

FINAL REPORT
SECTION 6
ENDANGERED SPECIES ACT



FEDERAL AID PROJECT E-1-4
ECOLOGY AND MANAGEMENT OF ISOLATED POPULATIONS OF THE
BLACK-CAPPED VIREO (Vireo atricapillus) IN OKLAHOMA

APRIL 1, 1989 - MARCH 31, 1990

GRZYBOWSKI, J.A. 1989. Ecology and management of isolated populations of the Black-capped Vireo (Vireo atricapillus) in Oklahoma. Oklahoma Dept. Wildl. Conserv. Performance Report E-1-4.

ABSTRACT: Areas in Oklahoma where isolated groupings of vireos have been observed since 1985 were searched in 1989. Only two of these contained Black-capped Vireos: the Salt Creek site, Blaine County, and a site near Scott, Caddo County

A total of 13-14 adult vireos could be located, including seven to eight males and six females. Eight to ten young were produced by three of the four females present in Blaine County. However, no young were produced at the Scott site. Two nests with complete clutches were parasitized. All three nests producing vireos however did so without intervention (i.e. without cowbird egg removal, or cowbird trapping).

Banding showed three of six males (50%) and two of two females with bands in 1988 returning in 1989. Overall one-year detected returns for these isolated groupings are 48% (11 of 23) for males, and 46% (six of 13) for females. The two SY males detected in Blaine County were more than had been observed for all previous years since 1985. Nonetheless, recruitment is clearly low.

PERFORMANCE REPORT

State of Oklahoma Project Number E-1-4

Project Type: Endangered Species.

Project Title: Ecology and management of isolated populations of the Black-capped Vireo (Vireo atricapillus) in Oklahoma.

Project period: April 1, 1989 - March 31, 1990.

Project objectives: 1) to monitor the use of breeding sites where Black-capped Vireos (Vireo atricapillus) had been found in Blaine, Caddo and Canadian counties, Oklahoma. This includes searches in and around these breeding sites to attempt to locate peripheral birds or nearby groups of vireos;

2) to obtain an estimate of pair success accomplished by evaluating the number of offspring produced by all pairs of adult Black-capped Vireos found during May (1989);

3) to enhance reproduction of the Black-capped Vireos at breeding localities by interference with Brown-headed Cowbirds (Molothrus ater) nest parasitism (through removal of cowbird eggs and young from vireo nests);

4) to continue to estimate mortality and recruitment as determined through return of banded vireos (continuation beyond 1989 will be necessary to complete this objective);

INTRODUCTION

The Black-capped Vireo (Vireo atricapillus) formerly nested in scrub-oak habitats from south-central Kansas through central Oklahoma and central Texas to central Coahuila, and possibly Nuevo Leon and Tamaulipas in Mexico (Graber 1961, American Ornithologists' Union 1983). However, it has not been reported in Kansas since 1953 (Tordoff 1956, Graber 1961), and is gravely endangered in Oklahoma (Grzybowski et al. 1986, Grzybowski 1987, Ratzlaff, 1987).

The known range of the Black-capped Vireo (Vireo atricapillus) in Oklahoma has been reduced to three general areas, this in spite of extensive and systematic searches through its historically reported range in west-central, central, and south-central Oklahoma during 1985, 1987 and 1988 (Grzybowski 1985, 1988a, 1989a). These three areas are in Blaine County, southwestern Canadian and immediately adjacent Caddo counties, and in the Wichita Mountains (including the Wichita Mountains National Wildlife Refuge and Fort Sill Military Reservation).

During 1988, fewer than 200 vireos could be located, most in the Wichita Mountains. While this represented a substantial increase in detected vireos from 1987, only 16 adults were found in the other two areas (Grzybowski 1989a). These numbers located outside the Wichita Mountains are similar to those detected in the previous four years (Grzybowski 1985, 1987, 1988a, 1989a).

Outside the Wichitas, vireos have suffered nest parasitism by Brown-headed Cowbirds (Molothrus ater) documented at greater than 90% most years (Grzybowski 1985, 1987, 1988a, 1989a).

