1995 Minnesota Loggerhead Shrike Survey

Minnesota Department of Natural Resources

Nongame Wildlife Program

by

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INTRODUCTION

The Loggerhead Shrike *(Lanius ludovicianus)* historically bred throughout the United States, southern Canada, and northern Mexico. Declines in Loggerhead populations have been recorded in all areas of the birds breeding range (Peterjohn and Sauer 1994, Yosef 1994). The most severe declines have occurred in the Midwest and in New England, where the species has been virtually extirpated. In Minnesota, it is considered a threatened species (Coffin, B. and Pfanmuller, L. 1988). It breeds in southern and western Minnesota between April and September but is not present during the winter. Anecdotal evidence suggests that densities of Loggerhead Shrikes were considerably higher early in the century. (Table 1, Roberts 1937).

Several hypotheses have been proposed for the decline of Loggerhead Shrikes. For this report I will simply list them and elaborate only on those hypotheses which I will later relate to results of this study. Those presented here are adapted from recent papers by Yosef (1994) and by Yosef and Lohrer (1995).

1. Low reproductive success (but see Brooks 1988)
2. Loss of breeding habitat, including removal of fencelines which serve as observation perches and nest sites.
3. Reduced survival on winter range
4. Pesticide ingestion

5. Inclement weather during nesting cycle

6. Disease

7. Interspecific competition

8. Collisions with cars.

The most comprehensive study of Loggerhead Shrikes in Minnesota was done by Bonnie Brooks for her Master's project "The breeding distribution, population dynamics, and habitat availability and suitability of an upper midwest Loggerhead Shrike population." between 1986-1987. She studied three fundamental aspects of the biology of Loggerhead Shrikes in Minnesota. First, she carried out a survey of breeding shrikes in 12 counties. In 1986 she found 32 nests and classified an additional 5 cases as likely nesting, though the nest was never found. In 1987 she found 27 nests. In both years nests were monitored and clutch size, hatching success and fledging success were recorded. Her results showed high overall fledging and hatching success (72% and 76% respectively) (Brooks 1988).

The second aspect of Bonnie Brooks' study was to build a population projection model parameterized by the results of nest monitoring from 1986 and 1987 and using male return rate (47%) as an estimator of adult survival. The results of this model suggested that the Minnesota population was not stable, and predicted a 20% annual decline in population size (Brooks 1988).

Finally, Ms. Brooks used quantitative methods to measure habitat availability for Loggerhead Shrikes in Minnesota. Her results showed that, while shrike habitat may be limited, there is more habitat available in Minnesota than there are breeding Loggerhead Shrikes to occupy it (Brooks 1988). For a more complete discussion of these results, please refer to the original documents.

Ms. Brooks' study was expanded into an annual monitoring program for the MN DNR. Her methods were reproduced in subsequent years to monitor the breeding population of Loggerheads in Minnesota. That monitoring program has continued, with some modifications of methods, until the present.

1995 SURVEY

The 1995 survey had three objectives. The first objective was to estimate the distribution and size of the population of Loggerhead Shrikes in Minnesota in 1995. The second was to compare the data from 1995 with previous years in order to infer trends in the breeding population of loggerheads in Minnesota. The third objective was to test and, where possible, compare survey methods to help determine the most efficient methods for future monitoring of the Loggerhead Shrike population.

MATERIALS AND METHODS

Three search methods were used during the 1995 survey. The first; and most labor-intensive method, was what I will refer to as Territory Watches. This search method was used to establish a basis for estimating the population of breeding shrikes, against which other methods are compared. A full description is given in Appendix A: Search Methods. To summarize, surveyors were asked to visit historical 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 during the last ten years were visited. 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. Reports of Loggerhead Shrikes from landowners led to territory discovery on a less consistent basis than the above. However, most landowner reports could be followed up by telephone prior to making a site visit.

The second search method is what I will refer to as Road Transects. This is the traditionally used search method employed by the DNR for monitoring shrike populations

in the state. Road Transects were conducted in Clay, Dakota, and Le Sueur counties. A full description is given in Appendix A. According to this method, 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. Participants were not aware of locations of known shrike territories along transect routes.

In Dakota County and in Clay County, traditional Road Transect routes were driven. Further Road Transects were added in Dakota County and in Le Sueur County to maximize possible shrike encounters based on the distribution of known active shrike territories. The participants in this survey were volunteers recruited from MNBird, the Minnesota On-line Birding Network, and from the University of Minnesota.

