# STATEWIDE SURVEY AND HABITAT PROTECTION FOR THE LOGGERHEAD SHRIKE IN MINNESOTA

**FINAL REPORT**

submitted to

**U.S.F.W.S PARTNERSHIPS FOR WILDLIFE PROGRAM**

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## INTRODUCTION

The Loggerhead Shrike *(Lanius ludovicianus)* historically bred throughout the United States, southern Canada, and northern Mexico. Declines in Loggerhead Shrike populations have been recorded in all areas of the bird's breeding range (Peterjohn and Sauer 1994, Yosef 1994). The most severe declines have occurred in New England, where the species has been virtually extirpated. Significant declines have also occurred in the Midwest.

Once considered a common inhabitant of the agricultural region of the Minnesota (Roberts 1937), Loggerhead Shrike populations have now declined so severely that the species has been designated as threatened under the state endangered species statute (Coffin and Pfannmuller 1988). The last intensive statewide survey for the Loggerhead Shrike in Minnesota was conducted in 1986 and 1987, when University of Wisconsin graduate student Bonnie Brooks located 29 and 19 pairs in these years in 12 counties. In 1989, the MNDNR initiated a statewide monitoring program based on the results of Brooks' project. The monitoring methodology involved point surveys conducted at 1/2 mile intervals along 8 routes located in areas of historical breeding concentrations. This monitoring program documented a dramatic decline of this species along the survey routes between 1989 and 1994. This apparent decline was difficult to interpret for several reasons. Vegetation changes and conversion to other land uses had resulted in changes in habitat suitability along the survey routes. In addition, casual observations of shrikes in the vicinity of the survey routes suggested that more birds were present than were being detected by the methodology. Concerns about the validity of the monitoring methodology lead to the initiation of the current project.

The primary purpose of the 1995-96 project was to determine the current distribution and abundance of the Loggerhead Shrike in Minnesota to provide a basis for monitoring, further research, and the development of a recovery/management plan for the species. At the same time, the project provides comparisons of the efficiency and effectiveness of various methods of locating shrikes. In addition, because the largest known concentration of active shrike territories occurs in Dakota Co., a portion of the Twin Cities metropolitan area where rapid development is occurring, there is also a critical need for immediate habitat conservation measures to preserve shrike habitat. Therefore, a third objective of the current project was to offer technical assistance to landowners to maintain and enhance existing pasture land known to harbor Loggerhead Shrike territories.

## METHODS

### 1995 field work

In 1995 MNDNR contracted with Matt Etter, a graduate student at the University of Minnesota to develop and implement methodology to accomplish three objectives: 1) to estimate the distribution and size of the population of Loggerhead Shrikes in Minnesota in 1995, 2) to compare the data from 1995 with previous years in order to infer trends in the breeding population of the species in Minnesota, and 3) to compare survey methods to help determine the most efficient methods for future monitoring of the Loggerhead Shrike population.

Three search methods were used during the 1995 survey. The first will be referred to as Territory Watches. This search method was used to establish a basis for estimating the population of breeding shrikes, against which other methods were compared. A full description is given in Appendix A: Search Methods. To summarize, surveyors were asked to visit all Loggerhead Shrike breeding territories three times during the breeding season. These visits were planned to correspond to the expected shrike activities of pair-formation and nest-building, incubation, and brood rearing and fledging. Each visit was to last a maximum of two hours. All territories in the state on which Loggerhead Shrikes were known to have nested at least once between 1986 and 1994 were visited (Figure 1). In addition, locations were added to the search effort if a report of a Loggerhead Shrike was received by the DNR. Two useful sources of Loggerhead Shrike sightings were MNBird, the Minnesota on-line birding network; and MOU, the Minnesota Ornithologists Union. A third source of leads was reports of Loggerhead Shrikes from landowners.

The second search method was Road Transects. This was essentially the same as the search method employed by the DNR for monitoring shrike populations in the state. Road Transects were conducted in Clay, Dakota, and Le Sueur counties. Transects were placed in areas where Territory Watches were also done to allow comparison of detection rates by the two methods. A full description is given in Appendix A. Surveyors were asked to drive pre-established routes; stopping every half-mile to scan the surrounding area for shrikes. Participants scanned for five minutes before moving on to the next stop. Each route was driven three times, usually by different volunteers. The participants in this survey were volunteers recruited from MNBird, the Minnesota On-line Birding Network, and from the University of Minnesota. Participants were not aware of locations of known shrike territories along transect routes.
The third search method was the Big Day Search. This method was used only in Lac Qui Parle County. Using this method, seven participants in four vehicles intensively searched sections of the county looking for shrikes. Guidelines are included in Appendix A. The search was done in an area where Territory Watches were also done. The emphasis of the search was to cover as much area as possible in a single day of observation to determine how the results of this type of exhaustive searching would compare to results of the Territory Watch method.

All nests located were revisited after the end of the nesting cycle to record data on nest height and nest tree species.

**1996 field work**

In 1996, modifications were made to the protocol and data sheet based on recommendations developed after the 1995 field season (Appendix B). Only the Territory Watch method was used. ***Staffing limitations*** required that priorities be established for revisiting known territories. Priorities were as follows: 1) territories known to be active in 1995, 2) newly reported sightings that appeared to merit further attention, and 3) sites known to have had territories prior to 1995, where no birds were found in 1995, but that were judged to contain suitable habitat in 1995. Measurements at nests were not taken.

## RESULTS

### 1995 Field Season

Throughout the results and discussion section the term *`original observations'* is used to refer to a first observation of a shrike on territory using a particular search method. Subsequent observations of shrikes at the same location are less important for determining the efficiency of the methods. Therefore, analyses of the search method efficiency focused only on first observations of single shrikes or pairs of shrikes on a territory. No active shrike territories were discovered for the first time by any method other than Territory Watches.

Territory Watches A total of 122 potential shrike locations in 30 counties was surveyed (Table 1). Nineteen "confirmed nestings" in 12 counties were discovered (Table 2). Confirmed nestings were those based on observations of active nests, or adults with dependent young. An additional 5 cases have been classified as "probable" nesting because more than one shrike was observed at one location on more than one occasion; in 3 of these cases empty nests that resembled shrike nests were found in the vicinity. Therefore, the total number of nesting attempts observed was' 24 in 13 counties. Since shrikes will often re-nest in a single season, and since birds were not banded, it is possible that some of the 24 nesting attempts were re-nestings. However, evaluation of the proximity and date of sightings suggests that this was a possibility in only 2 cases.