Because no vireos are naturally produced from parasitized nests, this parasitism remains their greatest immediate threat. Production of unprotected vireos in Oklahoma was 0.33 young/pair/year, far below that necessary to maintain their populations. Many of the adults detected had been banded in previous years. In addition, almost no first year males are being noted further verifying poor production. Almost all of the known vireo young produced in these areas were from nests from which cowbird eggs were removed.

With the very low numbers of Black-capped Vireos in Oklahoma, some monitoring of breeding adults needs to be continued. Reproductive success should be monitored, and efforts to enhance reproduction through interference with cowbird nest parasitism should be employed. These data are also necessary to assess changes in the population status of the vireos, and in identifying if and where additional management options might be useful.

METHODS

Localities where vireos had already been found during surveys and in previous years (Grzybowski 1985, 1988a, 1989a) were revisited, and vireo territories in these areas mapped. These included the Blaine County locality in the upper reaches of Salt Creek (north of Watonga), and the sites in extreme southwestern Canadian County and immediately adjacent Caddo County (see Grzybowski 1985, and 1988 for list and description of

specific localities). Peripheral searches were conducted around these areas as well to locate any potential satellite groups or expansion.

At each of the breeding localities monitored, the number of adults was carefully determined, and their territories mapped. The observations for each visit to a male vireo territory were recorded. Males were located and followed to determine if they were mated, to locate females (if present), and to assess reproductive activity (nests or young).

Since males are involved in every step of the breeding process (including incubation, nest-building, and care of nestlings and fledglings; Graber 1961, pers. obs.), determinations of mated and nesting status, and pair success were established by following activities of male vireos at intervals throughout the nesting season. Care of fledglings by males may continue for 30-40+ days after the young leave the nest (Graber 1961, pers. obs.). Although some pairs split fledged broods between parents for care, and the female may on rare occasions care for the entire brood (pers. obs.), it was still possible to establish with high reliability whether or not each pair fledged young, even if every nesting attempt was not discovered, by monitoring males at intervals spaced as much as 20-30 days apart.

Visits of all sites monitored were made throughout the potential nesting period and beyond from 6 May through 10 September 1989. Interference with cowbird nest parasitism was conducted through the location and removal of cowbird eggs from active vireo nests, and also the removal of young cowbird

nestlings or fledglings when discovered. These were the only mechanisms of interfering with cowbird nest parasitism that were employed for these isolated groupings.

Attempts were made to capture and color-band those adult Black-capped Vireos located during the study and still unbanded. Mist nets, in conjunction with tape recordings of vireo songs and wooden decoy models of male Black-capped Vireos, were used in attempts to capture males. Attempts at capturing females focused on placing mist nets in lanes of travel near active nests, or at times when females were traveling with the males; however, caution was used in all cases to avoid undue disturbance or harassment of both males and females. Nets were placed at some distance from the nests, and attempts for females were made only when the nests were known to be at a late enough stage where abandonment was not a concern. A policy of priority for vireo reproductive success over color-banding was employed.

A unique combination of color and aluminum leg-bands was used for each adult male or female captured. Thus, specific individuals can be identified in subsequent years without recapture. However, all young in a given year were banded with the same color and aluminum leg-band combination unique only for that year; these combinations were not used for any of the adults.

All captured adult birds were photographed and aged (in most cases) by the condition of their primary coverts. Because juveniles of many passerines have an incomplete pre-basic molt (into first-winter feather) where they retain their juvenile

primaries, rectrices and primary coverts into the following breeding season, differences in tone and wear between these retained juvenile feathers and feathers of adults have potential to be used in aging (Humphrey and Parkes 1959). However, aging was limited to distinguishing between birds in their first breeding season (designated here and throughout as SY [meaning in second calendar year of life] in parallel with use by U.S. Fish and Wildlife Service Bird Banding Lab) and those older designated ASY (=after second calendar year of life). In Black-capped Vireos, the differences in plumage wear are best expressed in the primary coverts which are browner, more worn and with buff edgings in SY birds rather than blackish with greenish-yellow edgings in ASY individuals (Grzybowski 1988b).