The third search method is what I will refer to as 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. Participants were also encouraged to use, their birding skills to decide where to look for shrikes and how long to spend looking in a given area. The emphasis of the search was to cover as much area as possible in a single day of observation.

In addition to field searches made using the above methods, posters were distributed in areas near historical breeding territories. Posters were given to volunteers to distribute using their discretion. Distribution points included, stores serving the farming community, convenience stores, and State Parks containing appropriate shrike habitat. Some posters were given to landowners. Though the number of and distribution of posters was not recorded specifically, about 200 posters were distributed in the above fashion.

RESULTS

Before presenting the results, I would like to give a cautionary note about the consistency with which the methods were interpreted and applied in the field. In some cases, particularly in Dakota County, the search method varied from the established Territory Watch protocol. At least 103 visits to territories in Dakota County including up to 23 visits to a single territory, are not presented in this report because of significant deviations from the standard protocol. Therefore, the extent to which some of: the results are comparable is questionable. However, my qualitative assessment is that the results would not have been very different had the protocol been strictly adhered to. This opinion is based on a within-method efficiency analysis which I present below. The reader should be aware that there was variation in effort and in the method of recording data.

Throughout the results section I refer to *`original observations.'* This term means 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 will focus only on first observations of single shrikes or pairs of shrikes on territory. No active shrike territories were discovered for the first time by any method other than Territory Watches.

Territory Watches Twenty-nine original observations of shrikes were made using the Territory Watch protocol. 22 Loggerhead Shrike nests were discovered (Table 5). An additional 5 cases have been classified as inferred nesting because more than one shrike was observed on the territory on more than one occasion. In four of these cases, observers searched for the nests, but could not find them. In one case, in Douglas county, the shrike was reported late in the season and was never seen during follow up visits.

Together this accounts for 27 nest attempts by Loggerhead Shrikes this summer. The remaining two original observations were of shrikes seen on territories only once and not subsequently found. It is assumed that they failed to nest on the territories on which they I were seen. Since shrikes will often re-nest in a single season, and since we did not have banded birds, we cannot know how many breeding pairs account fir these 27 nest attempts. In 1986, 29 pairs were known to account for 34 nest attempts and in 1987, 19 pairs were known to account for 27 attempts.

These 27 nesting attempts occurred in 14 counties (Table 2, Table 5) The 22 confirmed sites were all revisited after the end of the nesting cycle to record local data on nest-height and nest tree species. Average nest height was 1.97 m (maximum 4.35 m, minimum 0.53 m). Nest tree species are given in Figure 2.

The discovery of new pairs of shrikes using the Territory Watch method followed a curve of diminishing returns (Figure 1). Of the 29 first observations of shrikes on territories, 21 were seen on the first visit to that territory. Three were seen on they second visit and four were seen for the first time on the third visit to the territory. A few territories were visited more than three times because observers felt that the habitat on the historical site was likely to harbor breeding shrikes. In only one case was an original Shrike observation made on a visit beyond the third. It cannot necessarily be inferred from this that the curve continues to diminish after the third visit because only a very few territories received more than three visits. However, in the few anomalous cases in Dakota County where territories were visited many times, no new shrikes were ever found . I believe that this, coupled with the curve of diminishing returns, provides sufficient justification for the assumption that the 1995 results have not been seriously compromised by deviations from standard protocols.

In total, about 420 hours were spent looking for shrikes by this method, with an average of about 1 hour and 22 minutes per visit. These statistics are given for each county to

allow comparison of search effort between counties (Table 3). It should be noted that a straight comparison is not strictly possible since in some counties, for example Dakota, Sherburne, and Rice County, there are clusters of territories which are adjacent to one another. This allows for more efficient searching since a surveyor can simultaneously search more than one territory.

Road Transects Eight occupied shrike territories were known (from m 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. Only one observation was made of a shrike at more than one half-mile from a known territory . 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, 45:16 hours were spent on the transects and 11 observations of shrikes were made. Five of these observations were original (defined as first observation on territory by this method). This is an average of 9:03 hours per original shrike observation (Table 2).

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 Bremmer who were responsible for searching that county. A total of 67:30 people-hours were spent during this search, an average of 33:45 hours per original shrike observation.

