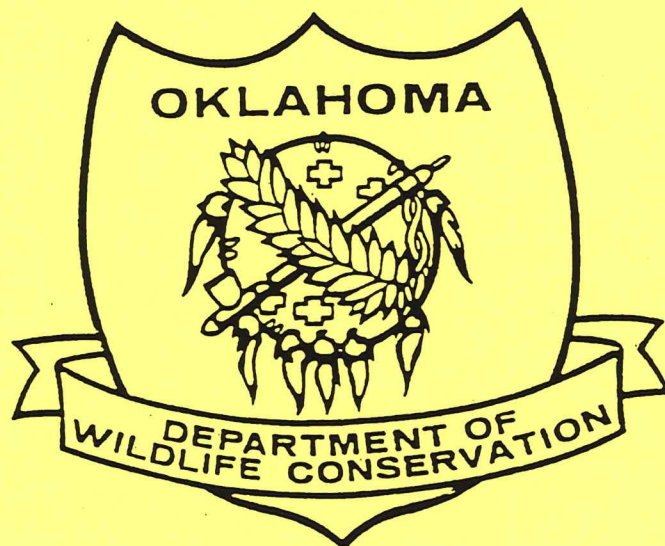


FINAL  
~~PERFORMANCE~~ REPORT

SECTION 6

ENDANGERED SPECIES ACT



FEDERAL AID PROJECT E-45-8

Reproductive Enhancement and Population Monitoring  
of Black-capped Vireos in Blaine County

May 1, 2002 - April 30, 2005

FINAL REPORT

Project E-45-8

May 1, 2002 – April 30, 2005

REPRODUCTIVE ENHANCEMENT AND POPULATION MONITORING OF  
BLACK-CAPPED VIREOS IN BLAINE COUNTY, OKLAHOMA

OKLAHOMA DEPARTMENT OF WILDLIFE  
CONSERVATION

Federal Aid Division  
Oklahoma City, Oklahoma

JULY 2005  
FINAL REPORT

**STATE:** Oklahoma

**PROJECT NUMBER:** E-45-8

**PROJECT TYPE:** Endangered Species Research

**PROJECT TITLE:** Reproductive enhancement and population monitoring of Black-capped Vireos in Blaine County, Oklahoma.

**PROJECT PERIOD:** May 1, 2002 - April 30, 2005

**OBJECTIVES:**

Monitor the number and distribution of Black-capped Vireo territories in the Salt Creek Canyon area of Blaine County, Oklahoma. Initiate and maintain cowbird trapping using proven protocols to reduce brood parasitism of vireo nests and increase seasonal fecundity of vireos.

GRZYBOWSKI, J.A. 2005. Reproductive enhancement and population monitoring of Black-capped Vireos in Blaine County, Oklahoma. Oklahoma Dept. Wildl. Conserv. Final Report, E-45-8.

**ABSTRACT:**

The objectives of this project were to enhance the reproductive success of Black-capped Vireos in Salt Creek Canyon and area, Blaine County, Oklahoma through removal of cowbirds from vireo breeding areas, and removal of cowbird eggs from parasitized nests. The underlying objectives were to maintain this lone northerly outpost of vireos, and increase the number of vireos in the canyon areas. Estimates of the numbers, age structure, reproductive success, and factors influencing reproductive success were made to assess tactics and success. The project period covered the 2002 through 2004 breeding seasons.

During the three nesting seasons covered under this Report, the number of territorial male Black-capped Vireos remained steady at 17 to 19 birds, while the number of female vireos increased from eight to approximately 13 birds. Over the three-year period, the total number of vireo chicks that survived to fledging was between 64 and 74 birds. Annual reproductive success was evaluated by measuring the number of fledglings produced per adult female. Reproductive success varied from a low of 1.75 – 1.88 fledglings per female in 2002 to a high of 1.93 – 2.67 fledglings per female in 2004. In two of the three nesting seasons, reproductive success met or exceeded the 2.0 fledglings/female needed to maintain a stable population.