Male Black-capped Vireos undergo delayed plumage maturation, a phenomenon where the SY male (in his first breeding season) takes on a plumage similar to that of the female (see Selander 1972, Rohwer et al. 1980, Lyon and Montgomerie 1986). SY males show essentially gray napes, with gray cornering into the superoposterior border of the white "spectacles." However, other male vireos, of uncertain age, but considered here as gray-ASY (after second calendar year in age) may show varying but lesser amounts of gray up the nape. The average age of these gray ASY males may be TY (or in their third calendar year or second breeding season), though this has not been well established (Grzybowski 1988b). Use of gray in aging is discussed in Grzybowski (1988b) and is validated by brown (rather than

blackish) and worn condition of primary coverts with tan (rather than greenish-yellow) edgings in SY males captured and banded.

RESULTS AND DISCUSSION:

Only 13-14 adult Black-capped Vireos could be located in the isolated groupings during 1989. They included seven to eight males and six females (Table 1; Figures 1 and 2). This is down slightly from the 16 detected in 1988, but is still very similar to counts made since 1986. However, among the sites sampled, only two of the five sites active in 1985 still had vireos in 1989. They were the Salt Creek site in Blaine County, and the Scott site in Caddo County. During 1989, vireos were no longer present at the Methodist Canyon site, a site probably occupied continuously since 1953 or earlier (Grzybowski *et al.* 1986). This included the disappearance of a bird originally banded as an ASY male in 1984.

At the Scott site, only one male was detected by mid-May. No females were noted. However, on a visit in June, a previously undetected pair was observed, including the banded male present in 1987 and 1988. This pair may have been present in the area during May, and shifted their territory. The area of this banded bird's territory had been adequately searched in May, so it was likely not present there at that time. While the first male was still believed unmated in June, he accompanied a female during mid July. Surprisingly, this female was captured and discovered

to be a female banded at the Niles site (about 5 mi. away) in 1986. She had gone undetected in 1987 and 1988.

Banding showed three of six males (50%) and two of two females with bands in 1988 returning in 1989 (Table 2). Overall one-year detected returns for these isolated groupings are 48% (11 of 23) for males, and 46% (six of 13) for females. These results are almost identical to the percent detected return of males from the smaller groupings in a Texas sample (49%; 31 of 63), but lower than the detected return in the larger main "colonies" of vireos (Grzybowski 1989b). The percent of one-year detected return for females is similar to that in the main Texas colonies (44%; 29 of 66). However, these include two assumed returns of a female at Scott undetected for two seasons. None of the four young banded in these isolated Oklahoma groupings has been detected again.

All of the adults detected in 1989 can be accounted for by adults known alive in 1988 or young successfully fledged in 1988. Two SY males located in Blaine County in 1989 could have been unbanded young produced at that site in 1988. They were two of only three SY males detected in these groupings since 1986 (Table 3). Recruitment appears to be very limited in these isolated groupings.

A total of eight nests were located. However, only two were located with clutches, both parasitized by cowbirds (Table 4). A third was found after the young had fledged. A fourth was suspected as one successfully fledging vireo young. The fourth nest was located as a platform when the SY male was still

unmated. One month later, it was complete with at least one dropping in it, indicating a young had been present in the nest. This SY male was attending at least one young. To add to the complication of this story, however, a banded female with young was being attended by the adjacent territory holding male who also had an active nest with another female (unbanded) that had just been parasitized. The banded female was assumed to have been mated to the SY male and moved off his territory with one to two young.

One other nest located was completed, but empty, and was believed to be recently abandoned. Another three nests located never advanced beyond very preliminary strand and rudimentary platform stages. Two of these were initiated by an unmated SY male; the third was begun by a pair.

The four females in Blaine County fledged 8-10 young. The two females in Caddo County did not produce any young (Table 4), though one of these females was only first observed in July with a male that was believed unmated until that time. Thus production was 1.33 to 1.66 young/female. Since all the young were produced in Blaine County, and this group could be considered a separate population, production for this group could be assessed as 2.0 to 2.50 young/female.

SUMMARY

Areas in Oklahoma where isolated groupings of vireos have been observed since 1985 were searched in 1989. Only two of

these contained Black-capped Vireos: the Salt Creek site, Blaine County, and a site near Scott, Caddo County

A total of 13-14 adult vireos could be located, including seven to eight males and six females. Eight to ten young were produced by three of the four females present in Blaine County. However, no young were produced at the Scott site. Two nests with complete clutches were parasitized. All three nests producing vireos however did so without intervention (i.e. cowbird egg removal, or cowbird trapping).