Comparison of Methods

Interpretation of methods was divergent among the participants in field research. In particular, the habitat data and maps for indicating shrike sightings and search effort were interpreted with difficulty. The primary objective of locating as many breeding shrikes as possible was carried out with enough consistency to allow analysis. However, habitat data and trends in habitat data probably cannot be consistently compared. This may be due both to unclear communication of expectations to the field researchers and to limited time available to field researchers to carry out habitat assessment. Recommendations for future habitat assessment are made below in the Recommendations section.

Table 4 presents the number of person-hours spent per shrike discovered for each of the three methods. Road Transects are compared to the Territory Watches for percent of known shrikes observed as a way of comparing efficacy between these two methods. For the Road Transect method, the maximum possible number of territories that observers could have discovered are considered to be those within one quarter-mile of the transects. Accordingly, the Road Transects were about 50% effective when compared to the Territory Watches.

DISCUSSION

In 1986, Bonnie Brooks and her team found 37 nest attempts in 12 counties. In those same counties in 1995 we found 18 nest attempts, a decline of 51 percent. Additionally,

we found 9 nest attempts in counties in which the 1986 survey team did not search. Of the twelve counties in which we both searched, the same number of nest attempts were found in two, Fillmore County and Lac Qui Parle County (Figure). In nine counties we found a decline in nest attempts. In only one county did we find more nest attempts in 1995 than in 1986. This was in Dakota county where we found nine nest attempts in 1995, compared to two nest attempts in 1986 (Figure 2, Figure 3).

In making this comparison, it should be noted that there were differences in the search methods used in the 1986 and 1995 survey. The 1986 survey used the Road Transect method whereas the 1995 survey used Territory Watches.

Though it appears that these data support the hypothesis of a continued decline of Minnesota's breeding population of Loggerhead Shrikes, caution should be exercised in making this inference. Only the male Loggerhead Shrike is known to be philopatric. Neither the female nor young are (Brooks 1988, Yosef 1994). This, compounded by the fact that Minnesota, even historically, is at the very northern extreme of the breeding range of Loggerhead Shrikes, could lead to very large annual fluctuations of Loggerhead Shrike populations. It could also lead to considerable redistribution of breeding shrikes in only a few years. Further evidence of this can be found in the results of Bonnie Brooks' 1987 survey in which her team found 27 nest attempts in the same search area in which 37 nest attempts had been recorded the year before.

RECOMMENDATIONS

Although it is not certain that Loggerhead Shrike populations are continuing to decline in Minnesota, it is clear that they are not increasing. I recommend that the species continue to be monitored. Efforts to conserve suitable breeding habitat should also continue.

Short-term clustering of breeding pairs of Loggerhead Shrikes appears to occur in Minnesota. These clusters account for a large proportion (33% in 1995, 24% in 1986) of the total breeding population in the state. 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 two nest attempts were discovered, whereas in 1995 there were nine nest attempts. I recommend that effort be made to understand the dynamics that govern these short-term clusters of breeding birds.

This could be accomplished by banding nesting and hatching birds in Dakota County and estimating return rate and, possibly, dispersal, of this population. To get useful data, it would be necessary that a banding program be carried out in Dakota County for seven years, a long estimate of male Loggerhead Shrike lifespan.

In conjunction with an intensive banding program in Dakota County I recommend that the DNR continue to monitor historical territories throughout the state I believe that the

best method for doing this would be a modification of the Territory Watch. Specifically, I recommend the following changes be made to the Territory Watch protocol.

1. A one-day training/discussion session for all shrike field workers should be organized I to ensure standardized search effort and data collection.
2. Maximum time spent at a territory should be reduced from two hours to one hour.
3. All weather data should be removed from the data sheet.
4. Only one question about habitat should remain on the data sheet: "Does the territory contain suitable breeding habitat for Loggerhead Shrikes?"
5. Provide each field worker with blank data sheets which already, have the territory number and legal description written on them.
6. Keep the three observation windows and insist that the first observation take place between April 15 and May 15. If time does not allow all three visits, then the second visit should be eliminated, since it is the visit least likely to result in a new discovery of a nesting pair.
7. Use The Loon, Minnesota Birding, and MN Bird to actively solicit reports of Loggerhead Shrikes.