In 2004, between 29-33 adult vireos, 17-19 males and 12-14 females, were located. This is the highest number of adults yet recorded in this area since the project began. Of 13 males, four were aged as yearlings (31%). Thirteen nests were located; four were parasitized (31%), all abandoned by the vireos. Of the 13 nests observed, 5-6 fledged vireo young and 3-4 were depredated; one was uncertain in that it reached a very late stage, but fledged young could not be confirmed. Three additional broods were first

located when fledged. Thus, the 12-14 females fledged 8-9 broods and 27-32 young, or 1.93-2.67 young per female, most likely (with 13 females) 2.08-2.46 young/female. This is above the minimal target of 1.9-2.0 young per female estimated to maintain the population. The estimates of reproductive success are similar to, but slightly higher than, the previous season, and among the highest yet recorded for this population since effort for conserving this group began.

The methods of enhancing vireo reproductive success include removal of adult cowbirds from the area. Cowbirds were removed through trapping from 18 April through 1 June, 2004. This removal was also supplemented by shooting cowbirds present in the canyons, and vireo territories specifically. In 2004, 98 male cowbirds and 51 female cowbirds were removed from the canyon areas, 83 males and 42 females by trapping, 15 males and 9 females by shooting.

## **INTRODUCTION:**

The Black-capped Vireo (*Vireo atricapillus*) has been designated an endangered species by the U.S. Fish Wildlife Service (USFWS; Ratzlaff, 1987). Populations in Oklahoma have declined substantially in recent times (Grzybowski et al. 1986), and this decline extended over most of the vireo's range in north-central and central Texas (USFWS 1991, Grzybowski 1995). Major factors in the decline are brood parasitism by Brown-headed Cowbirds (*Molothrus ater*) and alteration and loss of the vireo's shrubland habitat through fire suppression and subsequent maturation, various forms of agricultural conversion, and development projects (Grzybowski 1995).

In 1985, an extensive survey of west-central and central Oklahoma disclosed only three areas with Black-capped Vireos, one each in Blaine, Caddo/Canadian, and Comanche counties (Grzybowski et al. 1986). A few pairs were later located at a fourth area near Lake Stanley Draper in Cleveland County (V. Byre, pers. comm.). However, the group in the Caddo Canyonlands has since been extirpated, persisting only into the early 1990's (Grzybowski 1992). Thus, the areas where Black-capped Vireos are known to occur in the past few years are: (1) the Wichita Mountains Wildlife Refuge and portions of the adjacent Fort Sill Military Reservation, Comanche County; (2) canyons of Blaine County, primarily the Salt Creek area; and (3) cross-timbers scrub near Lake Stanley Draper in Cleveland County. The largest number of vireos occurs in the Wichita Mountains. The few pairs that have persisted in recent times at the Lake Stanley Draper site may soon disappear or may no longer be present (J. Shackford, pers. comm.). The Salt Creek Canyon area is the northernmost breeding location for Black-capped Vireos in their entire current range, and may already be the only other site away from the Wichita Mountains where Black-capped Vireos occur in Oklahoma.

The canyonlands of Blaine County were the location where Bunker (1910) first discovered the vireos in Oklahoma, collecting 48 vireos from 1901 to 1903, and locating many nests. His original descriptions of the deep canyon terrain closely match that for the upper reaches of Salt Creek. Vireos were next noted in Blaine County during 1955 when Jean Graber conducted her landmark study on the species (Graber 1957), although she did not make observations in the Salt Creek area. Vireos have been recorded in the

cross-timbers above the escarpment, and were believed locally common in Blaine and eastern Dewey counties in the 1950's and 1960's (Graber 1961; Grzybowski et al. 1986). In 1963, Joel Cracraft collected a pair 6 mi. S and 6 mi. W of Okeene, Oklahoma, placing his birds at or near Salt Creek Canyon.

This group of birds in Blaine County has been monitored here since the mid-1980's when only about four pairs were known to be present (Grzybowski 1992, 2002, Jones 1995). This work began under the auspices of the Nongame Program of the Oklahoma Department of Wildlife Conservation and ESA Section 6 funding from Region 2 of the USFWS. In 1990, the Oklahoma Chapter of The Nature Conservancy, in conjunction with the Oklahoma Department of Wildlife Conservation, and the Ecological Services office of the USFWS in Tulsa, initiated a recovery effort for the Blaine County Black-capped Vireo population. Under the current project, cowbird control in the vireo's canyon nesting areas has been implemented to enhance vireo reproductive success. Recent efforts by the USFWS and Nature Conservancy have partnered to include forms of habitat management and restoration making this a joint interagency effort. The work reported herein for 2004 is a continuation of this joint population monitoring and management effort, covering here cowbird control and population monitoring.