Banding showed three of six males (50%) and two of two females with bands in 1988 returning in 1989 (Table 2). Overall one-year detected returns for these isolated groupings are 48% (11 of 23) for males, and 46% (six of 13) for females. The two SY males detected in Blaine County were more than had been observed for all previous years since 1985. Nonetheless, recruitment is clearly low.

RECOMMENDATIONS

1.) Monitoring of known sites should continue on an annual basis to log the history of use by vireos at these sites. An effort should be made to count all vireos present, to assess the probable age class of the males and to locate females. These data can be used to help direct potential management activities.

2.) Nesting activity and productivity should also continue to be monitored. This should include a late season survey of

pair success. These data can be used to assess the fecundity of these remnant populations, and are also a means for interfering with cowbird nest parasitism.

3.) Banding attempts should continue for all adults and as many young as possible to assess turnover, dispersal and local movements (both within and between seasons) in the population. This is a long-term recommendation. However, care should be taken so as not to unduly disturb the vireos and interfere with breeding success.

4.) The Blaine County population is small, but the area could very well support more Black-capped Vireos. Trapping of cowbirds might be considered at this site, though location of the territories and access will make this difficult. Risk of failure in developing this population is still high, though cowbird trapping may be the only method with any potential of preventing this group from going to extinction.

5.) Should the number of birds in the isolated groupings show signs of increasing, an analysis of west-central Oklahoma using remote sensing, or aerial photography may still be useful. This could identify the amounts of potential habitat still present, and develop strategies for locally increasing potential habitat in areas of vireo population expansion.

ACKNOWLEDGMENTS

Financial support for this study was received from the Nongame Program of the Oklahoma Department of Wildlife Conservation with funds from the Endangered Species Act.

Charles Wallace, Harold Namminga, John Skeen, Albert Lynd, Joyce Mounce, David Koehn, and Nancy Bowers provided administrative support.

Richard Phelps allowed access to the Methodist Canyon Camp site; Roy Boeckman for his property in Blaine County. My wife Eileen was graciously tolerant of my activities on this project.

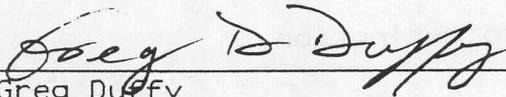
PREPARED BY: Joseph A. Grzybowski
Department of Biology
Central State University
Edmond, OK 73060-0184

APPROVED BY: Oklahoma Department of Wildlife Conservation



Harold E. Namminga
Federal Aid/Research Coordinator

Date 1-18-90



Greg Duffy
Chief, Game Division

Date 1-18-90

LITERATURE CITED

- American Ornithologists' Union. 1983. Check-list of North American birds. Sixth Edition. Allen Press, Lawrence, Kansas. 877p.
- Graber, J.W. 1961. Distribution, habitat requirements, and life history of the Black-capped Vireo (Vireo atricapilla). Ecol. Monogr. 31:313-336.
- Grzybowski, J.A. 1985. Population status of the Black-capped Vireo in Oklahoma - 1985. Report, Nongame Program, Oklahoma Dep. Wildl. Conserv., Oklahoma City, OK. 76p.
- Grzybowski, J.A. 1987. Population and nesting ecology of the Black-capped Vireo (Vireo atricapillus) in Oklahoma. Oklahoma Dep. Wildl. Conserv. Performance Report E-1-1. 39p.
- Grzybowski, J.A. 1988a. Population and nesting ecology of the Black-capped Vireo (Vireo atricapillus) in Oklahoma. Oklahoma Dep. Wildl. Conserv. Performance Report E-1-2. 55p.
- Grzybowski, J.A. 1988b. Black-capped Vireo investigations. Part 1: Population and Nesting Ecology. Report, Office Endangered Species, U.S. Fish Wildl. Serv., Albuquerque, N.M. 82 p.
- Grzybowski, J.A. 1989a. Population and nesting ecology of the Black-capped Vireo (Vireo atricapillus) in Oklahoma. Oklahoma Dep. Wildl. Conserv. Final Report E-1-3. 78p.
- Grzybowski, J.A. 1989b. Black-capped Vireo investigations: Population and nesting ecology. Interim Report, Office