In 5 additional cases, one or more shrikes were seen at least twice at the same location, suggesting that they were on territories, but there was no evidence of nesting, and the birds could not be relocated by the third visit. These were included as "original observations" for the purpose of evaluating the methodologies. Of the 29 first observations of shrikes on territories, 21 were seen on the first visit to that territory, 3 were seen on the second visit and 4 were seen for the first time on the third visit to the territory (Figure 2). A few territories were visited more than three times because observers were in the area for other reasons. In only one case was a shrike first observed on a territory after the third visit. In total, about 420 hours were spent looking for shrikes by the Territory Watch method, with an average of 14.5 hours spent per original . observation (Table 3).

Road Transects Eight occupied shrike territories were known (from Territory Watches) to be within one quarter-mile of a road transect. Using the Road Transect method, 9 observations of shrikes were made on 4 of these territories. Subsequent follow-up failed to relocate any shrikes at the point of sighting on the route. No new territories were found using this methodology. In total, more than 45 hours were spent on the transects and 11 observations of shrikes were made. Five of these observations were original observations. This is an average of 9 hours per original shrike observation (Table 3).

Big Day Search On July 9 a Big Day Search was carried out in Lac Qui Parle County. Shrikes were observed at two locations. Both of these were already known to John Schladweiler and .

Paul Bremer who were responsible for searching that county. A total of 67.5 person-hours were spent during this search, an average of 33.75 hours per original shrike observation (Table 3).

Nest Site Measurements Sites where nests were found were all revisited after the end of the nesting cycle to record data on nest-height and nest tree species. Average nest height was 1.97 m (maximum 4.35 m, minimum 0.53 m). Most nests were in red cedar, but 7 other woody species were also represented at least once (Table 2).

**1996 Field Season**

In 1996, 65 locations in 26 counties were searched using the Territory Watch method outlined in Appendix B (Table 1). Twelve confirmed nestings were observed in 8 counties; one additional probable nesting was observed, resulting in a total of 13 nesting attempts (Table 4). Only a small proportion of the nestings were in close proximity to 1995 nestings.

**Landowner Technical Assistance**

Information about Loggerhead Shrikes was initially disseminated in the form of posters showing a picture of a shrike, and requesting that sightings be reported to MNDNR. Approximately 200 posters were widely distributed throughout known shrike habitat areas in the state. In addition, in Dakota Co., information was provided to the Dakota Co. Extension Service for incorporation into their newsletter, which is distributed to over 20,000 households in the county. In both 1995 and 1996, when landowners in Dakota County were contacted for permission to survey their property for Loggerhead Shrikes, as well as during the course of field work, field staff discussed the history of use of their property by shrikes and provided them with information about the natural history of the species, including habitat requirements, and appropriate management activities. To facilitate this effort, in fall, 1996, a fact sheet for landowners was developed incorporating information about species identification, life history, and practical suggestions for actions the landowner could take to maintain or enhance shrike habitat (Appendix C). The fact sheet will be utilized in 1997 and succeeding years to increase the likelihood that landowners will maintain shrike habitat on their property.

## DISCUSSION

**Comparison of Methods**

The average number of person-hours per original shrike observation was less with the Road Transect than the Territory Watch method. However, in only 50% of the cases when a known shrike territory was within 1/4 mile of the transect were shrikes detected using the road transect method (Table 3). This indicates that the transect method as employed between 1989 and 1995 does not provide an accurate assessment of population numbers. The territory watch method, although it resulted in the detection of twice as many shrikes as the Road Transects in the

1995 comparison, is not a cost-effective monitoring technique, because it requires an excessive investment of time (more than 14 person-hours/original observation). The Big Day search method yielded the same number of shrike observations as did the Territory Watch for the same area, but with a still greater investment of time. It might be a useful tool for generating public interest, and searching a fairly large area in a short amount of time. Because of the limited application of the Big Day methodology, further evaluation is not possible.

**Distribution and Abundance**

Comparison of existing data for numbers of Loggerhead Shrikes in Minnesota is problematic because of variations in search effort and methodology. Brooks (1988) found 29 pairs in 12 counties in 1986 and 19 pairs in the same search area in 1987. In those same counties in 1995 we found 18 nest attempts and 10 nest attempts in 1996. An additional 6 nest attempts were found in 1995 and 3 in 1996 in counties in which the 1986 survey team did not search. In only one county, Dakota, were more nest attempts documented in 1995-96 , with 9 attempts documented in 1995 and 4 in 1996, compared to 2 nest attempts in 1986 .

Regarding the apparent decline in numbers between 1995 and 1996, one way of evaluating its validity is to compare results in the southwestern part of the state where the same observer conducted all the searches in both years. There were 6 confirmed nestings in 1995 compared to 5 in 1996. In 1995, most nestings were in the western part of the region, whereas in 1996 they were concentrated in the eastern part of the region. In only one case was an active territory from 1995 confirmed to be active in 1996. These data, although limited, suggest no striking difference in population levels in that part of the state. Confounding factors between the two years include the lateness of the spring in 1996, and relatively deep snow that was unusually slow to melt in the western part of the state. Cold, dry conditions in the wintering range also occurred in the winter of 1995-96.

Habitat notes made by surveyors indicate that in a number of cases, land use changes have occurred since 1987 that decrease the apparent suitability of some sites for shrikes. In some cases, pasture land has been converted to row crops. In others, pasture that was formerly lightly grazed is now either heavily grazed, or not grazed at all. Finally, some areas that appear to have suitable grassland cover, have few or no hunting perches and/or nesting trees. The absence of shrikes in these cases could be explained by these changes in habitat suitability. However, in many other cases, sites that are now vacant that were once used by shrikes still appear to have an abundance of suitable habitat. It is less clear why shrikes are no longer found on these sites.

An additional, unexpected complication in interpreting results of surveys was the difficulty in confirming nesting when shrikes were observed. For example, in 1995, 6 observations of shrikes were made that could not be relocated on subsequent visits. In 1996 in Dakota Co. this occurred in two instances. Rolling topography, interspersed private and public land ownership, and apparently high rates of predation all contributed to this problem. These observations raise questions about whether between year differences in numbers of confirmed nestings reflect real differences in population levels, or difficulties in consistently detecting birds.

