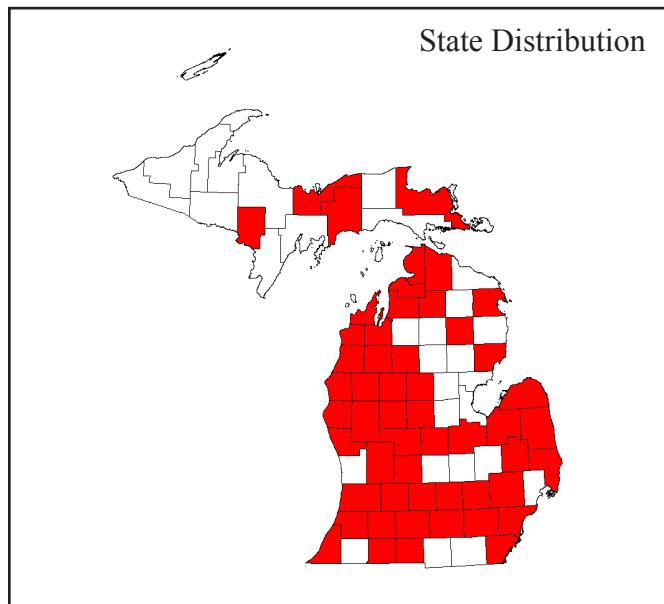




Photo by Daniel Behm



Status: State special concern

Global and state rank: G5/S3S4

Family: Emberizidae (New World sparrows, towhees, and Old World buntings)

Total range: There are a total of twelve subspecies of grasshopper sparrow in the Americas, four of these subspecies recognized for North America. *Ammodramus savannarum-pratensis* is the eastern form; *A. s. ammolegus* is a southwestern form; *A. s. perpallidus* is the broadly ranging western form; and *A. s. floridanus* is a federally endangered non-migratory form found only in Florida (Bulgin et al 2003). The eastern form breeds from southern Ontario south to Georgia and from New England west to Wisconsin and Oklahoma. The Western form breeds discontinuously from Southern British Columbia to Southwestern California, Nevada and central Colorado to central Texas. The Southwestern form breeds in Arizona, and the Florida form breeds exclusively in central Florida (Savignac et al. 2011).

State distribution: In Michigan, grasshopper sparrows were historically considered rare and local. As forests were cleared in the early 1900s, the species increased in abundance, especially in the southern Lower Peninsula (Beaver 1991). In recent decades, populations have been

declining, especially in the southern Lower Peninsula. Grasshopper sparrows have been confirmed in the majority (53) of Michigan counties, but occur at relatively low frequencies (Michigan Natural Features Inventory 2014). It is likely, however, that grasshopper sparrows are present in other counties, but official records have not been obtained. Presently, the majority of sightings occur in on the Northwest side of the state, in counties along Lake Michigan (eBird 2014; Gibson 2011). While seemingly ubiquitous, this species is uncommon and local due to its habitat requirements and the conversion of suitable habitat to cultivated row crops.

Recognition: The Grasshopper sparrow is among the smaller sparrows at 4–5 inches (10.3–13 cm) in length, brown above with buff streaking, an unmarked buff-colored breast, and a white belly. The head is flat with a white stripe running from the relatively large bill to the back of the head. The lores (the space between the eyes and the bill) are orange or golden, and the tail is brown. The juvenile form has dark brown vertical streaking on its side and buff breast. It is the only grassland sparrow that lacks wing bars. This bird, although secretive, is easily identified from a distance by its high pitched insect-like buzzy song “tik-tuk tikeeeeeeez”. The initial “tik” sound is more subdued and may not be heard on windy days or from significant distances.



Best survey time: The best time to survey for grasshopper sparrows in Michigan is between late April and mid-September. Surveys for breeding birds should be conducted between mid-May and late July.

Habitat: Grasshopper sparrows may be found in a wide variety of grassland habitats, cultivated fields, hayfields and old fields; and habitat selection varies by region. In the Midwest, they seem to prefer dry sites as long as the vegetation is grassy, dense and relatively tall. They especially prefer areas where vegetation is clumped with interspersed areas of bare ground that facilitate foraging of insects (Dechant et al. 2002). They also tend to be found in areas with moderately deep litter and a low percentage of woody vegetation. They are not obligated to native grasslands, and will readily breed in old fields, hayfields and cultivated fields (although the last to a lesser degree). Grasshopper sparrows can be area-sensitive, as well. Several studies have found that large areas are preferred over small areas (Vickery et al. 1994; Bollinger 1996; O'Leary and Nyberg 2000). In most regions, it appears that grasshopper sparrows prefer suitable habitat to be in the range of 25– 75 acres (10-30 ha), despite having territories that average 5 acres (2 ha) (Delisle and Savage 1996).

Biology: Grasshopper sparrows are short distance migrants with summer and winter ranges within the U.S. and Canada. Most eastern form grasshopper sparrows migrate south to an area ranging from Louisiana to Georgia and Florida north to North Carolina. Many eastern subspecies winter migrants occupy the same winter habitat as the non-migratory Florida subspecies. In Michigan, grasshopper sparrows arrive at breeding grounds in late April, but have been observed as early as mid-April (eBird 2014).

