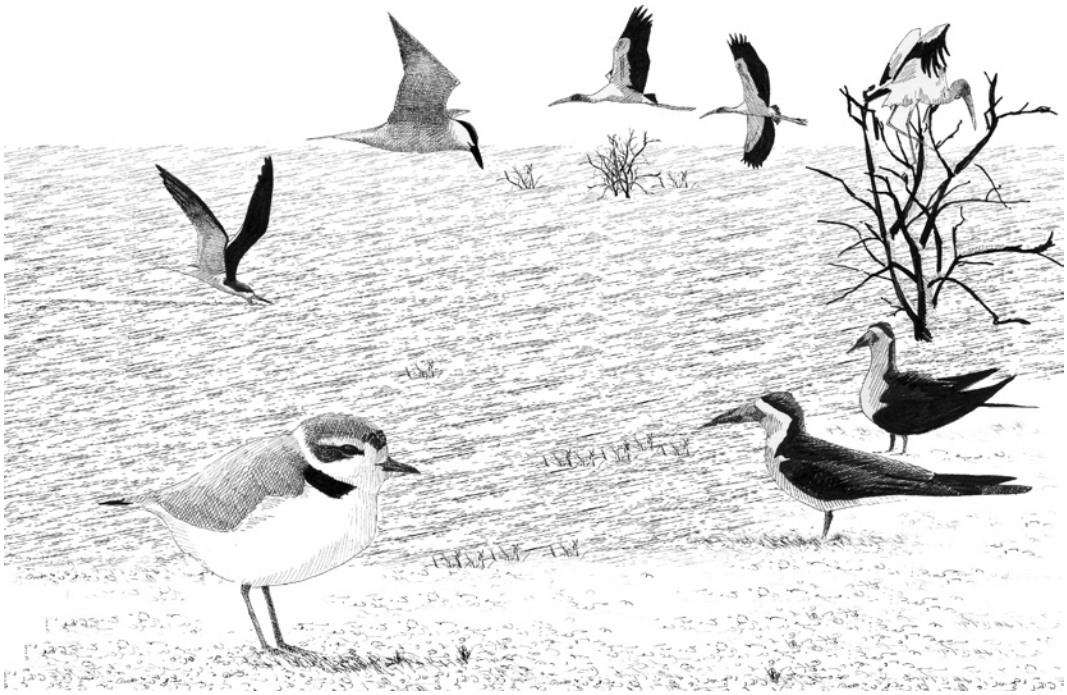
II

Species Accounts



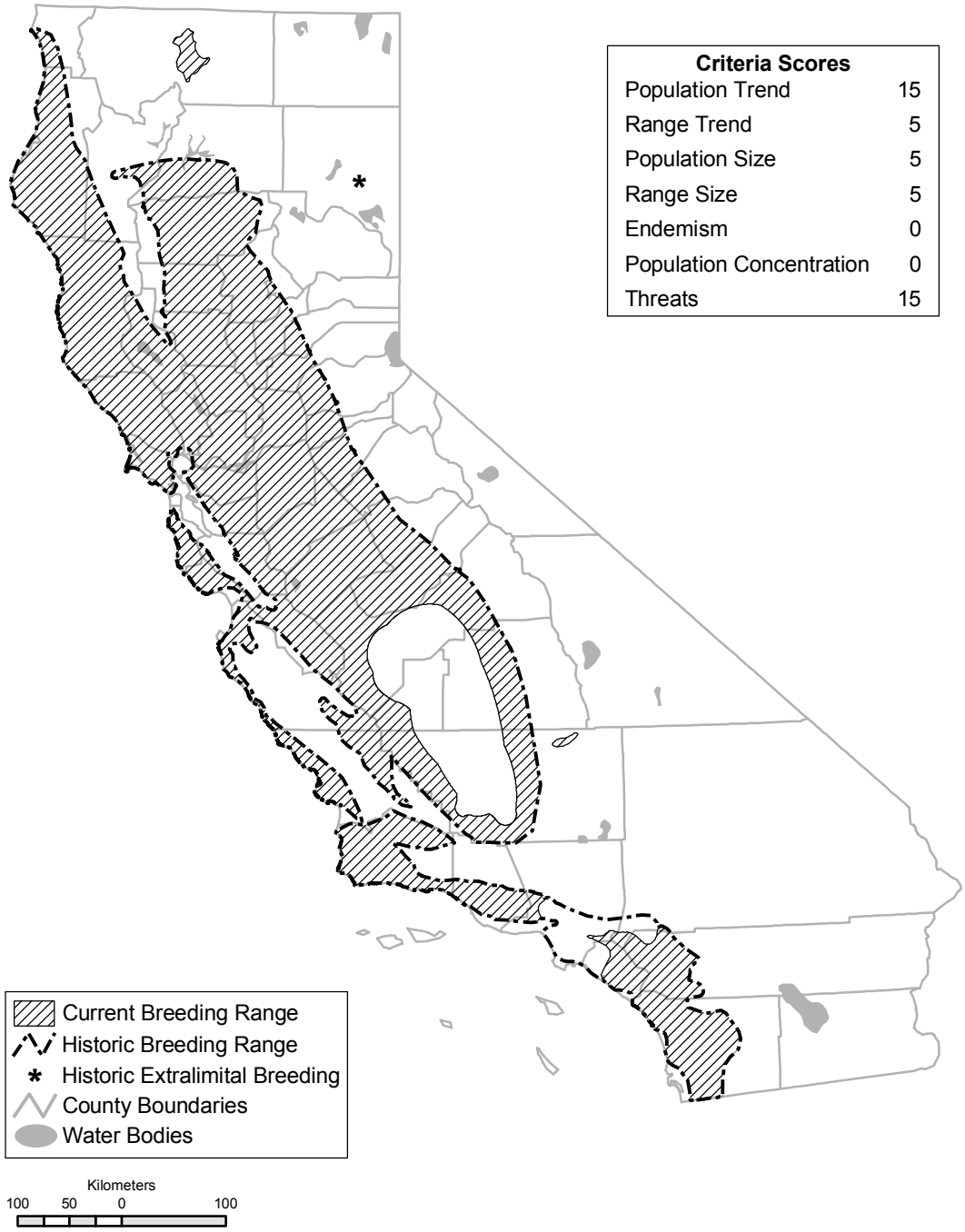
Andy Birch

PDF of Grasshopper Sparrow account from:

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

GRASSHOPPER SPARROW (*Ammodramus savannarum*)

Philip Unitt



Current and historic (ca. 1944) breeding range of the Grasshopper Sparrow in California. Numbers of breeders have declined greatly, particularly in the Central Valley (where very local, especially on the valley floor) and along the southern coast. Retreats from northern areas in winter, when it appears to occur regularly in the state only on the southern coastal slope, though the winter range is ill-defined because of the species' secretive habits.

Special Concern Priority

Currently considered a Bird Species of Special Concern (breeding), priority 2. Not included on previous special concern lists (Remsen 1978, CDFG 1992).

General Range and Abundance

Occurs across North America and ranges from southern Canada disjunctly south to Ecuador. Of twelve subspecies currently recognized, four breed in North America (Vickery 1996). *A. s. perpallidus* occurs very patchily from the Pacific coast, including California, east to the Great Plains. Regarded as "rare" and local in Oregon (Gilligan et al. 1994) and endangered in British Columbia (Cannings 1991). Common only in the Great Plains, but numbers even there are declining with loss of habitat, conversion of pasture to row crops, and fire suppression (Vickery 1996).

Seasonal Status in California

The Grasshopper Sparrow occurs in California primarily as a summer resident from March to September (Garrett and Dunn 1981, McCaskie et al. 1979); the breeding season extends from mid-March to August (Collier 1994). The winter status of this secretive species is obscure, though it is generally considered rare and appears with greatest frequency on the coastal slope of southern California (Grinnell and Miller 1944; 55 winter records for San Diego atlas, Unitt 2004; CBC maps). The Grasshopper Sparrow is at least partly migratory; the occasional birds seen in winter at breeding localities may not be the same individuals there in spring and summer.