- Endangered Species, U.S. Fish Wildl. Serv., Albuquerque, N.M. 51p.
- Grzybowski, J.A., R.B. Clapp, and J.T. Marshall, Jr. 1986. History and current population status of the Black-capped Vireo in Oklahoma. *Am. Birds* 40:1151-1161.
- Humphrey, P.S., and K.C. Parkes. 1959. An approach to the study of molts and plumages. *Auk* 76:1-31.
- Lyon, B.E., and R.D. Montgomerie. 1986. Delayed plumage maturation in passerine birds: Reliable signaling by subordinate males. *Evolution* 40:605-615.
- Rohwer, S., S.D. Fretwell, and D.M. Niles. 1980. Delayed plumage maturation and the deceptive acquisition of resources. *Am. Nat.* 115:400-437.
- Ratzlaff, A. 1987. Endangered and threatened wildlife and plants; Determination of the Black-capped Vireo to be an endangered species. *Federal Register* 52 (193):37420-37423.
- Selander, R.K. 1972. Sexual selection and dimorphism in birds, pp. 180-230. In B.G. Campbell (Ed.), *Sexual selection and the descent of man*. Aldine Press, Chicago, Illinois.
- Tordoff, H.B. 1956. Checklist of the birds of Kansas. *Univ. Kansas Mus. Nat. Hist. Publ.* 8:307-359.

FIGURE 1

FIGURE CAPTIONS

FIGURE 1. Locations of Black-capped Vireo territories at the Salt Creek site, Blaine County, Oklahoma during 1989. Solid circles enclose territories. Circle enclosed by dashed lines indicates uncertain territory.

FIGURE 2. Locations of Black-capped Vireo territories near Scott, Caddo County, Oklahoma during 1989. Solid circles enclose territories.