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Table 1: Anecodatal Evidence of Loggerhead Shrike Density in Southern and Western Minnesota, June 1926 (Roberts 1937)

Route Traveled	Date	No. Shrikes Observed
Minneapolis to Wilmar	June 17, AM	25
Wilmar to Pipestone	June 17, PM	19
Pipestone to Madison	June 25, AM	10
Madison to Ortonville	June 25, PM	7
Ortonville to Olivia	June 28, AM	16
Olivia to Minneapolis	June 28, PM	12
Total Observations		89

Table 2: Distribution of Breeding Loggerhead Shrikes in 1995, Confirmed and Inferred

County	1995 Nest Attempts
Big Stone	1
Clay	4
Dakota	9 (2 inferred)
Dodge	1
Douglas	1 (inferred)
Fillmore	1
Goodhue	1
Lac Qui Parle	2 (1 inferred)
Le Sueur	2
Lincoln	1
Meeker	1
Scott	1
Sherburne	1
Washington	1 (inferred)
TOTAL	**27 (5 inferred)**

Table 3: Efficiency 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	420:00:00	29	14:28:58	NA
Road Transects	45:16:00	5	9:03:12	5/10
Big Day Search	67:30:00	2	33:45:00	2/2

* Due to methodological differences, comparison is probably only valid between Territory Watches and Road Transects. Data for Big Day Search are provided for independent evaluation only.

Table 4: 1995 Search Effort by County (Territory Watch Only)

County	Total Time per County	Average Time per Visit
Benton	10:25:00	1:09:27
Big Stone	6:25:00	1:36:15
Blue Earth	4:45:00	1:11:15
Chippewa	4:00:00	1:00:00
Clay	86:05:00	1:24:45
Dakota	42:05:00	1:10:08
Dodge	2:00:00	2:00:00
Douglas[1]		
Fillmore	13:05:00	1:52:09
Goodhue	48:46:00	1:17:00
Houston	4:45:00	1:35:00
Jackson	2:30:00	2:30:00
Kandiyohi	8:40:00	2:53:20
Lac Qui Parle	48:50:00	1:28:47
Le Sueur	10:00:00	1:15:00
Lincoln	5:45:00	1:55:00
Lyon	4:15:00	1:25:00
Meeker	7:10:00	1:05:00
Morrison	12:15:00	1:21:40
Murray	1:00:00	1:00:00
Olmsted	4:30:00	1:22:30
Pipestone	4:55:00	1:13:45
Redwood	3:15:00	1:05:00
Rice	15:11:00	1:31:06
Scott	11:42:00	1:40:17
Sherburne	39:45:00	1:06:15
Swift	1:30:00	0:45:00
Wabasha	8:40:00	1:44:00
Washington[2]		
Winona	4:25:00	2:12:30
Yellow Medecine	0:45:00	0:45:00

[1] Late reception and follow-up of report for Douglas county, makes search effort there invalid for comparison with standard protocol

