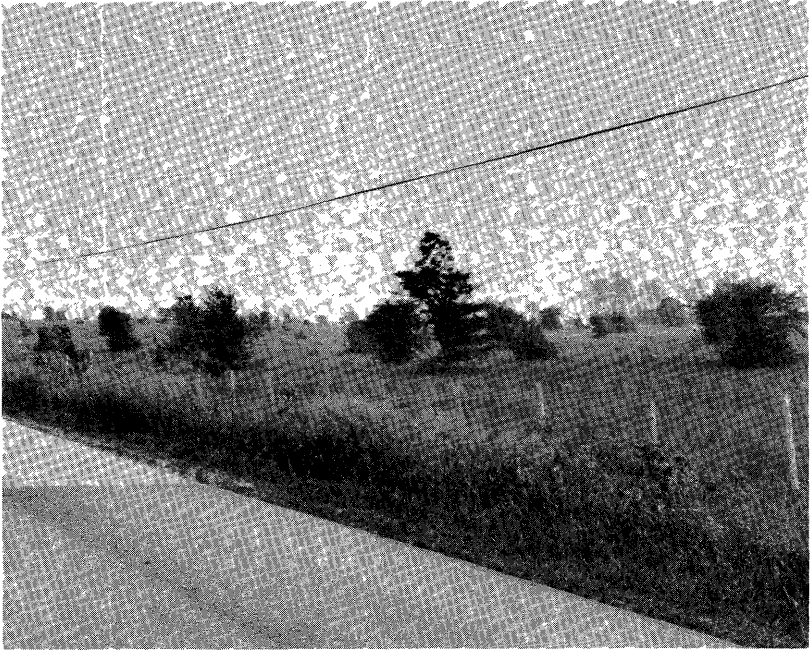




Habitat of Loggerhead Shrike in Franklin Co., New York.

POSSIBLE FACTORS INFLUENCING THE DISTRIBUTION, STATUS AND ABUNDANCE OF THE LOGGERHEAD SHRIKE (*LANIUS LUDOVICIANUS*) IN NEW YORK STATE

PAUL NOVAK

The Loggerhead Shrike (*Lanius ludovicianus*) is known to most birders for its peculiar habit of impaling prey on thorns and barbed wire. Its range extends from southern Canada to Mexico and from coast to coast. The species has experienced a significant population decline in many regions, including the northeast (Milburn 1981) and now is listed as Endangered in New York State. The reasons for its decline are unknown. Many factors have been suggested, including loss of habitat (Graber *et al.* 1973, Kridelbaugh 1983), contamination by pesticides (Anderson and Duzan 1978, Busbee 1977), competition with other species for food and nest sites, changes in regional weather patterns and even accidental death along roadways. In this paper I discuss each of these factors in relation to observations made at two Loggerhead Shrike nest sites in New York during the 1986 breeding season.

In his early account of the *Birds of New York*, Eaton (1914) described the Loggerhead Shrike as a species which moved into the state and gradually increased in numbers with the clearing of the land for agriculture, suggesting that the species originally was not present in New York State. Eaton considered 1869 to be the year of the first confirmed Loggerhead Shrike nesting in New York. He suggested that earlier reference to nesting Northern Shrikes (DeKay 1844) should be attributed to the Loggerhead Shrike. The following information make it likely that DeKay's observations represent a case of mistaken identity.

Prior to the description of three eastern subspecies of the Loggerhead Shrike (Palmer 1898) and the subsequent taxonomic revision by Miller (1931), there was confusion over the identity of all North American shrikes. Both shrike species may be present in New York during the early spring, as Loggerhead Shrikes arrive from the south to begin breeding activities before all Northern Shrikes depart for their breeding grounds farther north. This situation, if present in the 1800's, would have been an additional source of confusion for early ornithologists. A set of six eggs in the collection of the New York State Museum collected on 11 May 1902 was labeled "Northern Shrike" by the collector, William Conway. I examined these eggs, along with all other eggs and nests of both species in the collection. Size comparison indicates that the eggs are those of a Loggerhead rather than a Northern Shrike.

Regardless of its original status, the Loggerhead Shrike was considered to be a common breeding bird in western and central New York from the late 1800's through the first quarter of the twentieth century

(Bull 1974). A progressive decline in numbers occurred during the 1930's and 1940's (Bull 1974) and has continued to the present. The New York State Breeding Bird Atlas Project produced just ten records of confirmed breeding for this species during the time period 1980-85 (Janet Carroll *pers. comm.*).

Several states, including New York, recently have initiated projects to study potential causes of the shrike decline. I surveyed 57 locations for the presence of Loggerhead Shrikes between 1 May and 19 August 1986, including all ten locations where breeding was documented during the atlas project. Just two pairs of nesting shrikes were located during this search, both in Franklin County. Intensive observations were made at these nest sites on a weekly basis throughout the summer.