## **METHODS:**

The objectives for this segment of the project were to enhance reproductive success of Black-capped Vireos in the Salt Creek Canyon area through removal of cowbirds from the area, and removal of cowbird eggs from parasitized nests, and to obtain estimates of the numbers, age structure, reproductive success, and factors effecting reproductive to monitor and assess the success of this effort. The focal area for the work included the canyons at the upper reaches of Salt Creek, and a collection of draws and canyons just to the south, including, most notably, portions of Ruby Mills Canyon. The search zones included all areas where vireos had been observed since 1985 as well as any intervening scrubby habitat, and most adjacent canyons.

## **Description of Study Area:**

A site description for Salt Creek Canyon and area is given in Jones (1995). Essentially, the areas include a series of eroded canyons of up to 65 m in contour change. Several strata of gypsum occur in the canyon walls and near the tops. As these are undercut by erosion, significant parts have broken off and slid down the steep slopes clearing swathes of vegetation. Although this natural clearing can result in the vegetation returning to scrubby deciduous forms suitable for vireos, much of the area is still overgrown primarily with stands of mature junipers (*Juniperus virginianus*). The primary deciduous woody species in these canyons are eastern redbud (*Cercis canadensis*), roughleaf dogwood (*Cornus drummondii*), chittamwood (*Bumelia lanuginosa*), hackberry (*Celtis* sp.), and American elm (*Ulmus americana*). While oaks of scrubby stature are frequently an important component of vireo habitat (Grzybowski et al. 1994), only a few small pockets containing oak occur in the canyons, these being of burr oak (*Quercus macrocarpa*) and shin oak (*Q. harvardi*)—species uncommon in the area at large.

### **Collection of Field Data:**

A general survey of the Salt Creek Canyon areas was conducted from early to late May by the principal investigator. Areas were systematically searched primarily on foot in a manner that allowed the observer to be within hearing of most potential sites for at least 20 minutes. The range of suitable detection was generally considered to be 100-150 meters line-of-sight, although some birds have been detected as far away as 0.45 miles.

Although almost all vireos were initially detected by their vocalizations without any stimulation, recordings of vireo songs were used at most locations where no vireos were noted in attempts to elicit responses from potentially silent birds. Overall, the recordings were used judiciously, with no more than a few phrases given in a burst, and for fewer than six bursts in any one area, most frequently fewer than four. As birds were located, efforts were made to separate other potential males by positioning the observer(s) so that they could follow a male's movements, or simultaneously hear separate males. Plumage characteristics of the cap, and the presence of leg bands also were recorded. The birds so located provided a count representing an estimate of the population in the Salt Creek Canyon area.

All birds found were monitored at intervals through the remainder of the nesting season, a period that extended from mid-May to early August. Monitoring involved the determination of potential age, mated status, and the reproductive status during each visit. The latter was accomplished by locating nests or young. Cowbird eggs and chicks were generally removed from active nests when found (if nest in or potentially in an advanced stage, or return by observer was not likely before the cowbird egg or chick would further impact vireo reproductive success), or on a subsequent visit.

### **Cowbird Removal**

Cowbird decoy traps were used. These are basically aviaries about 12' X 8' X 6' with a funnel-shaped entrance at the top. Live cowbird decoys are placed in the trap, usually 3-4 males, and two females with food and water sources. The flocking tendencies of cowbirds, along with food (usually sunflower seeds), attract cowbirds into the trap through the funnel. Four decoy traps were operated. These were placed at four locations; two near the main canyons, and two above smaller canyons just to the south.

Cowbirds also were collected in the canyon areas with vireos through shooting. This process was enhanced with tape recordings of the male cowbird song, and female rattle calls. The canyon areas were systematically walked several times during the early part of the vireo nesting season.

### **RESULTS:**

Surveys and monitoring revealed 17-19 adult male and 12-14 adult female Black-capped Vireos in Blaine County during 2004 (Figure 1). Seven territories were in the main Salt Creek Canyon. The remainder were scattered in smaller canyons and draws to the south. The last two males were detected late in the season, and may have been previously detected males undergoing post-season dispersal or wandering. At least three of the original 17 males were not accounted for during late-season monitoring (past

1 July). The number of male vireos in 2004 was similar to that observed in 2002 and 2003 (17-18 in both years). The number of female vireos increased over time from a low of 8 in 2002 to 12-14 in 2004.

