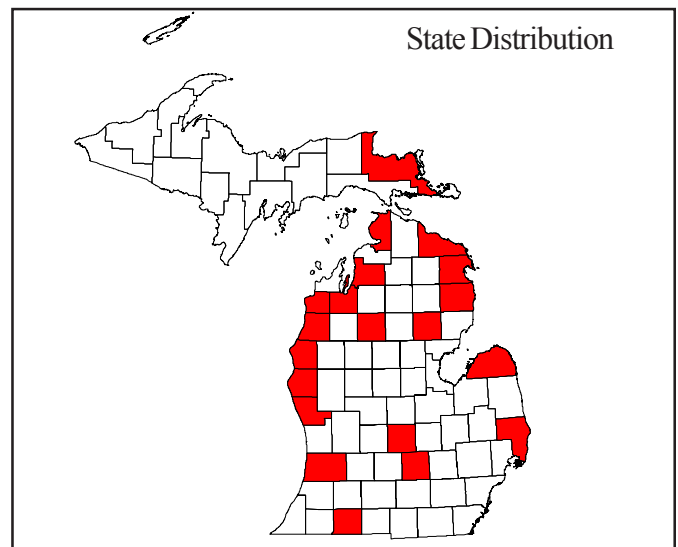
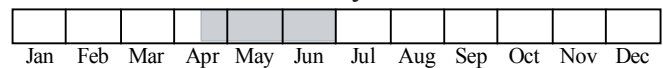




Photo by Kevin T. Karlson



Best Survey Period



Status: State endangered

Global and state rank: G5T3Q/S1

Family: Laniidae (shrike family)

Total range: The loggerhead shrike historically occurred throughout the United States from southern Canada to southern Mexico (Evers 1994). The American Ornithologists' Union (1957) has recognized a total of nine subspecies across the species' range. The migrant loggerhead shrike (*Lanius ludovicianus migrans*), the northeastern and northcentral subspecies, has been known to breed from southeast Manitoba east to the Maritime Provinces in Canada and south to eastern Texas, central Louisiana, western North Carolina and Virginia (Yosef 1996). However, due to population declines in both its breeding and wintering ranges, the migrant loggerhead shrike no longer breeds in the New England states and Canadian Maritime Provinces (Robbins et al. 1986, Yosef 1996). Isolated breeding populations occur in Michigan, southern Ontario and south central Pennsylvania (Cadman et al. 1987, Brewer et al. 1991, Brauning 1992). This subspecies is migratory, and overwinters in the southern half of its breeding range (Yosef 1996).

State distribution: Historic reports indicate the loggerhead shrike was an uncommon bird that was widely distributed throughout the Lower Peninsula and rare and locally distributed in the eastern Upper

Peninsula (Barrows 1912, Wood 1951). During the late 1940's to the late 1960's, loggerhead shrikes were confirmed breeding in at least 22 different counties, primarily in the southern Lower Peninsula, and sighted in a total of 42 counties in the summer in Michigan (Little 1987). However, the loggerhead shrike population in Michigan declined steadily in the 1960's, and by the late 1970's, the breeding population had virtually disappeared from the state (Little 1987, Evers 1994). Since the late 1970's, loggerhead shrikes have had a similar distribution to their historical distribution, breeding in about 20 counties but have occurred in much lower numbers (Brewer et al. 1991, Kielb 1995, Powell 1995, Michigan Natural Features Inventory (MNFI) 2001). Only 21 breeding pairs were documented in the state from 1982 to 1988 during Michigan's Breeding Bird Atlas surveys (Brewer et al. 1991), and only one or two nesting pairs per year were reported sporadically during the 1990's (Granlund 1995). In addition to counties with breeding pairs, summering individuals have been reported recently (i.e., within last 20 years) from Berrien, Kent, Leelanau, Manistee, Montcalm, Ontonagon, and Osceola counties (Little 1987, Reinoehl 1994, Reinoehle 1996, Byrne 2000). Many recent breeding pairs and summering individuals occur within about 10 miles (16 km) of Michigan's shoreline (Little 1991). The loggerhead shrike occasionally may be found wintering in the southern third of Michigan (Payne 1983).