Loss of habitat has been cited as a factor in the decline of the Loggerhead Shrike by many authors (Graber *et al.* 1973, Kridelbaugh 1983, Bull 1974). Bull (1974) describes pastureland with an abundance of hawthorn and orchards as the two preferred breeding habitats of shrikes in New York. At both active nest sites located during my survey, the habitat was an active pasture of approximately 40 acres, with associated fencerows separating the pasture from adjacent agricultural land. Both pastures were dotted with widely scattered hawthorn (*Crataegus* sp.) shrubs four to twelve feet in height. Several of the breeding locations identified by the atlas project were in similar active pasture situations, while one of the records is from an orchard with surrounding farmland and three records from western New York are from an area with multiflora rose hedgerows bordering open fields, corn fields and pasturelands. In general, relatively open areas with the presence of thorny shrubs for impaling stations seem to be required by Loggerhead Shrikes in New York. Cadman (1985) describes similar habitat preferences in Ontario.

As a predator which feeds upon small vertebrates and large insects, the shrike occupies a position near the top of food webs. Hence, shrikes are prone to accumulate residues from toxic chemicals, which have been shown to have severe effects on breeding success of other predatory birds, such as the Peregrine Falcon and Bald Eagle. Using Loggerhead Shrike eggs from Illinois, Anderson and Duzan (1978) found that eggshells were significantly thinner in 1971-72 than they were in 1875-1895. They also found an average concentration of 21.89 ppm DDE in 69 shrikes collected during 1971 and 1972. Contaminants can affect birds directly as well. In a laboratory study Busbee (1977) found that with levels of 2 ppm Dieldrin in their diet, all young shrikes in his study died within 103 days. Although DDT and Dieldrin are no longer in use, the potential effects of the pesticides which have replaced them are unknown. At one of the two sites studied this summer, both adults and the recently fledged young frequently were observed foraging along the edges of cornfields adjacent to the pasture. Corn fields

in New York are often treated with pesticides such as carbofuran, parathion and Diazinon. At the second nest site a single addled egg was collected from the nest two weeks after the other eggs had hatched. The egg will be analyzed to determine if it contains toxic residues.

Hedgerows, fences, telephone poles and electrical wires provide ideal hunting perches and serve to attract shrikes to roadways. Accidental death along roadways has been ranked as a major cause of mortality in shrikes, especially fledglings (Cadman 1985) and has been suggested as a factor in the decline of the species in the northeast (Bull 1974). The considerable increase in traffic since the early 1930's is likely to have increased the danger from automobiles (Cadman 1985). One or two road killed shrikes were found in each of several years at the Sawyer Road atlas location in Orleans County in western New York (Bob Spahn *pers. comm.*). The shrikes at one of the two sites studied this past summer frequently foraged from power lines and fenceposts alongside the road and were often observed flying low across the road and dropping beside prey at the road's edge. On several occasions I observed the fledglings at this site picking insects off the road surface, and on 7 July they were even fed by an adult while sitting in the middle of the road. While none of the shrikes at this site was killed by passing vehicles, the potential impact of road kills on shrike populations which are at low densities should not be overlooked.

The American Kestrel, European Starling and Eastern Kingbird all have been noted as species in apparent competition with shrikes. Cadman (1985) suggests that competition with starlings for food may have reduced shrike numbers. European Starlings probably take many of the same insects as do shrikes and starling populations in agricultural areas throughout the northeast have steadily risen over the past several decades. Dead elm trees in hedgerows and forest edges adjacent to agricultural land provide a multitude of nest sites for this prolific species. At my study sites many starling pairs had raised one brood successfully and had started on a second clutch by the time the young shrikes were preparing to leave the nest. By midsummer flocks of 30-50 starlings were foraging throughout the territories of both families of shrikes. Shrikes egest small pellets similar to those produced by owls, which contain undigested bones and insect parts useful in food habits determinations. Eight pellets were collected this summer. Gross inspection revealed that they were composed largely of the undigested wing parts of various beetles. Food habits information may prove useful as a guide to sampling the prey populations on which shrikes depend and may allow us to assess the degree to which an expanding starling population has affected shrike numbers.

Recent evidence suggests that changes in climatic trends should be investigated as a potential factor in the decline of the Loggerhead Shrike.