The female to male ratio in 2004 was 0.72 (13 of 18) and was a substantial increase over the ratio of 0.44 (8 of 18) in 2002. Of the 17 males located early in the 2004 season, at least 15 had reproductive opportunities at some time during the breeding season. Two males apparently lost females from early-season matings. Non-overlap in detected nestings suggested that both females in these cases could simply have moved to another nearby male. At least one male clearly assessed as unmated in May was mated and with active nests later in the season. Other mate swapping also may have occurred.

The number of females is a critical parameter for a population. Almost invariably, there are more male vireos than females in any population. Because females are not as readily detected as males, their numbers can be underestimated. Mid-season monitoring could clearly account for at least 12 females simultaneously, with an additional two likely, but not verified, from male behavior. In late season, when some females wander off territory and may be most difficult to detect, monitoring still simultaneously accounted for 11 females, including several floaters intruding into territories with active pairs. Thus, the actual number of female vireos present during 2004 may have been 13 or 14.

In 2004, four of 13 males (31%) were assessed as yearlings by their gray napes. The latter represents a value at or near replacement for adult mortality (probability of adult male survivorship is about 0.68; see Grzybowski 1995). Two previously color-banded males were located, one now in his tenth year and the second banded in 2000 (born at least two-years prior), now in at least his 6th year.

Thirteen vireo nests were located during the season. Of these 4 were parasitized and abandoned, 5-6 were successful, and 3-4 were depredated. The outcome of one nest was uncertain (successful or depredated), thus it was placed in both categories. The amount of feather dander in this nest (from pin feathers breaking their sheaths, thus creating the dander) suggested that the young made it at least to near fledging and there were no signs of depredation. Fledged young could not be located in this territory, however the male was not present during the last visit, and may have moved far off territory with the young.

Of the thirteen nests found, two were first discovered during nest-building, one during egg-laying, four during incubation, three with nestlings, and three already abandoned, two of these latter with cowbird eggs. Three of the 8-9 broods were located already fledged. Clearly, other nests not located were depredated as well and others not discovered could have been parasitized and abandoned.

The 12-14 females fledged 8-9 broods of 27-32 vireo young. One female fledged two of these broods. Seasonal fecundity was between 1.93-2.67 young per female, most likely (with 13 females) 2.08-2.46 young/female. This is at or above the minimal target of 2.0 young per female estimated to maintain the population. The 12-14

females noted this season was higher than the 8 noted in 2002, and at least ties the highest number of female vireos noted in the canyons since the late 1980's (11-12 in 1995; see Grzybowski 2002). A three-year summary of the numbers of adult vireos, fledglings and reproductive success is presented in Table 1.

### **Cowbird Removal**

Cowbird traps were operated from 18 April through early June 2004 and removed 83 male and 42 female cowbirds. These traps were generally more successful this season than in previous years (6 cowbirds in 2002 and 53 cowbirds in 2003). An additional 15 male and 9 female cowbirds were collected directly from the canyons from late April to late May 2004, which is comparable to the 12 males and 9 females collected in 2002 and the 20 males and 15 females collected in 2003. Trapping and shooting removed a total of 98 males and 51 females in 2004.

Although removing cowbird eggs from parasitized nests can enhance reproductive success, all four parasitized nests located this season were abandoned. Nonetheless, because some nests from which cowbird eggs were removed were successful in fledging vireos, cowbird removals and nest checks remain an integral part of enhancing reproductive success for these Blaine County vireos.

Support for this effort by the Oklahoma Department of Wildlife Conservation has been terminated for the upcoming season. However, interest and investments in management efforts and land conservation strategies to maintain vireos in Blaine County by the U.S. Fish and Wildlife Service and Oklahoma Nature Conservancy continues. Thus, interest in cowbird removal for 2005 continued and was conducted during the duration of the funded period in 2005. The coordinated efforts of principal investigator and agency representatives removed 33 male and 38 female cowbirds from the canyon areas during April (and May) 2005, hoping to benefit reproductive success of vireos in the canyonlands during 2005.