Recognition: The loggerhead shrike is a **grayish, robin-sized bird**, averaging 8 to 10 inches (20 to 25



cm) in length with a wingspan of about 13 inches (33 cm). The **head and back are bluish-gray**, and the **breast and belly are white and faintly barred**. A **broad black mask extends across and slightly above the eyes and above the top of the bill**. The **bill** is black and **slightly hooked**. The rump varies from gray to whitish. The **wings are dark with large white wing patches** and white scapulars or feathers along the base of the upperwing. The **tail also is dark with white along the edges**. Juveniles are brownish-gray and barred overall. This bird is usually quiet, but may be heard repeating short calls that include a harsh “shack-shack” and “queedle-queedle”.

The loggerhead shrike may be confused with the northern mockingbird (*Mimus polyglottus*) and the northern shrike (*Lanius excubitor*). The northern mockingbird lacks the black face mask and large, hooked, black bill. The northern shrike is slightly larger than the loggerhead shrike. The face mask on the northern shrike is narrower than the loggerhead shrike's and does not extend above the eyes or bill. The northern shrike's bill also is longer and has a more distinct hook than that of the loggerhead shrike. Finally, the northern shrike usually only occurs in Michigan during migration, winter and early spring (i.e., mid-September through April), but does not nest and is not known to occur in the state during the summer (Granlund 1995). Therefore, a shrike observed in Michigan from May through August is most likely a loggerhead (Evers 1994).

Best survey time: Loggerhead shrikes typically arrive in Michigan from mid-March to mid-April, and generally leave sometime between August and October, although individuals have been seen as late as December (Wood 1951, Little 1991, Evers 1994, Granlund 1995). The best time to survey for breeding birds is during the incubation and nestling periods (Bartgis and Soule 1992, Luukkonen pers. comm.). In Michigan, this typically is from mid-April through June and into mid- to late July for late nesters and second broods (Wood 1951, Evers 1994). The best way to survey for these birds is by visually observing birds active around nest sites. Birds also can be seen foraging or perched on tree tops and branches, utility lines and poles, and fence posts.

Habitat: Loggerhead shrike habitat consists of grasslands and open, agricultural areas characterized by short vegetation and scattered trees, shrubs or hedgerows for nesting cover and hunting and lookout

perches (Bent 1950, Evers 1994). This species typically prefers pastures, old fields and orchards, roadside fencerows, and native prairies and grasslands (Bent 1950, Brooks and Temple 1990, Little 1991, Evers 1994). This bird also utilizes riparian areas and open woodlands (Yosef 1996) as well as agricultural fields with row crops (e.g., corn, soybeans, etc.) (Bent 1950), mowed roadsides, parks, cemeteries and golf courses (Little 1991). Loggerhead shrikes appear to use similar habitat in the winter as in the summer, particularly idle pastures and hayfields (Bartgis 1992).

Suitable nest trees and perches from which to locate prey are essential components of this species' breeding habitat. Loggerhead shrikes nest in a variety of trees and shrubs, but seem to prefer trees and shrubs with thorns or dense branches, probably to provide protection and concealment from predators (Porter et al. 1975, Luukkonen 1987, Little 1991). Typical nest trees and shrubs include eastern red cedar (*Juniperus virginiana*), hawthorns (*Crataegus* sp.), osage orange (*Maclura pomifera*), multiflora rose (*Rosa multiflora*), honey locust (*Gleditsia triacanthos*), pines (*Pinus* sp.), spruces (*Picea* sp.), firs (*Abies* sp.), willows (*Salix* sp.) and apple (*Malus* sp.) (Bent 1965, Porter et al. 1975, Siegel 1980, Kridelbaugh 1982, Little 1987, Luukkonen 1987, Novak 1989, Gawlik and Bildstein 1990). When trees or shrubs are lacking, loggerhead shrikes also will nest in brush piles (Siegel 1980).