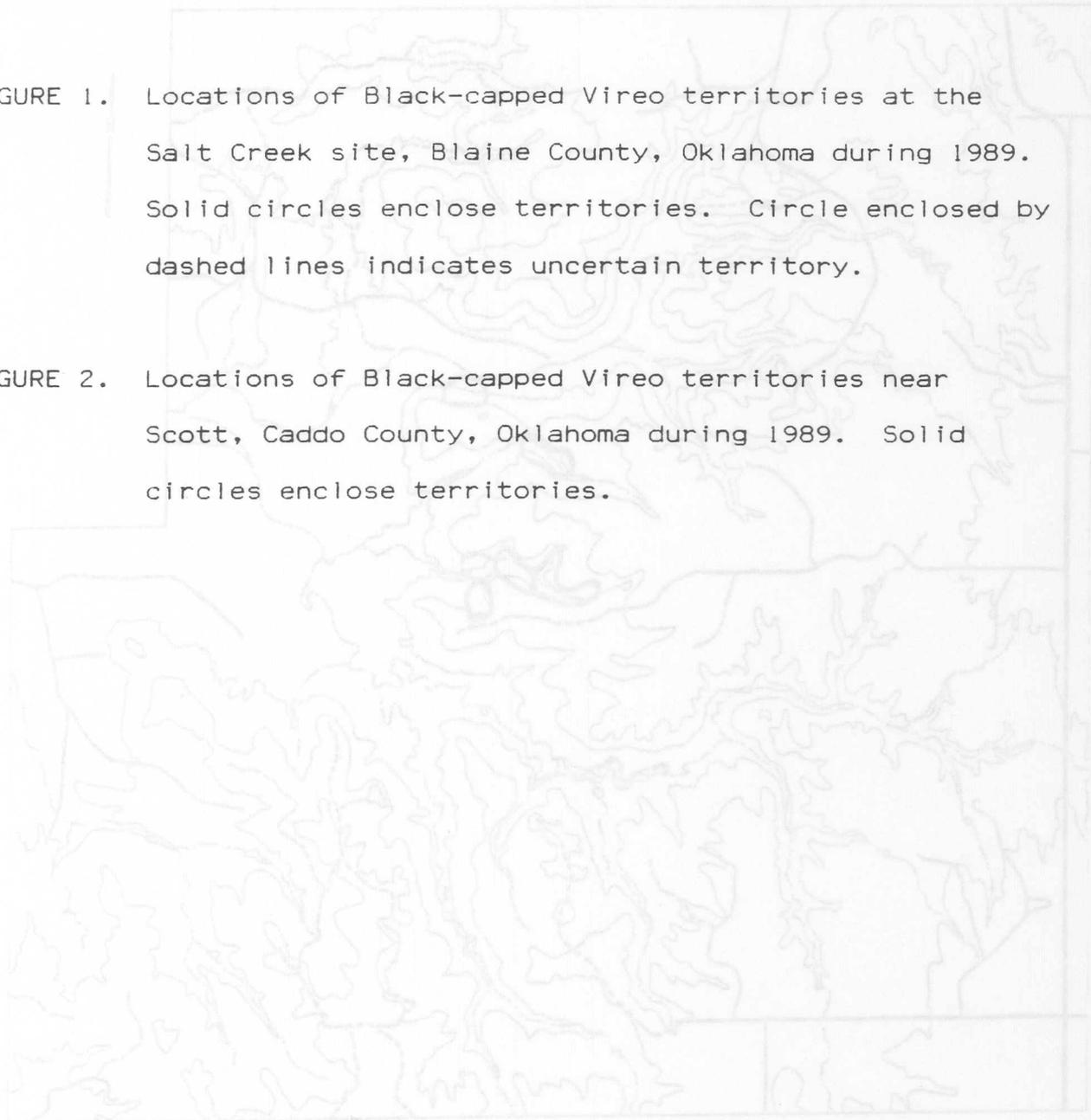
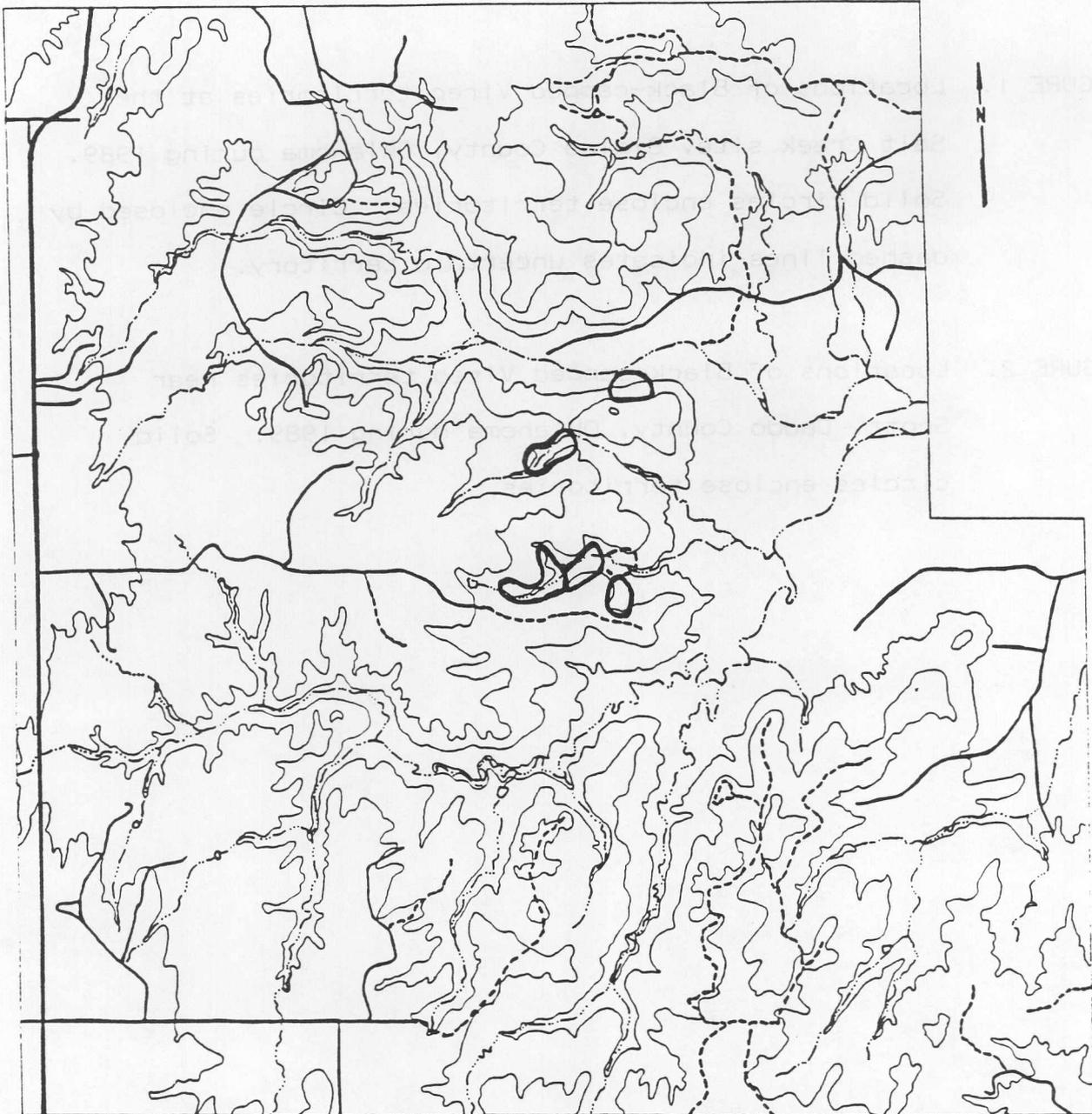