Historic Range and Abundance in California

Grinnell and Miller (1944) described the Grasshopper Sparrow as a summer resident from Mendocino, Trinity, and Tehama counties south, west of the Cascade–Sierra Nevada axis and southeastern deserts, to San Diego County, from sea level to 4900 ft (1494 m), as in the San Jacinto Mountains. The only suggestion of breeding in the Great Basin is a 13 July 1928 record of a fully fledged young at 4500 ft (1372 m) in Pete's Valley, Lassen County (Grinnell et al. 1930), which might have represented an extralimital breeding record or evidence of postbreeding dispersal across the mountains. Willett (1912) considered the Grasshopper Sparrow "fairly common" though local on the southern coast of California, but Grinnell and Miller (1944) designated it "sparse and irregularly distributed" overall in the state and noted its semicolonial nature and variable occurrence from year to year. They noted winter occurrence was mainly in the western lowlands, chiefly in southern California, with records extending north to Fresno County and perhaps to the San Francisco Bay region.

Recent Range and Abundance in California

Although further work has expanded areas of known occurrence, the overall outline of the breeding range today is probably similar to that in 1944 (see map). More thorough knowledge has extended the range farther northwest, into Humboldt (Hunter et al. 2005) and Del Norte counties (as far at Point St. George; Harris 2005), and north, into the Shasta Valley, Siskiyou County (R. Ekstrom pers. comm.), and has filled in many interstices among the locations listed by Grinnell and Miller (1944). Still, numbers have declined and the species has been extirpated locally and regionally, particularly on the floor of the Central Valley and in parts of the southern coast. Agricultural and urban development have left the Grasshopper Sparrow's naturally patchy California range even more fragmented. However, the extent of grasslands in California before 1769 is unknown, and at least one author suggested that areas currently dominated by non-native annual grasses were formerly dominated by vegetation types other than grassland, such as various scrub communities (Hamilton 1997). Regardless, loss of grasslands, native or non-native, has been great (see discussion in CalPIF 2000). Breeding Bird Survey data suggest populations of this sparrow in California were stable from 1968 to 2004, but

Breeding Bird Survey Statistics for California

1968–2004					1968–1979			1980–2004			All data from Sauer et al. (2005)
Trend	*P*	*n*	(95% CI)	R.A.	Trend	*P*	*n*	Trend	*P*	*n*	Credibility
2.1	0.21	30	–1.1, 5.3	0.29	8.9	0.67	9	–6.9	0.09	27	Medium

there appears to have been a marginally significant decline from 1980 to 2004 (Sauer et al. 2005).

The Grasshopper Sparrow's current breeding status is described below by subregion of the state, though information is very limited for some of them.

Northeastern California. Recent observations of Grasshopper Sparrows, including multiple individuals at single sites, indicate the species is a "rare" breeder in the Shasta Valley area of Siskiyou County (R. Ekstrom pers. comm.). It is unclear whether a record of three singing birds at McKenzie Meadow, Lassen County, on 5 July 1984 (H. Green in litt.) represents a regular outpost of the breeding range, an extralimital breeding attempt, or postbreeding movement to that area.

Sierra Nevada. Very little is known about the status on the west slope of these mountains. Gaines (1992) reported apparent nesting in the mid-1980s at 4600 ft (1402 m) at Akerson Meadow, Tuolumne County, and at 4400 ft (1341 m) at Big Meadow, Mariposa County, and speculated that birds probably usually nest at lower elevations and move to higher meadows during droughts. Grasshopper Sparrows occur regularly in the breeding season in the South Fork Kern River Valley, Kern County, at the base of the southern Sierra (B. Barnes pers. comm.).