### **Landowner coordination**

Because the Blaine County vireos occur on private lands, landowner cooperation is a critical component of the success of this project. Contacts with landowners were made throughout each season, with the Oklahoma Nature Conservancy managing much of this effort.

Landowner support has been good in the canyon properties. However, in 2004, an unfortunate incident occurred in traveling across one of the properties above the canyons. The investigator inadvertently interfered with some turkey hunters, leading to complaints directed to and through the ODWC. While, this was the first incident of this type in the long project duration, it may have influenced the termination of support by the Oklahoma Department of Wildlife Conservation. Other landowners were discouraged by this withdrawal of support for this effort as were other agencies (USFWS and the Oklahoma Nature Conservancy) supporting other dimensions of this recovery effort.



## **RECOMMENDATIONS:**

1.) Landowner contact and monitoring of vireos should continue in the Salt Creek Canyon area and be coordinated with the current habitat management and restoration efforts of the U.S. Fish and Wildlife Service and The Nature Conservancy.

2.) The Oklahoma Department of Wildlife Conservation should continue to coordinate with other agencies in what has been a partnership of effort to maintain, increase and manage vireo populations in this Blaine County group. In this regard, it should reconsider its support for this project, and minimally make such a decision in consultation with other partners.

3.) Decision-making criteria should be established for continuing or withdrawing from this effort. These decision criteria should also draw input and recommendations from the Black-capped Vireo Recovery Team. The Blaine County population has improved in numbers, but slowly and tenuously. It is currently at one of its peaks with 12-14 females. An earlier shuffling of effort right at its previous peak in the mid-1990's coincided with a decline to 7-8 pairs. This group currently maintains interest for support by the U.S. Fish and Wildlife Service and Oklahoma Nature Conservancy in being the northernmost group of vireos in the entire range, and in being what is or will become the only other group of vireos in Oklahoma outside the Wichita Mountains.

4.) The basic need to increase reproductive success of the vireos to greater than 2.00 young/female is still evident. Cowbird trapping is an obvious recommendation as it will decrease the number of eggs female vireos have to lay and increase the number of young they produce. Removal of cowbirds directly from the canyons by shooting near arrival times of vireos may both target cowbirds actually affecting vireos and enhance success of early vireo nesting efforts.

5.) A broader effort at removing cowbirds from their local feeding sites, proved more effective in other areas, needs to be coordinated with landowners. U.S. Fish and Wildlife Service is currently developing support for such effort, and this needs to be developed.

6.) Removal of cowbird eggs from active nests allowed success in several other seasons; this strategy should continue to be used to enhance vireo reproductive success.

7.) The current efforts of juniper removal by the Oklahoma Nature Conservancy has enhanced vireo habitat in the canyons and needs to be continued. Vireos have occupied such cut areas and incorporated them into their territories as quickly as the next season.

## **ACKNOWLEDGMENTS:**

Financial support for this study was received from the Wildlife Diversity Program of the Oklahoma Department of Wildlife Conservation with funds from Section 6 of the Endangered Species Act.

Grateful acknowledgment is given to the landowners in the Salt Creek Canyon area who allowed access for monitoring and management. They are Douglas and Alice

Boeckman, Jay Hoffman, Jess Kephardt, Brenda Wray Rhodes, Elmer Robison, James and Norma Scott, U.S. Gypsum Company, Viersen Land and Royalty Company, and Ebbie Wray. Cooperation from several lessees was also most beneficial; these individuals included Wes McCrary and Tony Simmons.

This study was a joint cooperative venture from several conservation groups and natural resource agencies including The Oklahoma Nature Conservancy, the Ecological Services Office of the USFWS in Tulsa, and the Wichita Mountains Wildlife Refuge. Instrumental in this support were Mark Howery, Joe Kimball, Kevin Stubbs, Sam Waldstein, and Chris Hise. The Wichita Mountains Wildlife Refuge has also allowed continued use of a mobile cowbird trap, and a number of initial decoy cowbirds; Sam Waldstein, Joe Kimball and Chip Kimball were supportive and instrumental in this process. In addition, Kevin Stubbs and Chris Hise assisted in operating the cowbird traps and in collecting cowbirds directly from the canyons.