Short-term clustering of breeding pairs of Loggerhead Shrikes was observed, with locations shifting among years. In 1986, Sherburne County had 9 nesting attempts by 8 pairs of shrikes. In 1995, the same county had only one nest attempt. In 1986, in Dakota County only 2 nest attempts were discovered, whereas in 1995 there were 9 nest attempts. These clusters accounted for a large proportion (33% in 1995, 24% in 1986) of the total known breeding population in the state. The significance of these observations is unknown, but they appear to reflect periods of high recruitment and/or survival followed by local declines. The remainder of the population occurs as scattered pairs across many counties.

**Future Research**

Although the results of the current study have provided some important insights, further research will be required to determine whether a costeffective method can be developed for monitoring Loggerhead Shrikes in Minnesota. Population numbers are so low and most of the birds so widely dispersed that none of the methods tested in this study are practical tools for tracking population changes. Strategies that would increase the probability of detecting shrikes when they are present are needed. The concentration of shrikes in Dakota Co. presents an opportunity to explore different approaches utilizing color-marking of individuals.

**Future Landowner Assistance**

The fact sheet for landowners (Appendix C) will be distributed to landowners with current or historical shrike territories on their property. Habitat notes recorded by field surveyors will provide a basis for providing more extensive advice to landowners who are interested in maintaining or enhancing shrike habitat on their property. Particularly in the western and southwestern parts of the state there are opportunities to work with public land managers where once-grazed pastures have become rank grasslands. Periodic mowing or judicious burning are possible management strategies for restoring grasslands to conditions more suitable for shrikes. In some cases, planting trees or placing fence posts with barbed wire looped on the top may be recommended.

## REFERENCES CITED

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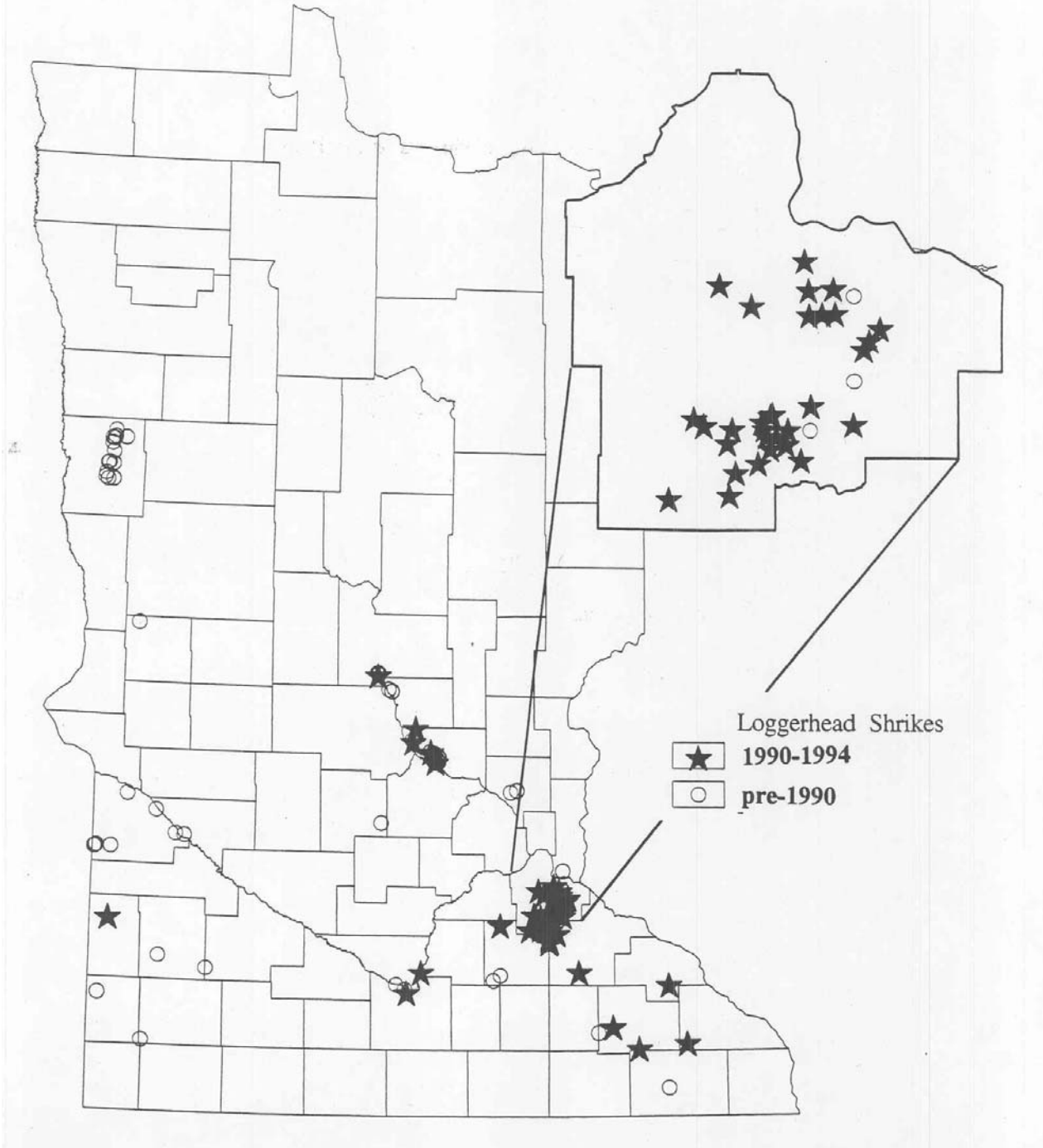
Participants in 1996 field work (in alphabetical order): P. Bremer, S. Kittelson, B. Lenning, B. Longley, J. Shulz, and K. Woizeschke