Biology: The loggerhead shrike is one of the earliest nesting passerines (i.e., perching birds and songbirds). In Michigan, loggerhead shrikes arrive at breeding grounds between mid-March and mid-April (Wood 1951, Evers 1994). Males arrive before females, and nearly half the males may reoccupy the same nesting area and the same nest tree or shrub as the previous year (Luukkonen 1987, Evers 1994).

Loggerhead shrikes build open, bulky cup nests, constructed from roots, twigs, grass, forbs and bark strips woven together (Yosef 1996). The inside is lined with soft plant material and animal hair (Luukkonen 1987). The nest is about six inches (152 mm) in diameter and three inches (76 mm) deep (Yosef 1996). Nests are usually placed in a crotch or on a large branch well hidden below the crown and typically over three feet (1 m) from the periphery of the tree or shrub (Novak 1989, Yosef 1996). Average nest height above the ground depends in part on the height of available



shrubs and trees; nest heights in Michigan have ranged from 8 to 15 feet (2.4 to 4.6 m) (Evers 1994).

An average clutch of 4-6 eggs is laid between mid-April and late June (Wood 1951, Evers 1994). The female is primarily responsible for incubation, which usually lasts 13-16 days (Evers 1994). During the incubation period, the male supplies the female with food and aggressively defends the nesting territory with wing-fluttering displays (Bent 1950). Both adults feed the nestlings. An average of three young fledge after 17-20 days and they remain dependent on the adults for food during the first two to four weeks after fledging ((Little 1987, Evers 1994). After this initial period, the fledglings are self-sufficient. Double broods commonly occur in Michigan (Little 1987). During this time, the female abandons the male, who then assumes responsibility for the fledglings (Kridelbaugh 1982). Loggerhead shrikes maintain larger territories than other insectivorous passerines of similar size (Yosef 1996). Mean territory size ranges from 4.6 ha in Missouri (Kridelbaugh 1982) to 13.4 ha in Alberta (Collister 1994).

Loggerhead shrikes exhibit fairly high nesting success (i.e., nests in which ≥ 1 young fledge), averaging 56% (Yosef 1996). However, mortality rates of fledglings, particularly in the first few weeks before achieving full independence, can be fairly significant, ranging from 33-53% in Alberta (Collister 1994) and 46% in Indiana (Burton 1990). Nest failures have been attributed primarily to inclement weather, either damaging nests or reducing food supplies, and predation (Porter et al. 1975, Kridelbaugh 1982, Novak 1989, Gawlik and Bildstein 1990).

As both a passerine and a top-level predator, the loggerhead shrike occupies a unique position in the food chain (Yosef 1996). The loggerhead shrike preys on insects, small mammals, birds, amphibians and reptiles (Bent 1950, Yosef 1996). During the summer, this bird feeds primarily on insects, mostly grasshoppers, crickets and beetles (Bent 1950). However, during the winter and early spring, vertebrate prey, primarily small mammals, make up most of its diet (Kridelbaugh 1982). Loggerhead shrikes prey on small birds (sparrows and warblers) opportunistically, and occasionally take larger birds, such as northern cardinals (*Cardinalis cardinalis*) and mourning doves (*Zenaidura macroura*) (Evers 1994). The loggerhead shrike also feeds on roadkills and carrion (Anderson 1976).

Loggerhead shrikes forage in short grass or other low vegetation, such as farm fields, where it is easier to detect prey (Little 1987). They hunt from perches on treetops, utility lines and poles, fence lines and other elevated vantage points, frequently along roadways. Lacking the strong feet and talons of raptors for holding its prey while feeding, this small avian predator has a unique adaptation of impaling its prey on thorns or barbed wire, earning this bird the nickname "butcher bird." Impaled prey are often only partially eaten, and remains are left in caches throughout a breeding pair's territory (Little 1987).