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## LITERATURE CITED:

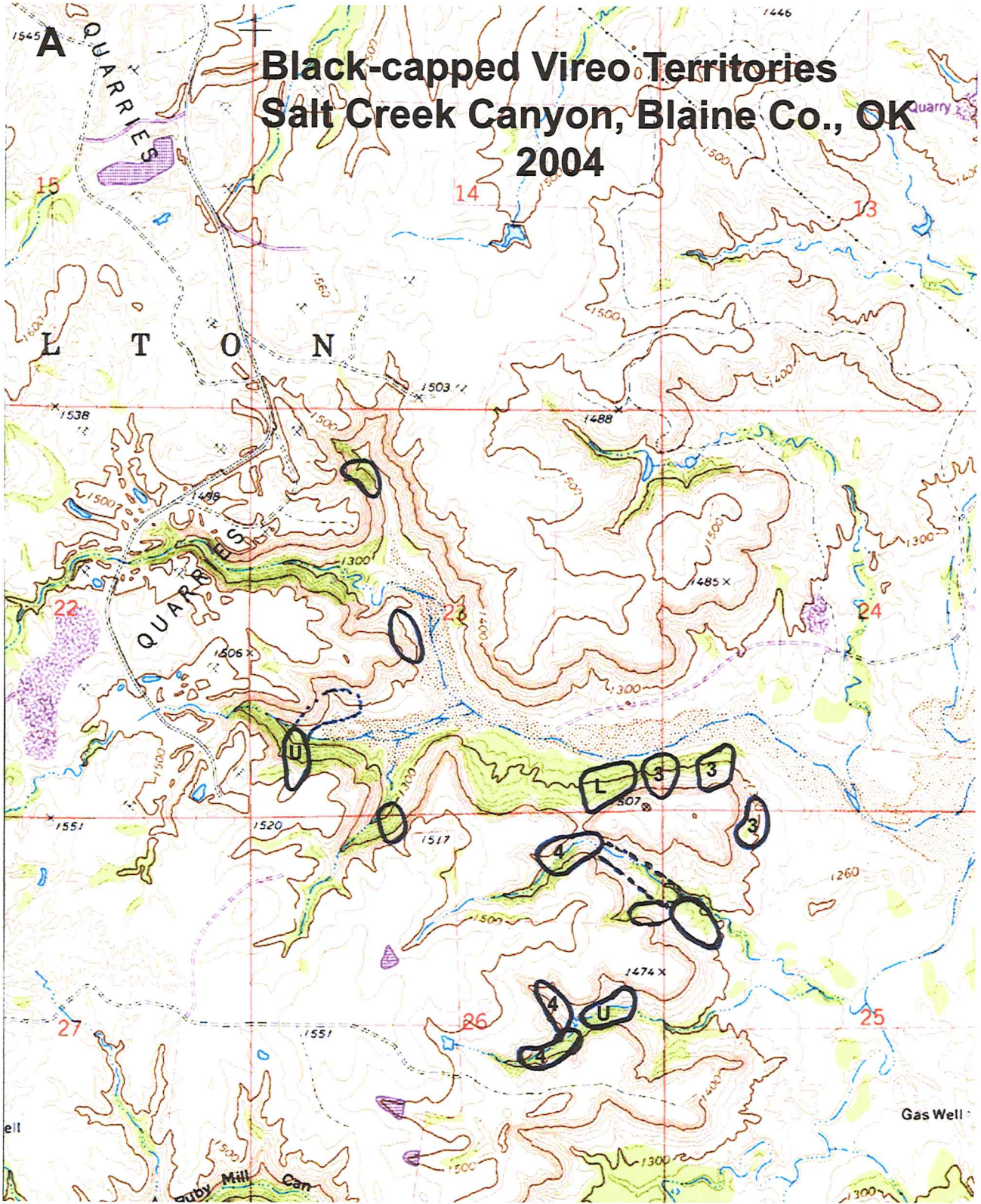
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**Table 1. Summary of Blaine County Black-capped Vireo (BCV) Recovery Effort, 2002 – 2004 Nesting Seasons**