Males tend to arrive at the breeding grounds five to 10 days before females (Vickery 1996). The breeding season begins in May and usually lasts for approximately 90 days. For migratory subspecies, pair formation occurs at the breeding grounds. Grasshopper sparrows are generally accepted to be monogamous, but there is some evidence to show they may be polygynous under certain circumstances. Nests are built by females immediately after pair formation and eggs are produced in late May or early June (Vickery 1996). Nests are built on the ground, usually at the base of grass clumps. Overhanging grasses are often domed above with an entrance on the side. Material is gathered from the

nest site, and nests are usually completed in 2-3 days (Harrison 1975). Grasshopper sparrows have been observed renesting up to 4 times in a season if clutches are lost (Vickery 1996). Nests are not reused in subsequent nesting attempts. Eggs are generally a creamy white color and lightly speckled reddish-brown. Four or five eggs are typically laid and are incubated for 11-13 days solely by the female (Smith 1968). Young grasshopper sparrows remain in the nest for approximately nine days. Both parents equally feed young while in the nest. Non related birds whose nests have failed will also supply food for chicks (Kaspari and O'Leary 1988). Nestling diet consists mainly of butterfly and grasshopper larvae. Two broods are frequently produced, although to a lesser degree in the northern parts of their range. In Michigan, grasshopper sparrows begin southern migration in mid-September, but records show some birds linger until early October (eBird 2014).

Conservation/management: Grasshopper sparrow populations have been declining throughout its range, including a notably drastic decline in portions of the Midwest. Illinois estimates an 85% decline in grasshopper sparrow populations since the late 1960s (Herkert 1994). The U.S. Fish and Wildlife Service has identified grasshopper sparrows as a “species of management concern” for Region 3, which includes Michigan (U.S. Fish and Wildlife Service 1995). The likely cause of this dramatic decline was initially habitat loss as native grasslands were converted to agricultural fields. More recently, particularly in the Midwest, changes from hay production and grazing to more specialized row crop production account for a loss of breeding habitat for grasshopper sparrows.

There are also other factors contributing to the declining grasshopper sparrow population. Fragmentation and urbanization have created smaller and more disjunct areas of suitable breeding habitat. Untimely mowing of larger areas (such as hay fields) also causes increased mortality rates of young. Encroachment of woody vegetation combined with overgrazing in large areas has shown to decrease habitat suitability. Nest parasitism by brown-headed cowbirds (*Molothrus ater*) has also likely played a role in the population decline of grasshopper sparrows, although not to the extent in the Midwest as it has in the plains states (Friedmann 1963; Robinson et al 2000). Other threats include habitat loss or degradation in wintering grounds due to a reduction of fire management, urbanization and drainage. The impact of pesticides



on food sources is also detrimental in both winter and breeding grounds (McIntyre and Thompson 2003).

There are many management options available to promote grasshopper sparrow population stabilization and reestablishment in Michigan. The three most commonly used and recommended management tools are prescribed burning, mowing, and grazing. Prescribed burning is an excellent tool for maintaining grassland habitats. However, burns must be appropriately timed. Grasshopper sparrow habitat should be burned outside of the breeding season, preferably in the fall, after grassland birds have migrated south (Hovick et al 2012). This will benefit not only grasshopper sparrows, but also other grassland bird species of concern, such as the Henslow's sparrow (*A. henslowii*), dickcissel (*Spiza americana*) and bobolink (*Dolichonyx oryzivorus*). Generally, breeding grasshopper sparrows do well on grasslands that have had more than one year to recover from a burn (Hovick et al 2012). Because of this tendency, instituting a rotation burn schedule at a site is ideal. Burning not only provides renewed vigor to grassland plants, but also can help to diminish the presence of woody species, which decreases habitat quality for grasshopper sparrows and other grassland birds.

Appropriately timed mowing can increase habitat quality for grassland birds by decreasing the presence of woody vegetation and promoting litter cover. However, poorly timed mowing (i.e. early season mowing) can cause high rates of nest failure for multiple grassland bird species and should be strongly avoided where management for grassland birds is a priority. Grazing is sometimes used as a substitute for mowing. Grazing pressure must be routinely monitored to ensure adequately tall and dense vegetation (Hovick et al 2012). Additional removal of encroaching woody vegetation is useful in any management scenario to prevent the conversion of open areas to forest (Drilling 1985). Finally, the restriction of pesticide use will protect the prey base for many grassland bird species in suitable habitat.

Research needs: Documentation of grasshopper sparrow occurrences on both public and privately managed areas is a high priority. Identifying and characterizing habits and phenology will also aid in management and monitoring projects. A greater understanding of site and mate fidelity and winter habitat selection is also merited. Additional study of reproductive success rates in relation to various management techniques would greatly

benefit land managers making on the ground decisions. Finally, a better understanding of habitat size requirements and the impacts of habitat fragmentation, particularly in Michigan, should also be considered.

Related abstracts: Dry sand prairie, dry-mesic prairie, mesic sand prairie, mesic prairie, pine barrens, oak-pine barrens, oak openings, burr oak plains, rough fescue, eastern prairie fringed orchid, Henslow's sparrow, dickcissel, western meadowlark, short-eared owl, northern harrier.

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Abstract citation:

Norris, R.A. 2014. Special animal abstract for *Ammodramus savannarum* (grasshopper sparrow). Michigan Natural Features Inventory. Lansing, MI. 4 pp.

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Michigan State University Extension is an affirmative-action, equal-opportunity employer.

Funding for abstract provided by the United States Fish & Wildlife Service State Wildlife Grants Competitive Grant Program via the Michigan Department of Natural Resources, Wildlife Division.