**Figure 1. Loggerhead shrike locations from Natural Heritage Information System as of December, 1994.**



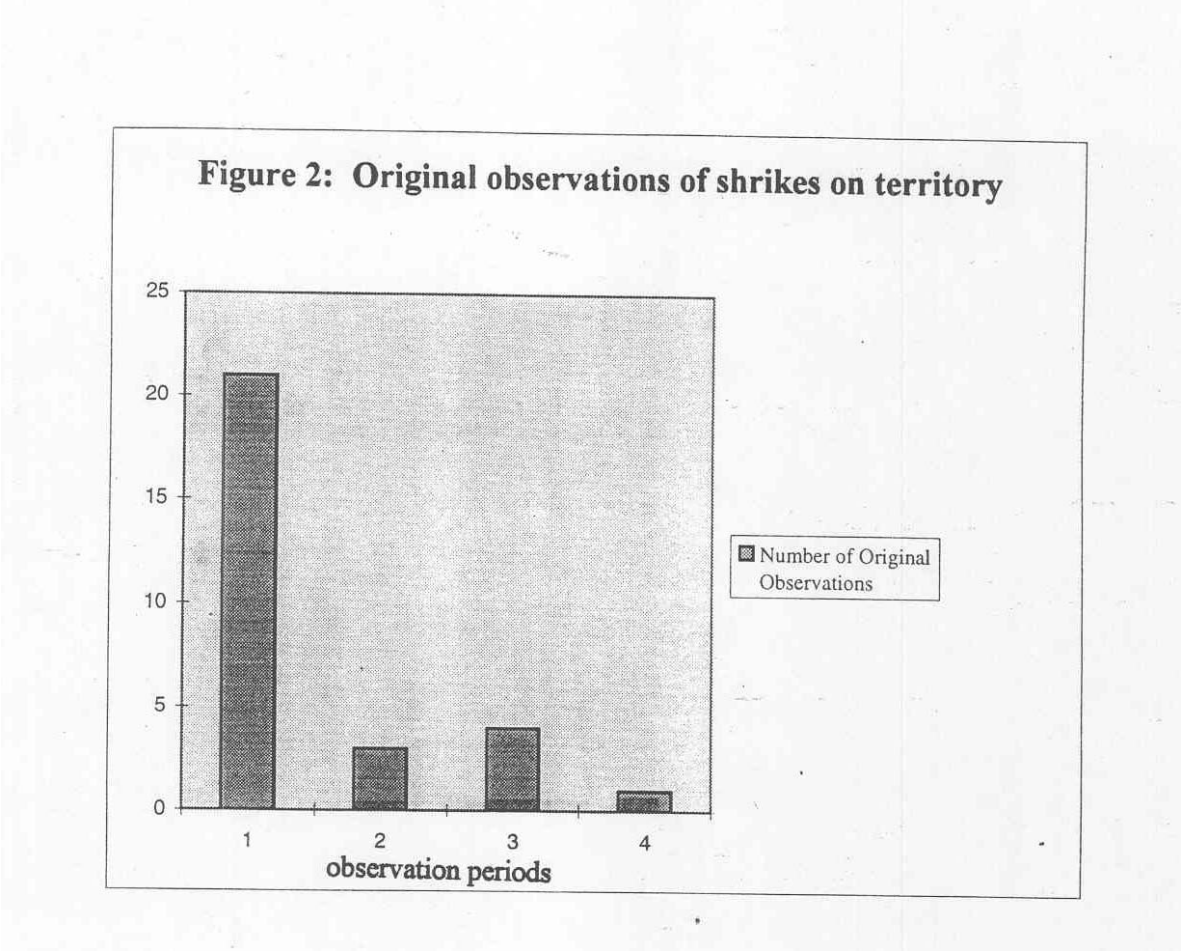


Figure 2: Original observations of shrikes on territory
25
20
15
10
5
0
1
2
3
4
observation periods
Number of Original Observations

**Table 1. Number of locations surveyed by county and year**

| DNR REGION | COUNTY | # of locations searched | |
|---|---|---|---|
| | | 1995 (N=122) | 1996 (N=65) |
| 1 | Clay | 20 | 6 |
| 3 | Benton | 3 | |
| 3 | Morrison | 3 | |
| 3 | Sherburne | 15 | 1 |
| 3 | Wright | | 1 |
| 4 | Big Stone | 1 | 2 |
| 4 | Blue Earth | 2 | 3 |
| 4 | Chippewa | | 1 |
| 4 | Douglas | 1 | |
| 4 | Jackson | 1 | 1 |
| 4 | Kandiyohi | 1 | 1 |
| 4 | Lac Qui Parle | 8 | 10 |
| 4 | LeSueur | 2 | 2 |
| 4 | Lincoln | 1 | 2 |
| 4 | Lyon | 1 | 1 |
| 4 | Meeker | 1 | 1 |
| 4 | Murray | 1 | 1 |
| 4 | Pipestone | 1 | 2 |
| 4 | Redwood | 1 | 1 |
| 4 | Swift | 1 | 1 |
| 4 | Yellow Medicine | 1 | 1 |
| 5 | Dodge | 1 | 1 |
| 5 | Fillmore | 3 | 2 |
| 5 | Goodhue | 13 | 1 |
| 5 | Houston | 1 | |
| 5 | Olmsted | 2 | 1 |
| 5 | Rice | 4 | |
| 5 | Wabasha | 2 | |
| 5 | Winona | 1 | |
| 6 | Dakota | 26 | 20 |
| 6 | Scott | 3 | 1 |
| 6 | Washington | 1 | 1 |

**Table 2: Loggerhead Shrike Confirmed and Probable Nestings Found During 1995 Survey**

| | Twshp | Range | Section | Date of Nest Discovery | Nest Tree Species |
|---|---|---|---|---|---|
| Big Stone* | 121 | 45 | wsw26 | PROBABLE | russian olive |
| Clay | 139 | 46 | swne14 | PROBABLE | |
| Clay | 140 | 46 | nwnw02 | 15-May | willow |
| Clay | 140 | 46 | nwse23 | 15-May | willow |
| Clay * | 141 | 45 | nenw08 | PROBABLE | amer. plum |
| Dakota * | 112 | 19 | nwnw04 | PROBABLE | amer. plum |
| Dakota | 112 | 19 | swne02 | Ad. + Yg. | |
| Dakota | 113 | 19 | sene25 | PROBABLE | |
| Dakota | 113 | 18 | nwnw16 | 11-May | red cedar |
| Dakota | 113 | 18 | nenw22 | Ad. + Yg. | |
| Dakota | 113 | 20 | nese24 | 11-May | red cedar |
| Dakota | 114 | 18 | nene16 | 2-Jun | red cedar |
| Dakota* | 115 | 18 | sese34 | Ad. + Yg. | red cedar |
| Dodge | 106 | 16 | nesw35 | 13-Jun | red cedar |
| Fillmore | 102 | 12 | senw07 | 10-Jul | red cedar |
| Goodhue | 111 | 18 | nene06 | 17-May | amer. plum |
| Lac Qui Parle | 116 | 46 | nwnw05 | 22-Jun | Chinese elm |
| Le Sueur | 109 | 26 | nwnw05 | 19-May | red cedar |
| Le Sueur | 109 | 26 | ssw05 | 5-May | red cedar |
| Lincoln | 112 | 46 | nene12 | 14-Jun | hawthorne |
| Meeker | 118 | 29 | sese02 | 20-Jun | Blue spruce |
| Scott* | 114 | 24 | sese14 | Ad. + Yg. | red cedar |
| Sherburne | 33 | 29 | nene02 | 29-May | grape vine |
| Washington | 27 | 21 | 21,28,27 | Ad. + Yg. | |