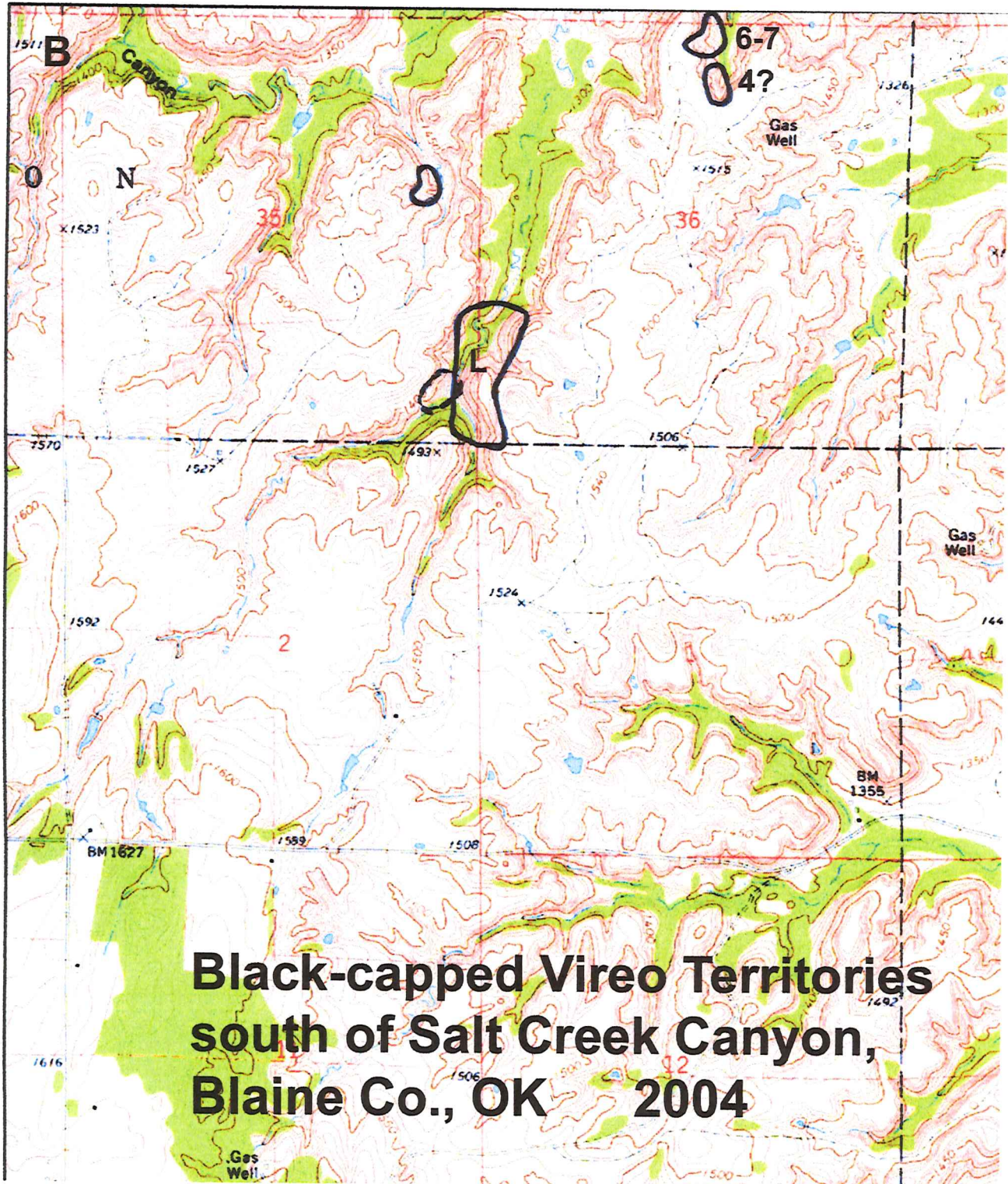
	Nesting Season		
	2002	2003	2004
Number of BCV Males	18	17-18	17-19
Number of BCV Females	8	12-13	12-14
Number of BCVs Fledged	14-15	23-27	27-32
Number of Fledglings/Female	1.75-1.88	1.77-2.25	1.93-2.67
Number of Cowbirds Removed	17 males 10 females	64 male 24 females	98 males 51 females

**Figure.** Locations of Black-capped Vireo territories (circled areas) in the Salt Creek Canyon area of Blaine County, Oklahoma during 2004. [A.] Main Salt Creek Canyon area. [B.] canyons to the south. Numbers indicate the number of young fledged in each territory. For one case, where fledging was uncertain, number is followed by a question mark (?). U indicates an unmated male, L designates a male that lost his early season mate. Two territories show extended temporary use areas in dashed lines. Two small territories enclosed by dashed lines indicate where males were detected late in the season only.