Few data on predation of loggerhead shrikes and its impact on populations are available (Yosef 1996). Suspected nest and fledgling predators include most carnivores and raptors such as house cats, black rat snake (*Elaphe obsoleta obsoleta*), raccoons (*Procyon lotor*), blue jays (*Cyanocitta cristata*), American crows (*Corvus brachyrhynchos*) and red-tailed hawks (*Buteo jamaicensis*) (Bent 1950, Luukkonen 1987, Novak 1989, Collister 1994).

Conservation/management: Despite its widespread distribution, the loggerhead shrike is one of few North American passerines whose populations have declined across the continent in recent decades (Yosef 1996). The decline has been most dramatic in the northern parts of its range, east of the Mississippi River (Little 1987, Yosef 1996). The U. S. Fish and Wildlife Service (1987) has identified the loggerhead shrike as a migratory nongame bird of management concern. The species also was listed as a candidate (Category 2) under review for possible federal listing but was delisted in 1996. However, it remains a species of management concern. The loggerhead shrike is listed as endangered in Michigan, and endangered or threatened throughout the Great Lakes and northeastern states and Canada (Little 1987).

Reasons for the widespread decline of this species are still unclear. Habitat loss due to changes in land use practices and pesticide contamination appear to be possible leading factors contributing to this species' decline (Anderson and Duzan 1978, Kridelbaugh 1983, Yosef 1996). Loss of open grasslands, prairies, pastures and farmland due to vegetation succession and conversion to other land uses (e.g., urban development) has contributed to habitat loss for this species (Yosef 1996). Also, changes in farming practices from generally



small farm fields with brushy vegetation and trees along fencerows, which provided nesting sites and hunting perches, to larger, more intensive farms with fewer fencerows and fewer scattered trees (Hands et al. 1989). Roadside management practices (e.g., spraying with herbicides, shrub removal) also have resulted in habitat loss and mortality (Yosef 1996). However, loggerhead shrikes have declined more sharply than their habitat (Little 1991), and in areas that apparently still contain suitable habitat, such as in Michigan (Evers 1994). This may be due to their habitat requirements being more specific than previously thought, or loss or decline of specific habitat components, such as reduction in abundance of available prey in spring and/or winter, removal of hedgerows and loss of wintering habitat (Evers 1994).

The role of pesticides in the decline of this species also remains unclear since results from previous studies have not been conclusive, and concentrations required to significantly impact populations are still unknown (Yosef 1996). Loggerhead shrikes also may be vulnerable to the impacts of pesticides given the predatory nature of this bird and its close association with agricultural areas (Hands et al. 1989, Evers 1994). The decline of loggerhead shrikes coincides with the introduction and increased use of organochlorine pesticides such as DDT during the 1940's to 1970's (Yosef 1996). However, organochlorines have not been widely used since the 1970's, and yet loggerhead shrikes have continued to decline (Bartgis and Soule 1992). DDE, a chemical produced after DDT is metabolized, has been detected in loggerhead shrike adults and eggs (Anderson and Duzan 1978, Novak 1989). Although some eggshell thinning has been observed, it has not been significant or consistent among studies, and reproductive success remains high (Anderson and Duzan 1978, Luukkonen 1987, Hands et al. 1989, Gawlik and Bildstein 1990, Kridelbaugh 1982). Data from Canada indicate that clutch and brood sizes also declined after the introduction of organochlorines (Cadman 1985). However, this decline is likely due to reduction in food supply rather than direct chemical effects (Yosef 1996). For example, dramatic declines of the loggerhead shrike in prairies correspond with dieldrin treatment of grasshoppers, which comprise a significant portion of the shrike's diet (Yosef 1996). Loggerhead shrikes also may be exposed to pesticide contamination in wintering areas (Anderson and Duzan 1978).