* The nests at these territories were discovered after they were no longer being used. Their strong resemblance to shrike nests, their condition and their central position to repeated 1995 shrike observations suggested allow that they may have been active loggerhead shrike nests during the 1995 breeding season. Where adults with young (Ad. + Yg.) were seen, the observation was considered a confirmed nesting. Where no young were observed, the observation was considered a probable nesting.

Table 3. Comparison of search methods

| Survey Method | Total Number of Hours | Number of Original Shrike Observations | Average Number of Hours per Original Observation | Ratio of Known Shrikes Observed |
|---|---|---|---|---|
| Territory Watches | 12:00 | 29 | 14:28 | NA |
| Road Transects | 21:16 | 5 | 09:03 | 5/10 |
| Big Day Search | 19:30 | 2 | 09:45 | 2/2 |

**Table 4: Loggerhead Shrike Confirmed and Probable Nestings Found During 1996 Survey**

| | Twshp | Range | Section | Date of Nest Discovery | Nest Tree Species |
|---|---|---|---|---|---|
| Blue Earth | 108 | 27 | swsw08 | Ad. + Yg. | |
| Blue Earth | 108 | 28 | nenw03 | 28-May | red cedar |
| Blue Earth | 109 | 26 | swse19 | 28-May | red cedar |
| Clay | 141 | 45 | nenw08 | PROBABLE | |
| Clay | 141 | 46 | sese01 | 26-Jun | amer. plum |
| Dakota | 113 | 18 | nenw22 | May | ash |
| Dakota | 113 | 18 | ne30 | 3-May | red cedar |
| Dakota | 113 | 18 | swse30 | 3-May | red cedar |
| Dakota | 114 | 18 | nene16 | | red cedar |
| Lac Qui Parle | 119 | 43 | nese20 | 10-Jul | Russian olive |
| Le Sueur | 109 | 26 | ssw05 | 24-May | red cedar |
| Olmsted | 107 | 13 | sesw25 | 11-Jun | ash |
| Wright | 121 | 23 | swne22 | 23-May | cottonwood |
| | | | | | |

# Appendix A: page 1
# Loggerhead Shrike Breeding Census
# 1995 Field Season Protocol

**Objectives:**

1. Maximize discovery rate of active Loggerhead shrike breeding territories.
2. Verify status of all breeding territories known to be active between 1986 & 1994.
3. Obtain preliminary data on land-use and territory characteristics of nest sites.

**I. Census of Historical Territories:**

1. All territories known to be active during at least one breeding season from 1986-present should be included in the 1995 census. In most cases this can be quickly determined from the Natural History Database, however if Regional Nongame Specialists or volunteers have further information regarding possible nest-sites, these should be investigated using the same methodology. This includes any 1995 reports that seem to offer a chance of finding breeding birds.

2. Each territory should be visited at least once during the following three periods:

| | |
|---|---|
| A. Pre-hatching: | Mid-April - Mid-May |
| B. Nestling: | Mid-May - Mid June |
| C. Fledgling: | Mid-June - Mid July |

3. In most cases a territory should be considered to be the quarter section ('/a mi2) and all adjacent quarter sections. Observers may be able to quickly determine unsuitable habitat (e.g. row crops with no available perches). If suitable habitat occurs further than the adjacent quarter section, the observer may search the area at his or her discretion, however searches should not continue beyond 2 miles of the historical nest site.

4. 1-2 hours should be spent at each territory walking along edge of territory (if private property), or actually walking along suitable nesting and hunting habitats (if public). In some cases landowners should be contacted for permission to enter property if suitable habitat is observed too far from the road to determine shrike presence.

5. For each visit to each territory a new two page data sheet should be completed. Data recorded should include:

a. observer
b. territory # (from NHD if pre-existing) and Location (T/R/S/'/a/1/a)
c. date
d. time (begin/end)
e. weather (Temp/precipitation/Wind speed and direction)

6. A crude map should always be made of the territory, even if shrikes are not observed. In cases where no birds are seen the map should be detailed enough to quickly show what area was searched intensively. Any data which the observer thinks significant may be recorded. This might include habitat type, proximity of human habitation, noise levels, proximity to good hunting habitat, etc...

## Appendix A: page 2

7. In cases where birds are observed, the location should be recorded on the map at the bottom of page one of the census form. The large grid should correspond to and be identified with the "h. Location Observed" question on the data sheet. Subsequent movements of the shrike should be recorded as the observer tries to locate the nesting site. In addition, the following data should be taken:

f. # adults observed
g. # immatures observed
h. location birds observed (T/R/S/¼/¼ )
i. behavior (see checklist)

**II. Nest Searches:**

1. Whenever a shrike is observed, the observer should remain in the territory until the nest site is located or until the observer loses sight of the bird.

2. After nest is located, the following data should be recorded:

j. approximate nest height
k. distance from nearest road (Please identify road.)
1. # eggs in nest (if possible)
m. nest-tree species

3. All movements during nest searches should be recorded on the map whenever possible.

4. Significant landforms, both natural and anthropogenic should also be recorded. These data should include land-use patterns within territory whenever the observer thinks they may be significant.

