

## Grasshopper Sparrow (*Ammodramus savannarum*)

### Legal Status

*Federal:* None

*State:* Species of Special Concern



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*Global and State Conservation Status:* G5S2: Global rank, G5 = Secure: Common; widespread and abundant; State rank, S2 = Imperiled: Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.

*Recovery Plan:* None

### Species Description and Life History

Grasshopper sparrows (*Ammodramus savannarum*) are short to medium-distance migrants that nest primarily in the eastern half of the United States, and winter in southern United States, Mexico, and northern Central America (Vickery 1996). Small breeding populations are also found in scattered locations in the western states, including California (Vickery 1996). Grasshopper sparrows are small, large-headed, flat-crowned and short-tailed, and are the only small grassland sparrows with unstriped breasts.

### Seasonal Patterns

In California, grasshopper sparrows arrive on their breeding territories from March to mid May, depending on location (Vickery 1996). In Yolo County, most breeding season records have been from late-March until late May, scattered non-breeding records from January, September, October, November, and December (Yolo Audubon Society Checklist Committee 2004).

### Reproduction

Females lay three to six eggs and incubate them for 11–13 days. Both parents and, occasionally, related adult and juvenile helpers feed the nestlings, which remain in the nest for 8–9 days. Grasshopper sparrows frequently reneest in response to nest predation; rates may exceed 50%. Rates of brown-headed cowbird (*Molothrus ater*) brood parasitism are reportedly lower for grasshopper sparrow than for other grassland bird species, presumably because grasshopper sparrow nests are more difficult to find (Vickery 1996).

### *Home Range/Territory Size*

Grasshopper sparrows often nest semi-colonially in clusters of territories (Grinnell and Miller 1994; Vickery 1996). Reported mean territory sizes vary considerably throughout the species' distribution and range from 0.19 to 1.40 hectares (0.47 to 3.46 acres) (Vickery 1996). Populations in Maine require habitat patches greater than 100 hectares (247 acres) (Vickery 1996). Territory sizes and habitat patch requirements have not been studied in California.

### *Foraging Behavior and Diet*

Grasshopper sparrows forage primarily for grasshoppers, but other insects, including bees and wasps, beetles, and caterpillars, are also eaten. Studies have shown that insects account for 61% and 29% of the summer and fall diets, respectively. The remainder of the diet is comprised of seeds. Stomach analysis in California (N = 8) found seeds from knotweed (*Polygonum* spp.), campion (*Lychnis* spp.), oats (*Avena* sp.), and pigweed (*Amaranthus* spp.) (Vickery 1996).

## **Habitat Requirements and Ecology**

### *Nesting*

In California, grasshopper sparrows require dry, well-drained grasslands with patches of bare ground (Grinnell and Miller 1944). These grasslands often include scattered, taller shrubs or annuals that are used for song perches (Grinnell and Miller 1944; Vickery 1996; *In press*). They breed in a variety of grassland habitats including native bunchgrass, wild rye, wet meadows with a variety of forbs, annual grasslands with scattered shrubs, and rarely in pasturelands and annual grasslands dominated by star thistle (J. Sterling pers. obs.). Although they often occupy hillsides, they may also occur in flat terrain (J. Sterling pers. obs.). In California and perhaps elsewhere, grasshopper sparrows are most often found in clusters of breeding territories resulting in clumped distribution leaving much seemingly available habitat unoccupied (J. Sterling pers. obs.). Winter habitat may differ from breeding habitat, but there are too few records of wintering birds in the Central Valley to adequately describe their winter habitats.

### *Foraging*

Grasshopper sparrows primarily forage on the ground within or near their breeding territories (Vickery 1996).

## Species Distribution and Population Trends

### *Distribution*

Grasshopper Sparrows breed throughout the United States east of the Rocky Mountains, and in scattered locations in the western states, in southern Mexico and the Greater Antilles (except for Cuba), as well as in Columbia and Ecuador. They winter primarily in grasslands in the southeastern United States, Mexico, Cuba, and northern Central America (Vickery 1996).

Grinnell and Miller (1944) described the Grasshopper Sparrow's occurrence in California as "sparse and irregularly distributed" from Mendocino, Trinity, Shasta, and Lassen Counties south to San Diego County and west of the Sierra Nevada and desert regions. Grasshopper sparrows are now known from Del Norte and Siskiyou Counties and many additional areas that were unknown to Grinnell and Miller (Sterling pers. comm.). However, their statewide distribution is still best described as sparse and irregular.

### *Population Trends*

Breeding Bird Survey data are inadequate to assess population trends throughout the species' range (Sauer *et al.* 2001). Regional population trends are related to land use. For example, an 85% decline occurred in Illinois during the past 35 years due to conversion of pasture to row crops. A severe decline was also noted in Florida due to conversion of native prairie to agriculture, and an increase was observed in South Carolina, perhaps due to an increase in pasture (Vickery 1996).

Grasshopper Sparrow populations around metropolitan areas in southern California have significantly declined in recent decades (Unitt 2008). These declines are a result of loss of habitat through conversion of grasslands to agriculture and suburban/urban development, and habitat degradation from overgrazing and invasion plants (Vickery 1996; Unitt 2008). Because the Central Valley region's current and historic breeding distribution is not clearly known, and current and historic population sizes have not been estimated, population trends are unknown.

### *Distribution and Population Trends in the Plan Area*

In Yolo County, they are considered rare and irregular (not annual) breeders in the Yolo Bypass and the grasslands in the lower foothills. Breeding season localities where they have been observed historically include along County Road 105 and near Pleasant's Valley Bridge, and breeding season records since 1999 include "Longspur Corner" near the Dunnigan Hills, along County Road 88, near the intersection of County Roads 27 and 96, and at the Grasslands Regional Park (Yolo Audubon Society Checklist Committee 2004).

### **Threats to the Species and Other Conservation Issues**

The primary population threats to this species come from development of grasslands for housing and commercial buildings. Grasshopper Sparrows avoid highly fragmented grasslands in California and elsewhere (J. Sterling pers. obs.; Vickery 1996). Fragmentation reduces the ability of an area to sustain a population, leading to local extirpations and the loss of source populations.

Available breeding habitats for the Grasshopper Sparrow may also be degraded by poorly managed livestock grazing and by invasive non-native plants. Early season mowing of breeding sites may also destroy nests (Vickery 1996). Hay and grass mowing during the nesting season (conducted earlier in spring now than was done historically) has resulted in nest failure and mortality of young and/or eggs (In press; Vickery 1996).

Predation on adults by loggerhead shrikes (*Lanius ludovicianus*) and on nestlings by corvids, snakes, and a variety of mammals may significantly affect small populations. Nest predation rates are higher near woodlands and brush fields due increased to exposure to avian and mammalian predators (Vickery 1996).

Significant data gaps relating to many aspects of the life history of the Grasshopper Sparrow exist. Data gaps include specific effects of habitat fragmentation or degradation, minimum patch size, sources of mortality, mating system dynamics, winter ecology and distribution, and population structure.

Many large grassland areas in Dunnigan Hills, Capay Valley and Central Valley appear to be unoccupied, but apparently represent suitable habitat for Grasshopper Sparrow (J. Sterling pers. obs.). In addition, factors determining local population fluctuations need to be fully understood in order to guide effective management actions to increase and stabilize populations at local carrying capacity.

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### **References**

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### **Personal Communication**

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