Central Valley and foothills. Agriculture and urbanization have greatly reduced numbers of Grasshopper Sparrows in the Central Valley, but anecdotal evidence indicates they still breed very locally, primarily at the edges and in low foothills but also very sparingly on the valley floor. To the north, these sparrows have been recorded breeding in the past 10 years in the Igo/Ono and Parkville Road/Millville Plains areas of southern Shasta County (B. Yutzy in litt.). Three Grasshopper Sparrows were singing at a native grassland restoration site on the Llano Seco Unit of the Sacramento River NWR, Butte County, on 6 May 2006 (J. Silveira in litt.). The Sacramento County atlas project, covering portions of the southern Sacramento Valley and the Sacramento–San Joaquin River Delta, did not record this species during fieldwork 1988–1992 (T. Manolis in litt.). Starting in 1993 and 1994, numbers increased in Sacramento County (southeastern grasslands, Cosumnes) and elsewhere in the Central Valley (Manolis 1998). Breeding has been confirmed or suspected on the valley floor at Cosumnes River Preserve, Sacramento County, and the Yolo Bypass WA, Yolo County (fide T. Manolis, J. Davis). This sparrow also still occurs as a breeder on the floor of the San Joaquin Valley at Los Banos WA, North Grasslands WA, and San Luis NWR, Merced County, and at Mendota WA, Fresno County. A successful breeding attempt was documented in Los Banos WA in 2000 (B. Allen in litt.). A singing male and juvenile were photographed in an alfalfa field in Madera County about 13 km northeast of the town of Mendota, Fresno County, on 18 July 2006 (G. Woods fide J. Davis in litt). To the south, there has been no evidence of breeding on the valley floor of the Tulare Basin in the southern San Joaquin Valley for decades.

Some representative locales of records on the margins of the Central Valley or in the adjacent foothills, not all of which are occupied annually, are Dye Creek Ranch, Tehama County (B. Deuel in litt.); northwest of Maxwell, Glenn County (fide B. Deuel); Spenceville WA, Yuba County (Manolis 1998); Corral Hollow, San Joaquin County (W. Holt in litt.); Del Puerto Canyon, Stanislaus County (fide J. Davis); near Porterville, Tulare County (R. Hansen in litt.); Tar Canyon above Avenal, Kings County (L. Cole in litt.); and Elk Hills, Kern County (J. Seay in litt.). Though Grasshopper Sparrows generally are still rare in the Central Valley, many more areas of occurrence likely would be documented with concerted effort.

California coast. Along California's humid north coast, the Grasshopper Sparrow is found in prairies and pastures scattered in a largely forested landscape (Harris 2005, Hunter et al. 2005). Still, the Humboldt County atlas project found the species in 12% of the total atlas blocks, and the compilers judged that the county's breeding population likely consisted of "at least many hundreds of birds" (Hunter et al. 2005). Suitable habitat becomes more widespread to the south.

Despite variable coverage and amounts of grassland from county to county, the multiple county atlases in the San Francisco Bay area and central coast provide good information on the relative distribution of this species in this region. Grasshopper Sparrows were recorded in 43% of all blocks in Marin (Shuford 1993), 11% in Sonoma (unrecorded in county until 1975; Rudesill 1995), 2% in Napa (1st county records; Berner et al. 2003), 20% in Contra Costa (unpubl. data), 20% in Alameda (unpubl. data), 0% in San Francisco (unpubl. data), 55% in San Mateo (Sequoia Audubon Society 2001), 26% in Santa Clara (unpubl. data), 8% in Monterey (Tenney 1993), and 8% in San Luis Obispo (unpubl. data). Collectively, these atlases show the species is still fairly widespread both along the coast and in the

Diablo, Gabilan, and Temblor ranges. Published assessments of relative abundance in this region range from "fairly common" (Shuford 1993) to "uncommon" (Tenney 1993).