FIGURE 1



0 .5 1

TABLE 1. Numbers of adult Black-capped Vireos located in Blaine, Cabdo and Condon counties, Oklahoma from 1985 to 1989 and numbers of young produced.

County	1985					1986					1987					1988					1989				
	Locality					Locality					Locality					Locality					Locality				
Blaine																									
Salt Creek																									
Cadotaw																									
Cabdo Co. 11																									
Methodist Camp																									
Kiles																									
Cadot																									
Scott																									
TOTALS																									
Total adults																									

FIGURE 2

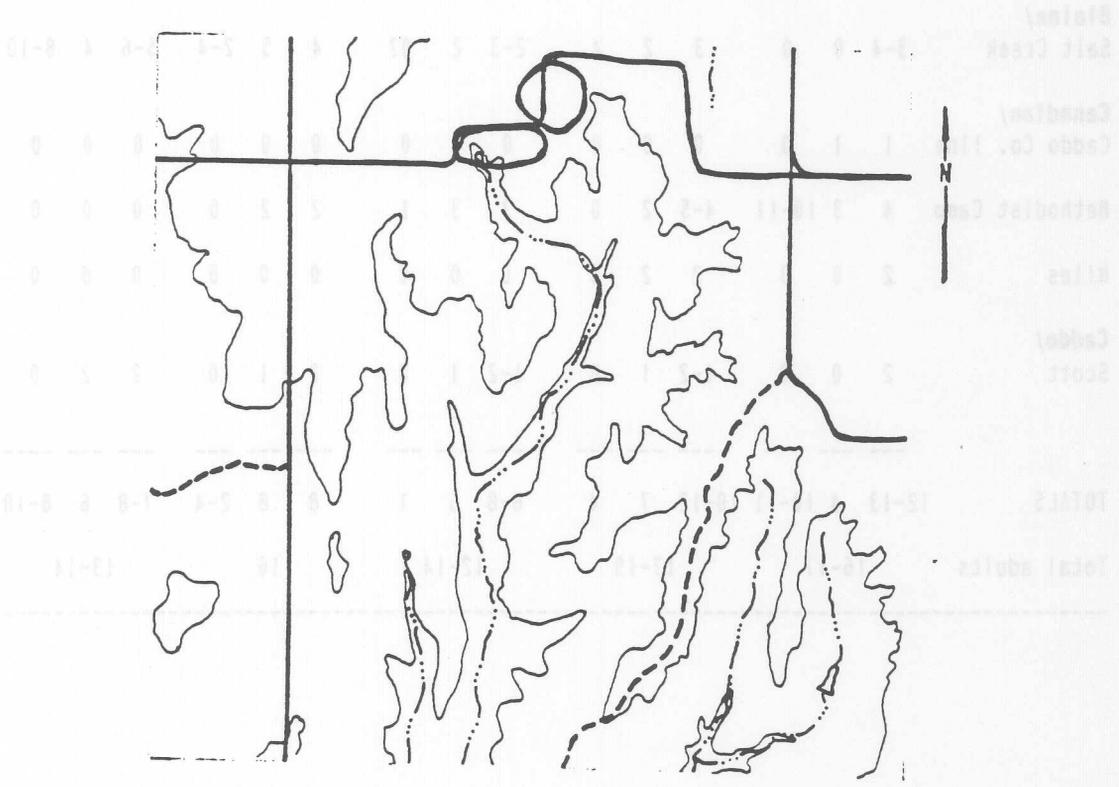


TABLE 1. Numbers of adult Black-capped Vireos located in Blaine, Caddo and Canadian counties, Oklahoma from 1985 to 1989 and numbers of young produced.