5. If contact with the birds is lost, the nest search should resume during the following scheduled territory search.

# Loggerhead Shrike Census Form

a. Date:_____ b. Observer:_____c. Visit- 1'st_____
2'nd_____
d. County: _____e. Territory #: _____3'rd_____

f. **Location:** Township: _____ Range:_____Section:_____

¼:_____of ¼ Section:_____ g. Time begin/end:_____/_____

h. **Weather:** Cloud Cover: 0-25% 25-50% 50-75% 75-100%

Temp.:_____Precip.:_____Wind (speed and dir):_____

**i. Shrike observed:** Y N **j. Nest located:** Y N

k. #Adults seen:_____ l. # Immatures seen:_____ m. Location Observed:

(T/R/S/¼ of ¼): _____

**n. Behavior:**

__Flying __On ground __Bathing __Singing (not calling)
__Perched __Feeding young __Roosting __Sitting on nest
__Hunting __Other (please describe _____

_____

**o. Habitat features shrike was observed using:**

__Snag __Telephone wire __Nest tree __Tree for perching __House/shructure

**Nest Site Characteristics:**

p. Height:_____ Distance from nearest road:_____r. #eggs present:_____

s. Nest Tree Species:_____t. # Nestlings:_____ u. Fledged:_____

v. Notes: (on back) Please describe briefly any characteristics of the nest site which you may think are significant. This may include distance from water, proximity to other trees, proximity of foraging habitat, noise levels in nesting area, observed human activities in area which may affect shrike nesting. Also, please try to locate as near as possible on the map (previous page) the actual nesting site. Include any information which might be useful for another observer to locate the nest in your absence.

**Appendix A: page 4**

State of Minnesota

Loggerhead Shrike Monitoring Program - Revised 6/95

FIELD INSTRUCTIONS

1. Routes should be run three times/season, once during the last week of June, once during the second week of July, and once at the end of July.

2. Routes may be conducted anytime during the day. You will maximize your chances of encounter, however, if you conduct them before 10:30 AM or after 4:30 PM.

3. Always start the route at the same end each time it is run.

4. The stops have been designated as red dots along the enclosed yellow route.

5. The observation period at each stop is 5 minutes. Like the federal breeding survey, this time should be spent outside of your vehicle scanning (with binoculars) all portions of the area invisible from the stop. Pay particular attention to high wires, fence rows, snaps and tree tops.

6. A different copy of the route map should be used for each of the 2 runs of the route. When a shrike is sighted, an x should be placed on the map at the best estimate of the location of the bird. Also, circle the dot that corresponds with the stop that the bird was seen from.

7. Record all the shrikes seen while you're traveling between stops as well. Indicate that they were seen "enroute" in the mars-,in.

8. On the margin of the map, the following information should be recorded: Observer Name Date Weather (Temp., Wind Speed and Direction, Cloud Cover) Beginning and ending time of run.

9. For each shrike observation, the following information should also be recorded on the map margin: Time Number of Adults Number of Young An arrow can be used to tie this information to the "X" marking the location of the sighting.

10. Regarding weather condition, it is best to run the routes on clear, calm days. Light rain and low winds are acceptable. Use your best judgment.

11. Each ten miles of route should take between 2 and 4 hours to run.

Loggerhead Shrike Breeding Season Phenology

Given the expected regional variability within the state, hatching generally occurs around Memorial Day. The young remain in the nest for approximately 3 weeks. Once they have fledged, they stay together in a family group in the territory for another 3 weeks. In late July the family groups begin t spread out. As a result, survey work beyond this period could result in the double-counting of pairs and territories. In situations where a pair's nest has failed, there is still a good chance that they will stay within one mile to the original nest location.

**Appendix A: page 5**

1995 Lac Qui Parle Loggerhead Shrike Survey

9 July 1995

Primer on Shrike Natural History:

Two species of shrike exist in North America: the Loggerhead shrike *(Lanius ludovicianus)* and the Northern shrike *(L. excubitor)*. The two can be quite difficult to distinguish in the field. Fortunately in July we should only encounter the Loggerhead in Minnesota. Loggerhead diet consists mostly of insects, small birds (warbler-size), small mammals, and frogs and snakes. The bulk of their diet is probably insects. They hunt by making quick forays to the ground from perches, often snags in a field, or fenceposts. Sometimes they can be seen hunting from telephone wires. Their black and gray plumage pattern is conspicuous and can be picked out from quite a distance.

Loggerheads are found in grassland/savanna habitat. Pastures, prairie remnants, old fields, even alfalfa fields seem to provide adequate habitat for loggerheads. They will not likely be encountered in woodlands or swamps. The most common nesting-tree species in Minnesota is red cedar *(Juniperus virginiana)*. My own observation suggests that they prefer lone cedars for nesting over clumped trees. The presence/absence of hunting perches also seems to be an indicator of the quality of shrike habitat. They do not seem to need large hunting areas to survive. Some of the territories in Dakota Co. have very limited grasslands adjacent to the nest-site. My own subjective idea of the "ideal" shrike habitat is a moderately grazed pasture with a few red cedars scattered about within and barbed wire fenceline passing very close to some possible nest trees. This is definitely not, however, to say that this is the only type of place that one would find loggerheads. Habitat needs is one of the questions we will be addressing in this study to try to explain the decline in shrikes in our area.

Search Methodology:

1. Scan all areas which seem possible. Again, these birds can be picked out at quite a distance. Look especially closely at fencelines, telephone wires, tops of red-cedar, snags in fields and pasture.

2. Here are some birds which are often mistaken for shrikes: Gray Catbird, Eastern Kingbird, Blue Jay, Bobolink, and Gray Jay (not likely in Lac Qui Parle).

3. Anywhere you see a shrike (or even think you see one) please fill out a data form. Especially, important will be the exact location (legal coordinates) of the sighting.

4. Please do not ago on private property, even if it means not covering an area thoroughly. Since our survey is an officially sanctioned DNR event it is important that we avoid offending landowners.

5. In the event that you are approached by landowners and asked why you are searching their property so intently, please explain that you are volunteering for me, Matt Etter (612-645-9352), a graduate student in Conservation Biology at the University of Minnesota. If you are approached, feel free to speak to people openly about the project. It has been my experience that people are quite enthusiastic about the possibility of a rare bird being found in their area. You can distribute posters as well as my name and telephone number in case anyone wants further information. If people seem disturbed by your presence it is probably best to move on in as inoffensive a manner possible.

6. If possible, please try to drive all viable roads within your area. Keep track of which roads you have driven with a yellow highlighter so that we can retrace your route later on. Also, please try to mark in red any section which you think may contain viable shrike habitat, based on the description of habitat given above.