In coastal southern California, the Grasshopper Sparrow has retreated greatly. Lehman (1994) considered the species "uncommon and local" in summer and noted declines in Santa Barbara County. In Ventura County, it occurs at least in the hills north of Simi Valley and in the Rancho Sierra Vista/Satwiwa unit of the Santa Monica Mountains National Recreation Area and is probably more widespread, with some possibly suitable habitat not readily accessible or recently surveyed (W. Wehtje pers. comm.). The Los Angeles County atlas found the species in only seven blocks: three in the extreme west near the Ventura County line, four in the southeast in the Whittier/Puente Hills (unpubl. atlas data; see Cooper 2000). In Orange County, Hamilton and Willick (1996) considered the Grasshopper Sparrow still "fairly common" and local in the extensive remaining grasslands, including portions of the San Joaquin Hills and foothills of the Santa Ana Mountains, but Gallagher (1997) noted that the species had already been eliminated from 4 of 20 (18% of total) atlas blocks where it was located in the late 1980s. It is gone from the northwestern half of Orange County. On the coastal slope of San Bernardino County, the Grasshopper Sparrow was probably extirpated by 2005, no longer found at the last known sites, the Crafton Hills north of Yucaipa and on the north side of California State University, San Bernardino. In western Riverside County, the Grasshopper Sparrow occurs most consistently at the Santa Rosa Plateau Ecological Reserve but also, at least irregularly, at Lake Matthews, Lake Skinner, Hidden Valley WA near Norco, Moreno Valley, Menifee, Murrieta, and Temecula. But as of 2005 many of those sites were being developed (C. McGaugh pers. comm.). The San Diego County bird atlas recorded the species as possibly breeding in 20% of total blocks, largely restricted to five disjunct areas (Unitt 2004). Many sites support only a few birds and many others have been lost to urbanization in the past 25 years. Much of the remaining population is on military bases, Camp Pendleton and Miramar Air Station.

Ecological Requirements

The Grasshopper Sparrow's ecology varies substantially from region to region within its wide range, and although it has received substantial study elsewhere, it has received very little in California. Thus it is difficult to assess what aspects of the species' biology apply here. In general, however, Grasshopper Sparrows in California prefer short to middle-height, moderately open grasslands with scattered shrubs. Grinnell and Miller (1944) listed a variety of generalized grassland-like habitats, including alfalfa. Dawson (1923) mentioned a nest near Escondido in an alkaline meadow covered with saltgrass (*Distichlis*). Often the sparrow's habitat in this area is an ecotone between grassland and sage scrub, so there are scattered shrubs such as California Buckwheat (*Eriogonum fasciculatum*) or California Sagebrush (*Artemisia californica*), used by the birds as song perches (pers. obs.).

In some parts if the sparrow's California range, native bunchgrasses appear to be important habitat components (e.g., San Diego, Unitt 2004), although this is probably not the case in most of the state, given that non-native annuals dominate most grasslands. In Riverside County's Santa Rosa Plateau Ecological Reserve, the presence of native grasses was less important than the absence of trees (Collier 1994). These sparrows generally are absent from areas with extensive shrub cover, though some shrubbery is tolerated and perhaps preferred (Johnston and Odum 1956, Bock and Bock 1992, Vickery 1996). Patchy bare ground has also been noted as an important habitat component elsewhere (e.g., in Arizona, Bock and Webb 1984; in West Virginia, Whitmore 1981). The Grasshopper Sparrow is more likely to be found in large tracts of habitat than in small ones (Vickery et al. 1994); minimum area requirements are about 100 ha in Maine (Vickery et al. 1994), 30 ha in Illinois (Herkert 1994).

Much remains to be learned about the within- and between-year movement patterns of Grasshopper Sparrows. Shuford (1993) and Tenney (1993) suggested that birds arriving in early spring at dry inland sites may shift later in the season to more humid grassland near the coast. Possibly, the proportion of the population that is nonmigratory increases toward the south. Additionally, it has been noted that Grasshopper Sparrow populations fluctuate between years, perhaps shifting to take advantage of variable habitat suitability caused by annual differences in rainfall or disturbance such as grazing (Wiens 1974, Whitmore 1979).

The year-round diet of the Grasshopper Sparrow continent-wide is roughly 63% animal matter and 37% vegetable (Judd 1901, n = 170 stomachs). Animal matter primarily consists of grasshoppers (Orthoptera); in California plants whose seeds the species is known to eat include

knotweed (*Polygonum* spp.), campion (*Lychnis* spp.), oats (*Avena* spp.), and pigweed (*Amaranthus* spp.; Martin et al. 1951). These sparrows forage primarily on the ground or from low vegetation; bare ground may be important (Vickery 1996).