The Red-backed Shrike (*Lanius collurio*), a European species which occupies a niche similar to that of the Loggerhead Shrike in North America, has undergone a gradual decline in Britain during the past 70 years (Bibby 1973, Peakall 1962). Bibby (1973) and Peakall (1962) consider an "adverse climatic trend" as one of the major factors in the decline. They suggest that cooler and wetter summer weather decreases the availability and numbers of large flying insects and beetles which comprise the shrikes' main prey (Bibby 1973). In a two year study in Missouri, Kridelbaugh (1983) documented the loss of eight of 28 shrike nests under observation during a year of heavy rainfall and cold temperatures. Just one of 27 nests was lost due to this cause during the less severe weather the previous year. One of the two pairs of shrikes under observation in New York State this summer experienced a nest failure early in the nesting season. While the behavior of the adult shrikes on 21 May seemed unusual for birds with a completed nest, it was not until several weeks later, when I discovered a completed second nest, that I confirmed the pair had been unsuccessful in their first nesting attempt. It is possible that several consecutive days of hard, cold rain in the area between 15 and 21 May were responsible for the initial nest failure. Cold, wet weather may also lead to a reduction in brood size (Cadman 1985). It is notable that several of the breeding bird atlas records were observations of adults with just two fledged young (Janet Carroll *pers. comm.*). Only five young shrikes were successfully fledged from the two nest sites studied this summer.

Observations such as those reported here are necessary in order to determine habitat requirements, productivity, food habits and other basic aspects of Loggerhead Shrike biology. Such information is essential to assess the possible role of the many factors which may be involved in the widespread decline of this unique species.

Acknowledgments

I thank William Brockway and Gus Smythe for allowing me access to their land throughout the summer. I also thank Charles Smith and Milo Richmond for reviewing this paper, Peter Nye for encouragement during the field season, and David Steadman for permission to examine shrike nests and eggs in the collection of the New York State Museum. The majority of projects of the Department of Environmental Conservation's Division of Fish and Wildlife Endangered Species Unit are funded by "Return a Gift to Wildlife." I thank the contributing taxpayers who make possible the work of the Endangered Species Unit.

Literature Cited

- Anderson, W. C., and R. E. Duzan. 1978. DDE residues and eggshell thinning in loggerhead shrikes. *Wilson Bull.* 90: 215-220.
Bibby, C. 1973. The red-backed shrike: a vanishing British species. *Bird Study* 20: 103-110.
Bull, J. 1974. *Birds of New York State*. Doubleday Natural History Press, New York, New York.

- Busbee, E. L. 1977. The effects of dieldrin on the behavior of young shrikes. *Auk* 94: 28-35.
- Cadman, M. D. 1985. Status report on the loggerhead shrike (*Lanius ludovicianus*) in Canada. Unpublished report prepared for the Committee on the Status of Endangered Wildlife in Canada-COSEWIC. 97 pp.
- DeKay, J. E. 1844. *Zoology of New York, Part 2: Birds*. Carroll and Cook, Albany, New York.
- Eaton, E. H. 1914. *Birds of New York, Part 2 (2nd Ed.)*. New York State Museum, Albany, New York.
- Graber, R. R., J. W. Graber, and E. L. Kirk. 1973. Illinois birds: Laniidae. State of Illinois, Dept. of Registration and Education, Biol. Ser. No. 83.
- Kridelbaugh, A. L. 1983. Nesting ecology of the loggerhead shrike in central Missouri. *Wilson Bull.* 95: 303-308.
- Milburn, T. 1981. Status and distribution of the loggerhead shrike *Lanius ludovicianus* in the northeastern United States. Unpublished report prepared for U.S.D.I., Fish and Wildl. Serv., Office of Endangered Species. 77 pp.
- Miller, A. H. 1937. Systematic revision and natural history of the American shrikes (*Lanius*). *Univ. Calif. Pub. Zool.* 38 (2): 11-242.
- Palmer, W. 1898. Our small eastern shrike. *Auk* 15: 244-258.
- Peakall, D. B. 1962. The past and present status of the red-backed shrike in Great Britain. *Bird Study* 9: 198-216.

The Division of Fish and Wildlife of the New York State Department of Environmental Conservation and the Cooperative Fish and Wildlife Research Unit at Cornell University have entered into an agreement which will provide for continued study of the Loggerhead Shrike in New York for the next two years. Birders throughout New York State may play an active and important role in this study by providing assistance in locating and observing nesting shrikes. Volunteers will be sought for several mass searches for Loggerhead Shrikes during the breeding season in selected areas, and a statewide system for reporting observations of any Loggerhead Shrikes will be established. Member clubs of the Federation of New York State Bird Clubs and all Breeding Bird Atlas Project participants will be receiving details concerning the searches and the reporting system in upcoming months. Anyone with information concerning active, or recently active nest sites of Loggerhead Shrikes in New York should contact Paul Novak at 306 Fernow Hall, Department of Natural Resources, Cornell University, Ithaca, New York 14853.

Room 306 Fernow Hall, Department of Natural Resources,
Cornell University, Ithaca, New York 14853