7. Tony Hertzel asked that we please report to him any sightings of the following birds:

| | | |
|---|---|---|
| Ferruginous Hawk | Lark Bunting | ANY Long spur |
| Burrowing Owl | Henslow's Sparrow | Loggerhead Shrike |
| Say's Phoebe | Lazuli Bunting | His email is: tony@mi112.MilIComm.com |

# Loggerhead Shrike Breeding Census
# 1996 Field Season Protocol

## Objectives:

1. Verify status of all breeding territories known to be active in 1995 by locating birds and finding, nests.
2. Record preliminary data on land-use and territory characteristics of nest sites.
3. As time allows, follow up on any newly reported sightings that appear to merit further attention.
4. As time allows, recheck sites known to have had territories prior to 1995, where no birds were found in 1995, but that were judged to contain suitable habitat in 1995.
5. As time allows, check large blocks of apparently suitable habitat in Dakota Co where sightings have not been reported.

## I. Census of Historical Territories:

1. The first priority is to recheck sites where shrikes were observed nesting in 1995. A list of these will be provided

2. Each territory should be visited at least once for approximately 1 hour during the following three periods, or until the nest is found:

| | |
|---|---|
| A. Pre-hatching: | Mid-April - Mid-May |
| B. Nestling: | Mid-May - Mid June |
| C. Fledgling: | Mid-June - Mid July |

3. The center of the search area should be the quarter section (1/4 mile radius) where the 1995 nest was located (or where shrikes were most omen observed if no nest was found). If no birds are observed in this area, the search should extend to all immediately adjacent quarter sections. Observers may be able to quickly determine unsuitable habitat (e.g. row crops with no available perches). If suitable habitat occurs further than the adjacent quarter sections, the observer may search the area at his or her discretion, however searches should not continue beyond 2 miles of the historical nest site.

4. Approximately 1 hour should be spent at each territory, walking along and through suitable nesting and foraging habitats. The initial search can often be done from roads or trails. If ownership is private, the owner must be contacted before entering the property.

5. For each visit to each territory a data sheet should be completed. Data recorded should include:
   a. DNR map code
   b. territory (EO) #
   c. date
   d. observer name and phone
   e. visit # (circle)
   f. starting location (county/T/R/S/¼ /¼ )
   g. time (begin/end)
   h. qualitative habitat assessment (see 4 questions on data sheet)

6. Notes should be made on quad map of the territory, or if more convenient on the back of the data sheet, even if shrikes are not observed. In cases where no birds are seen the notes should be detailed enough to

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quickly show what area was searched intensively. Any data which the observer thinks significant may be recorded. This might include habitat type, proximity of human habitation, noise levels, proximity to good hunting habitat, etc...

7. In cases where birds are observed, the location should be recorded the census form (T/R/S/l/4/1/4) and the topo map, (or map on back of census form). Subsequent movements of the shrike should be recorded as the observer tries to locate the nesting site. In addition, the # adults and immatures observed should be recorded on the data sheet.

**II. Nest Searches:**

1. Whenever a shrike is observed, the observer should remain in the territory and attempt to locate the nest by observing behavior of the adults.

2. After nest is located, the following data should be recorded:
   approximate nest height
   distance from nearest road (Please identify road.)
   # eggs or young in nest (if possible)
   nest-tree species

3. If contact with the birds is lost, the nest search should resume during the following scheduled territory search.

**DNR map code**_____ **EO#**_____

## 1996 Loggerhead Shrike Data Sheet

Date:_____ Observer:_____ Obs. Telephone:(_____)_____

Visit- 1st 2nd 3rd

**Starting Location:** County: _____ Township: _____ Range:_____Section:_____

¼:_____of ¼ Section:_____ g. Time begin/end:_____/_____

Please answer the following 4 questions concerning the target territory. Answer for each visit and use your judgement and experience to make the decision. Additional comments can be made on back.

Does the target territory contain suitable grassland for hunting habitat for shrikes? Y N

Does the target territory contain suitable perch sites for hunting habitat for shrikes? Y N

Does the target territory contain suitable nest trees for shrikes? Y N

Do you see any evidence of a recent change in land-use patterns on the target territory? Y N
If Yes, please describe:

**Shrike observed:** Y N **Nest located**: Y N

#Adults seen:_____ # Immatures seen:_____ **Location observed (note, this is extremely important if observation was at any distance from the target territory). Also mark locations on topo map.**

(T/R/S/¼ of ¼): _____

**Nest Site Characteristics:**

Location (T/R/S/¼ of ¼): _____
**Also mark location on topo map.**
Height:_____ Distance from nearest road:_____ #eggs present:_____

Nest Tree Species:_____ # Nestlings:_____ Fledged:_____

Notes: Please describe briefly (on back) any characteristics of the nest site which you may think are significant. This may include distance from water, proximity to other trees, proximity of foraging habitat, noise levels in nesting area, observed human activities in area which may affect shrike nesting. Also, please try to locate as near as possible on the topo map, or map on back, the actual nesting site. Add any additional features to the map or any information that might be useful for another observer to locate the nest in your absence.
**LABEL ALL SECTION CORNERS AND SECTION NUMBERS.**

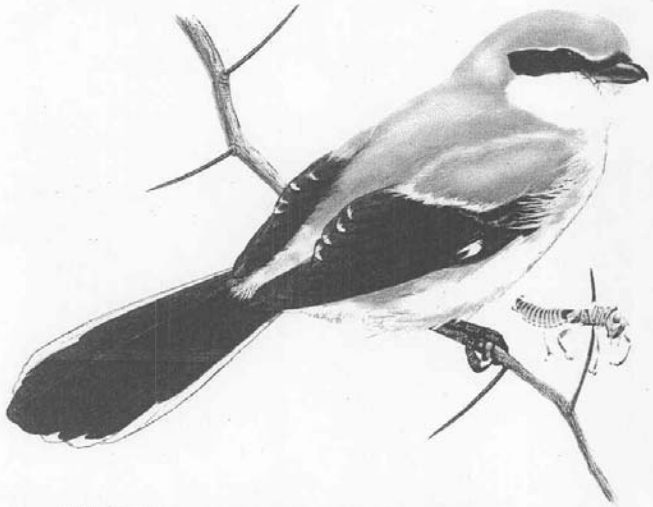
THE GRID MAP ABOVE MAY BE USED TO SKETCH IN MORE PRECISE INFORMATION ABOUT LANDMARKS IN THE VICINITY OF SIGHTINGS OR NESTS. **IF YOU USE THIS** MAP, **YOU MUST LABEL THE SECTION CORNERS. OTHERWISE IT WILL BE UNUSABLE.**

## Appendix C. Fact sheet for landowners

## Landowners Guide for Maintaining and Encouraging

# Loggerhead Shrikes

Loggerhead shrikes are in trouble – ***but you may be able to help***. Throughout the United States, and particularly in the Midwest, loggerhead shrikes are disappearing at an alarming rate. So serious is the decline that the loggerhead shrike is one of six bird species considered threatened in Minnesota.

