubon Society.

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