Grasshopper Sparrows build nests domed with grasses and with a side entrance, typically well concealed in depressions at the base of grass clumps with the rim approximately level to the ground (Vickery 1996). Pairs can raise two broods and will renest following nest failure.

Studies of factors limiting the Grasshopper Sparrow population are lacking. These factors, however, may include amount and quality of existing habitat.

Threats

Urbanization is the primary current threat to the Grasshopper Sparrow. Much of its California habitat lies in the path of expanding cities, especially in southern California and the foothills surrounding the Central Valley. The great expansion of vineyards in the Central Valley and inner Coast Ranges (e.g., Merenlender 2000) is likely removing substantial habitat for this species.

The effect of conversion from native to non-native grasslands on Grasshopper Sparrows is unknown, but in Oregon Grasshopper Sparrows prefer native bunchgrass (Janes 1983, Holmes and Geupel 1998). In the Santa Monica Mountains of Ventura County, W. Wehtje (pers. comm.) notes the invasion of Harding Grass (*Phalaris aquatica*) as a threat to Grasshopper Sparrow habitat.

Depending on degree, the effect of grazing can be negative (Saab et al. 1995) or positive. For example, in humid Oklahoma the species was found only in grazed tallgrass prairie, whereas in arid southeastern Arizona it was eliminated by grazing (Bock and Webb 1984). Behle et al. (1985) ascribed the species' current rarity in Utah to a history of overgrazing. In the Lake Henshaw basin of north-central San Diego County, heavy grazing in combination with pumping out of groundwater confine the Grasshopper Sparrow to a few mesic microhabitats in an area where it would otherwise likely be widespread. Conversely, during the 1990s, the cessation of cattle grazing in Happy Camp Regional Park near Moorpark, Ventura County, led to Coyote Brush (*Baccharis pilularis*) replacing grass and Grasshopper Sparrows disappearing (W. Wehtje pers. comm.).

Fire suppression may also threaten Grasshopper Sparrows if it leads to grassland converting into unsuitable habitats such as dense scrub.

Management and Research Recommendations

- Negotiate conservation agreements (allowing limited grazing, for example, but preserving grassland) or favorable zoning on private land.
- Especially in southern California, ensure that the importance of grasslands is recognized in habitat-conservation plans.
- Redirect urbanization away from native and non-native grasslands.
- Manage as native grassland significant tracts of Grasshopper Sparrow habitat that come into public ownership (like Rancho Jamul in southern San Diego County).
- Minimize or prevent disturbance of the ground surface in native grassland, as this favors exotic weeds at the expense of native grasses. Develop means for restoring native grassland.
- Investigate the effects of fire, by season, on native grassland and Grasshopper Sparrows in California.
- Investigate the species' population density and nesting success in native versus non-native grassland.
- Investigate possible movements of Grasshopper Sparrows in the middle of the breeding season.
- Initiate studies on the use of grazing to provide optimal habitat. For example, it would be good to know what intensity of grazing is most suitable to abundance, reproductive success, and site fidelity. Assess the relationships among grazing intensity, local rainfall, and Grasshopper Sparrow use of habitat.
- Initiate a study to determine the current distribution and relative abundance of Grasshopper Sparrows in the Central Valley. Further, determine which vegetation characteristics predict occurrence and abundance there.

Monitoring Needs

Because of the Grasshopper Sparrow's widely dispersed distribution, a complete census is not possible. Rather, a network of survey routes, randomly selected, scattered throughout the species' range is needed if the population level is to be monitored. The number of sites monitored should be large, to average out the effect of the species' irregularity, and should include a range of habitats occupied under varying climatic conditions.

Monitoring of the birds should be linked to monitoring of habitat conditions so the effects of changes in these can be better identified. Ideally, monitoring will occur annually. The line transect method, ideal for open habitats (Burnham et al. 1980, Bibby et al. 1992), should be considered as the survey method for this species, and all species present in sampled grasslands should be surveyed simultaneously.

Acknowledgments

Thanks to B. Allen for reviewing this account and to T. Gardali and W. D. Shuford for help with revisions.

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