County/ Locality	1985			1986			1987			1988			1989		
	M	F	Yg	M	F	Yg	M	F	Yg	M	F	Yg	M	F	Yg
Blaine/ Salt Creek	3-4	0	0	3	2	4	2-3	2	0?	4	5	2-4	5-6	4	8-10
Canadian/ Caddo Co. line	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Methodist Camp	4	3	10-11	4-5	2	0	3	3	1	2	2	0	0	0	0
Niles	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0
Caddo/ Scott	2	0	0	1-2	1	0	1-2	1	0	2	1	0	2	2	0
TOTALS	12-13	4	10-11	10-12	7	4	6-8	6	1	8	8	2-4	7-8	6	8-10
Total adults	16-17			17-19			12-14			16			13-14		

TABLE 2. Numbers of Black-capped Vireos banded in Blaine, Canadian, and Caddo counties, Oklahoma from 1984 through 1989, and numbers detected in subsequent years.

Locality	Year 1st banded	Number banded and returning ^a																	
		1984		1985		1986		1987		1988		1989							
		M	F	Y	M	F	Y	M	F	Y	M	F	Y						
Salt Creek, Blaine Co.	1986	-	-	-	-	-	2	2	0	0	0	-	-	-	-	-	-		
	1987	-	-	-	-	-	-	-	1	0	0	1	-	-	0	-	-		
	1988	-	-	-	-	-	-	-	-	-	2	2	1	2	2	0	0		
	1989	-	-	-	-	-	-	-	-	-	-	-	-	2	0	0	0		
Methodist Canyon, Canadian Co.	1984	2	1	0	1	0	-	1	-	-	1	-	-	1	-	-	0	-	
	1985	-	-	-	1	1	3	1	1	0	0	0	-	-	-	-	-	-	
	1986	-	-	-	1	1	0	1	1	0	0	0	-	-	-	-	-	-	
	1987	-	-	-	-	-	-	2	2	0	1	0	-	0	-	-	0	-	
Niles, Canadian Co.	1986	-	-	-	2	1	0	0	0	0	-	-	-	-	-	-	-	-	
														[1] ^c	[1] ^c				
Scott, Caddo Co.	1986	-	-	-	1	0	0	0	-	-	-	-	-	-	-	-	-	-	
	1987	-	-	-	0	0	0	1	0	0	1	-	-	1	1	1	1	1	
	1989	-	-	-	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
TOTALS WITH BANDS/YEAR		2	1	0	2	1	3	8	5	0	5	3	0	6	3	1	6	3	0

^a - second and subsequent row values indicate numbers of individuals from preceding row values returning and detected.
^b - M=male; F=female; Y=young.
^c - female banded in 1986, not detected in 1987 or 1988, and discovered in 1989 at the Scott site.

TABLE 3. Numbers of first-year (SY) males, males in at least their second breeding season with significant gray in nape (gray-ASY), and males with solid, or predominantly black napes (black-ASY) given by year. Only males where determinations were made are counted.

Region	year	SY	gray-ASY	black-ASY
Blaine, Caddo and Canadian cos., Oklahoma	1986	-	-	8
	1987	1	-	5
	1988	-	1	6
	1989	2	-	5

TABLE 4. Nesting success and parasitism of Black-capped Vireo nests in Blaine and Caddo counties, Oklahoma during 1989.

County	Total nestings discovered	Nestings with full clutches		successful	Broods discov.	Yg. produced	
		paras./unparas.				Vireo	Cowbird
<u>Without cowbird trapping</u>							
Blaine	7-8 ^a	2	0	3	3	8-10	0
Caddo	2	0	0	0	0	0	0
Subtotal	9-10 ^a	2	0	3	3	8-10	0

^a - one brood may have fledged from one of the nests between visits. See text.

RECEIVED
JAN 29 1990
OKLA. PUB. CLERKHOUSE