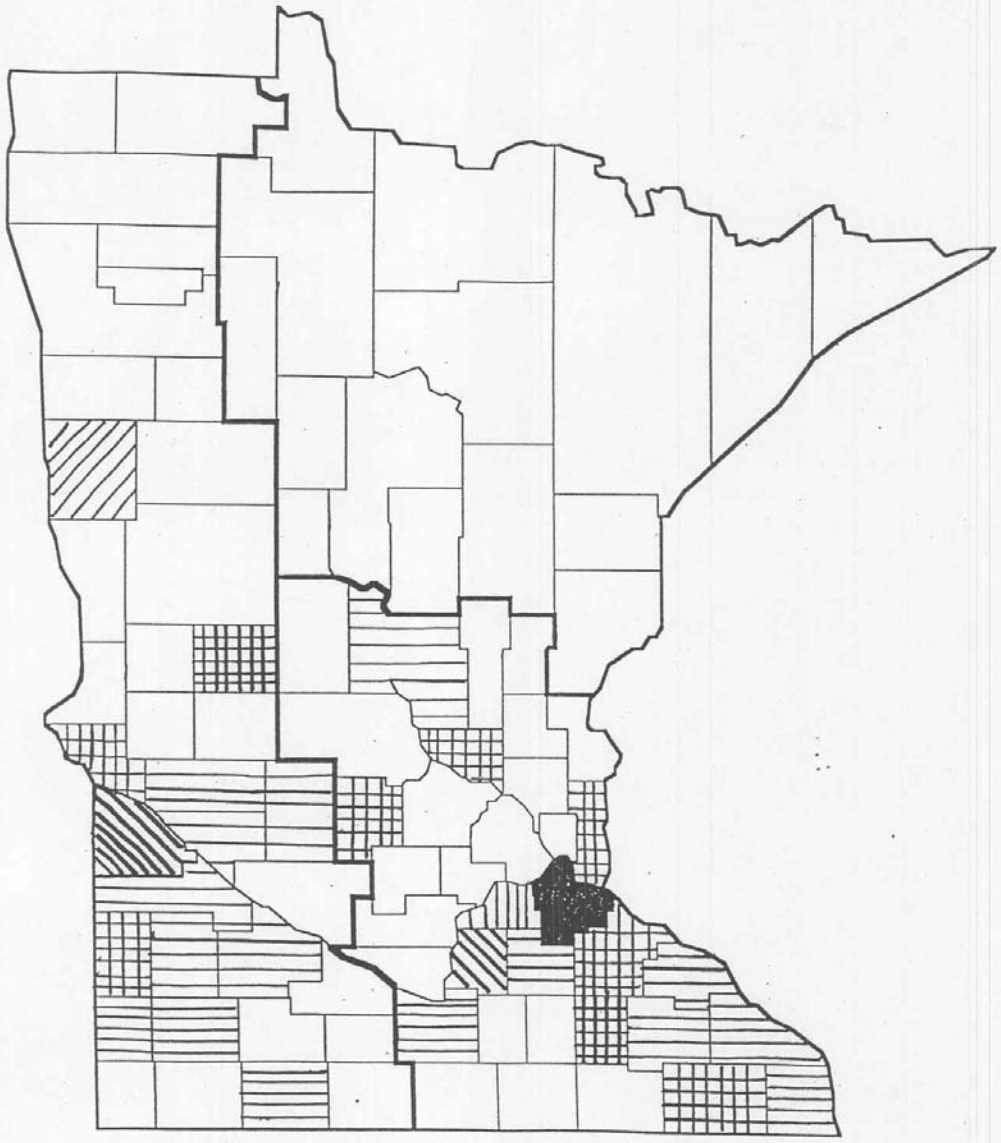
[2] No field reports were received for Washington County nest search

Table 5: List of Loggerhead Shrike Nests Found During 1995 Survey

	Twshp	Range	Section	Date of Nest Discovery	Date of First Shrike Observation	Last Shrike Seen	Nest Tree Species	Tree Height (m)	Nest Height (m)
Big Stone	121	45	wsw26	12-Jul	12-Jul		russian olive	4.60	2.36
Clay *	139	46	swne14	1-Aug			amer. plum	2.38	0.53
Clay	140	46	nwnw02	15-May	15-May	8-Jun	willow	8.30	4.35
Clay	140	46	nwse23	15-May	15-May	8-Jun	willow	3.55	1.90
Clay *	141	45	nenw08	28-Aug			amer. plum	2.17	0.70
Dakota *	112	19	nwnw04	15-Sep	9-Jun		amer. plum	3.45	1.51
Dakota	112	19	swne02	9-Jun	9-Jun	6-Aug	INFERRED NESTING		
Dakota	113	19	sene25		27-Apr	6-Aug	INFERRED NESTING		
Dakota	113	18	nwnw16	11-May	11-May		red cedar		1.44
Dakota *	113	18	nenw22	15-Sep	24-Jun		red cedar	6.00	1.69
Dakota	113	20	nese24	11-May	11-May		red cedar	4.67	2.36
Dakota	114	18	nene16	2-Jun	2-Jun		red cedar	2.24	2.21
Dakota	115	18	sese34	12-Jul	11-Jun		red cedar		1.97
Dodge	106	16	nesw35	13-Jun	13-Jun		red cedar	4.80	2.30
Fillmore	102	12	senw07	10-Jul	10-Jul		red cedar	3.00	1.65
Goodhue	111	18	nene06	17-May	15-May		amer. plum	3.40	2.15
Lac Qui Parle	116	46	nwnw05	22-Jun	11-May		Chinese elm	3.90	2.01
Le Sueur	109	26	nwnw05	19-May	5-May	23-Jun	red cedar	2.70	0.98
Le Sueur	109	26	ssw05	5-May			red cedar	5.40	2.50
Lincoln	112	46	nene12	14-Jun	14-Jun		hawthorne	3.25	2.20
Meeker	118	29	sese02	20-Jun	20-Jun		Blue spruce	7.10	2.70
Scott	114	24	sese14	28-Jul	16-Jun		red cedar	3.38	1.74
Sherburne	33	29	nene02	29-May	26-May		grape vine	na	1.50
Washington	27	21	21,28,27				INFERRED NESTING		

* The nests at these territories were discovered after they were no longer being used. Their strong resemblance to shrike nests and their central position to repeated 1995 shrike observations allow strong confidence in their identifcation as active loggerhead shrike nests during the 1995 breeding season.