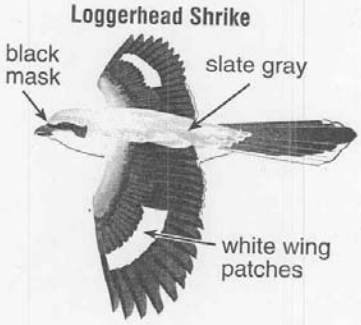


### What is a loggerhead shrike?

Loggerhead shrikes are special birds – an interesting cross between songbird and hawk. They feed on large insects such as grasshoppers and beetles, mice, small birds, frogs and toads. Shrikes spend much of their time perched on powerlines, fences or the top-most branches of trees and shrubs, scouting for prey and then swooping down to catch it. Then the bird either eats its prey, impales it on a nearby thorn or barbed wire fence or wedges it into the fork of a branch. Because shrikes lack the strong, sharp claws and feet of hawks, impaling food holds it in place as the bird tears at it with its bill. Your first clue that loggerhead shrikes are on your property may be finding an animal impaled on a fence barb or a thorn. This habit has earned the loggerhead shrike the nickname "butcher bird."

### What do loggerhead shrikes look like?

The robin-sized loggerhead shrike has a slate-gray back with a light breast. The most distinguishing markings of this bird are the black mask, which extends across the eye, and the black and white wing and tail patches which flash when the bird flies. Males and females are similar in size and color.




In Minnesota, loggerhead shrikes are most easily confused with eastern kingbirds and northern shrikes. However, eastern kingbirds have no mask, their heads are entirely dark, and they do not have white patches on their wings. The northern shrike looks very similar to the loggerhead shrike, but occurs in Minnesota from October through April, whereas the loggerhead shrike is here from March to October. During the early spring and fall, when both shrikes are in the state, they can be told apart by the loggerhead shrike's completely black bill and its mask which extends across the top of the bill.


### Where do they live?

Loggerhead shrikes were once found throughout much of the unforested region of the state. Today, their numbers are very low. Recent surveys have located fewer than 30 nests in the state (Fig. 1). It is very important that we try to maintain habitat for the few shrikes that still breed in Minnesota.

Shrikes use grassy, open areas with scattered trees and shrubs such as pastures, prairie patches and grassy roadsides. A few trees and shrubs, along with fences and powerlines provide nesting sites and perches from

*continued on back*

which to hunt. Red cedar, hawthorn and plum trees are often used for nesting. A pair may range over 2.5 - 3.0 acres.

Loggerhead shrikes are early nesters, arriving in Minnesota from their wintering areas in the southern U.S. and Mexico in early spring. Shrikes lay 4-6 eggs that hatch after about 16 days. The young birds remain with their parents for about 4 weeks after leaving the nest. It is at this time that the birds are most conspicuous. Shrikes tend to nest in the same general areas from year to year, although they may be absent for a year or two and then return again, as long as the habitat remains.

*Figure 1. Historical range of loggerhead shrikes (shaded) in Minnesota. (from Coffin and Pfannmuller. 1988.* Minnesota's Endangered Flora and Fauna). *Dots are nests found between 1990 and 1996.*

## Why is the loggerhead shrike population declining?

The decline of the loggerhead shrike is likely the result a combination of factors, including loss of habitat resulting from the conversion of pasture and grasslands to houses or cropland and the encroachment of forest and brush on pastures and grasslands. In addition, changes in farming practices have resulted in larger fields and fewer trees, shrubs and fences scattered about. The increasing use of pesticides may also play a role in the decline of shrikes because these chemicals affect many animals that shrikes eat.

## WHAT CAN YOU DO TO HELP LOGGERHEAD SHRIKES?

**If there are shrikes nesting on your property, congratulations!** You are one of a very few Minnesotans fortunate to share your property with such a unique bird. We hope you will want to help this bird continue its presence in your neighborhood. Obviously your land management practices and land use are already compatible if the birds have selected your land for nesting. While biologists continue to investigate the decline of the shrike there are things you can do on your property to encourage shrikes.

**1. Leave fences standing for shrikes to use for perching and impaling food.** If a fence must be removed, or if there are no fences near your grassland or pasture, you can create perch and impaling posts. To do this, wrap barbed wire near the top of a post. Place these posts along the edges of pastures and fields for shrikes to use. Your local nongame wildlife biologist can help you select the best locations for the posts.

**2. Keep brush from encroaching upon grasslands** by removal or burning, but only to the extent that the shrubs and trees don't dominate the grassland. A few scattered shrubs and trees are necessary to maintain the best shrike habitat.

**3. Maintain existing pastures and grasslands.** Pastures and grasslands are more attractive to shrikes than are row crops. Investigate the Conservation Reserve Program (CRP) which pays farmers to retire highly erodible farmlands from production and to establish permanent grassland. Contact your local Natural Resources Conservation Service office (formerly the Soil Conservation Service) for more information about this program.

**4. Take advantage of financial incentives for maintaining compatible land uses.** In many counties, the Agricultural Preserve Program and/or the Green Acres Program provide tax adjustments and/or deferments to farmers to help them maintain their land for agricultural use. Contact your county assessor's office for more information about these programs.

**5. Minimize use of pesticides.** Pesticides can reduce the supply of large insects and other animals that shrikes need. Also, because shrikes feed on animals at which pesticides are directed, these chemicals can build up in the birds and impair their ability to reproduce and reduce the survival of their young.

For more information about shrikes or to report loggerhead shrikes on your property please contact:

Nongame Wildlife Program
500 Lafayette Rd.
St. Paul, MN 55155
(612) 297-3764
1-800 766-6000

or locally contact:

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