Other causes of mortality and factors that may contribute to the decline of this species include potential for significant mortality during migration, competition with species that are more tolerant of human-induced changes (e.g., American kestrel (*Falco sparverius*) and European starling (*Sturnus vulgaris*)), human persecution, and collisions with automobiles (Luukkonen 1987, Novak 1989, Evers 1994, Yosef 1996). In Virginia, collisions with vehicular traffic accounted for 29% of observed fall and winter mortality, second only to predation (Blumton 1989). Increase in roads and vehicular traffic since the 1940's could be a major factor in population declines (Yosef 1996).

The most critical need for conservation of loggerhead shrikes is to determine the causes of its decline (Little 1991). In the interim, current populations and nest sites should be protected and monitored. Suitable nesting and wintering habitat in areas with regular loggerhead shrike activity should be maintained (Bartgis and Soule 1992). In Michigan, suitable habitat in areas with confirmed nest sites in the last 10 years (Allegan, Alpena, Benzie, Grand Traverse, Huron, Ogemaw, and Presque Isle counties) should be protected and expanded (Little 1991). Habitat management for loggerhead shrikes should focus on providing suitable nest trees and perches and maintaining short vegetation for foraging (Little 1987). Suitable habitat can be expanded by planting appropriate nest trees and shrubs (e.g., eastern red cedar, osage orange, apple and low pines and spruces) in fence rows next to existing pastures and other grassy areas. Hunting and lookout perches are generally widely available, for example, in the form of power lines (Little 1987). However, supplying perches farther from roads could reduce the likelihood for mortality resulting from bird collisions with vehicles (Little 1987, Bartgis and Soule 1992). Maintenance of short vegetation in breeding and foraging habitat, such as pastures and grassland habitat, can be achieved by grazing, mowing and/or prescribed burning (Yosef 1996). Burning should be frequent enough to help prevent succession and encroachment of woody vegetation but maintain scattered trees and shrubs (Hands et al. 1989). Crop rotation to provide fields with short vegetation also can be used as a management tool to maintain foraging habitat near appropriate nesting habitat at all times.

Since loggerhead shrikes use roadside vegetation, roadside habitats should be incorporated into



management plans (Hands et al. 1989). State departments of transportation should be encouraged to leave some shrubs along roadsides, despite the potential for mortality from collisions with vehicles (Hands et al. 1989). In light of potential impacts from pesticides, their use should be restricted and monitored in areas with shrike activity to minimize impacts on prey populations (Hands et al. 1989, Little 1991). In local situations where predation is identified as a significant limiting factor, predator management may be necessary once predators are identified (Hands et al. 1989).

Research needs: Determining the causes for population declines of loggerhead shrikes remains the top research priority for this species (Little 1991, Yosef 1996). Population parameters and habitat use should be compared between declining and stable populations in an attempt to identify potential causes for decline (Yosef 1996). Annual monitoring of known nest sites and surveys to identify additional breeding pairs should continue. In regions where shrike populations are small, tracking nesting locations and nesting attempts would be worthwhile to identify site-specific problems and help determine causes for decline (Yosef 1996). Additional studies on the effects of pesticides and other chemicals, such as endrin (applied in orchards) on loggerhead shrikes, particularly shrike reproduction, should be conducted (Evers 1994, Yosef 1996). More research is needed on this species' wintering habitat needs and ecology (e.g., foraging success, impacts of intra- and interspecific competition) to investigate threats and potential causes for decline. Studies to investigate the possibility of inducing multiple clutches, artificially incubating eggs and hand-rearing young birds to produce large numbers of birds for research, release and reintroduction should be initiated (Cade 1992). Migration and fledging mortality needs to be further elucidated. Responses to management activities should be monitored and evaluated to help develop effective and successful management programs for this species.

Related Abstracts: prairie drop-seed, rough fescue, eastern prairie fringed orchid, Henslow's sparrow, northern harrier

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