Figure 2: 1995 Loggerhead Shrike Nest Attempts



Number of Nests Attempts

0

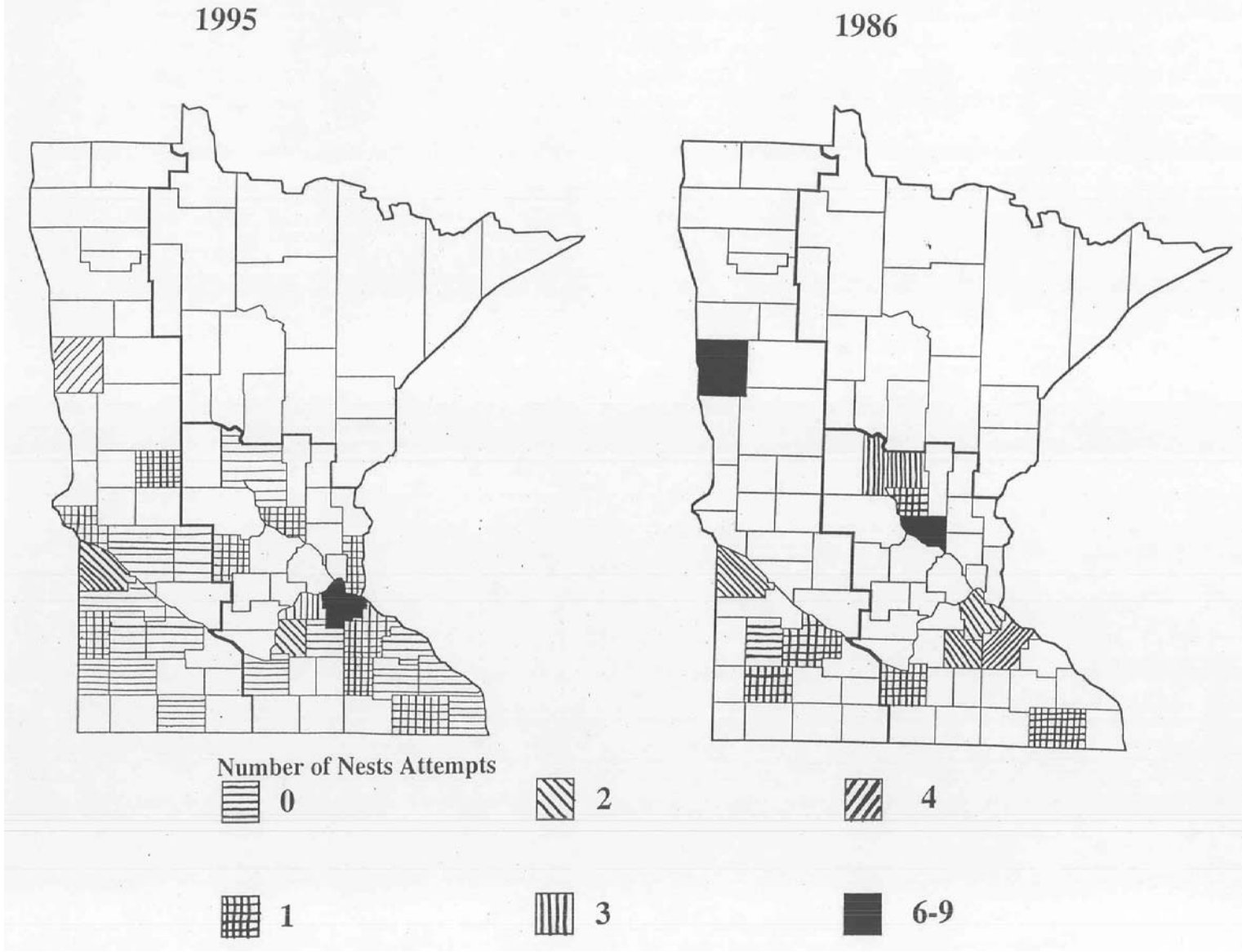
1

2

4

9

Figure 3: Comparison of Known Loggerhead Shrike Nest Attempts



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 986-present should be included in the 1995 census. In most cases this can be quickly determined fro 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 (1/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 so a cases landowners should be contacted for permission to enter property if suitable habitat is observed to 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/¼ /¼)**
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...

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 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, snags and tree tops.

6. A different copy of the route map should be used for each of the 2 runs of the rout. 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 margin.

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 to 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.

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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 go 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 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: s:

Ferruginous Hawk	Lark Bunting	A Y Longspur
Burrowing Owl	Henslow's Sparrow	Loggerhead Shrike
Say's Phoebe	Lazuli Bunting	His e-mail is: tony@mi112.MilIComm.com

Appendix B: page 1

Loggerhead Shrike Workshop
at the annual meeting of the
American Ornithologists Union
16-19 August 1995

Participants:

David Bird: Avian Science and Conservation Centre, McGill University, 21,111 Lakeshore Rd. Ste Anne de Bellevue, Quebec, H9X 3V9 Canada
Matt Etter: University of Minnesota & Minnesota DNR
Dale Gawlik: Everglades Systems Research, South Florida Water Management District, West Palm Beach, FL 33416-4680
Carola Haas: Virginia Polytechnical Institute
Catherine Koehler: US Navy, San Clemente, California
Fred Lohrer: Archibold Biological Station, Lake Placid Florida
Bruce Peterjohn: Pautuxent Environmental Science Center, National Biological Survey, Laurel, MD 20708
John Sauer: Pautuxent Environmental Science Center, National Biological Survey, Laurel, MD 20708
Reuven Yosef: International Birding Center Eilat, P.O. Box 77 , Eilat 88106, Israel

Numbered sections correspond to agenda items and are presented in the order discussed at the workshop.

1. Fred Lohrer, editor of the proceedings of the 1993 International Shrike Symposium said symposium proceedings will be available this October. They will be published by Sheraton Press: copy editor, James Wiley. The price has not yet been determine . Anyone wishing a copy should contact Fred Lohrer at the Archibold Biological Station, Lake Placid Florida.

3. Carola Haas proposed a mechanism for policy issues (e.g. captive breeding of shrikes) to be evaluated and either approved of or disapproved of by the Working Group up. *see handout. Some discussion followed:

RY suggested that policy statements concerning North American species could be sent to European members of the working group for comments

BP suggested that a `no reply' from any member be treated as a yes to place the burden of response on those who feel strongly about a particular issue.

Final consensus was that the list of voting members should be drawn from the list of members by the head of the Working Group and that the head of the group up would have the authority to decide upon the response based upon the response of the voting members. Thus much authority and confidence was placed on the judgment of the head of the group.

2. David Bird raised concern over resistance from the Canadian Government for his project to breed in captivity the declining subspecies of Loggerheads *(Lanius ludovicianus migrans). His* proposal included release in Pennsylvania of captive-reared shrikes. a noted that the greatest difficulty in releasing captive-bred shrikes will likely by high predation rates.

RY proposed that the working group should put its support behind David Bird to aid-in his effort to obtain permission to bring birds into captivity.

BP suggests a response is necessary from Montreal before Working Group can come out in support for David Bird. 'therefore it is necessary that:

1. David Bird get some response from the Canadian government
2. He should also let the ISWG know to whom they could write a letter of support for his proposal.

4. Update on some populations Idaho: Idaho's population seems to have declined by half. Time frame was not given, nor was population numbers.

North Dakota birds seemed to have a very late breeding season. Carola Haas reports that her population has fluctuated between 9 and 12 birds over the last 8-10 years. This year she had 8 or 9 occupied territories. She also reports that it seems common in small populations to have some territories with unpaired individuals.

RY suggests that a project be initiated to look for correlation between climate change and shrike breeding success. He mad a preliminary observation that a wet Spring seems to be bad for shrikes.

DG suggests that climate change could either affect shrikes directly or effects could be mediated through food availability or the effect of climate on vegetation.

Appendix C
1996 Loggerhead Shrike Census Form

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

Visit- 1'st_____ 2'nd_____

County: _____ Target Territory (EOR)#: _____

Location: 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 so, 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):**

(T/R/S/¼ of ¼): _____

Nest Site Characteristics:

Height:_____ Distance from nearest road:_____ #eggs present:_____

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

v. Notes: 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 (below) the actual nesting site. Include any information which might be useful for another observer to locate the nest in your absence.