# Black-capped Vireo Territories Salt Creek Canyon, Blaine Co., OK 2004







Boeckman, Jay Hoffman, Jess Kephardt, Brenda Wray Rhodes, Elmer Robison, James and Norma Scott, U.S. Gypsum Company, Viersen Land and Royalty Company, and Ebbie Wray. Cooperation from several lessees was also most beneficial; these individuals included Wes McCrary and Tony Simmons.

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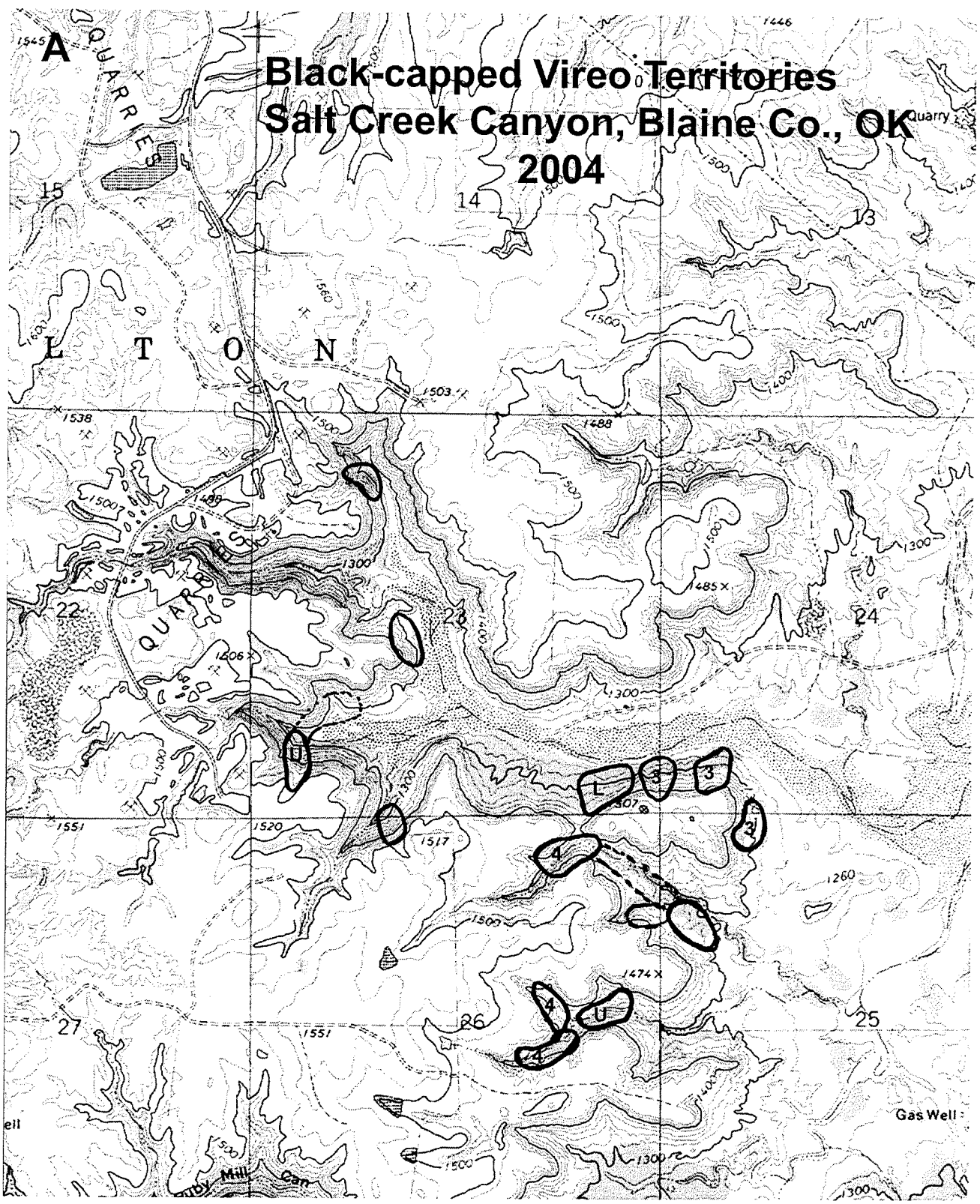


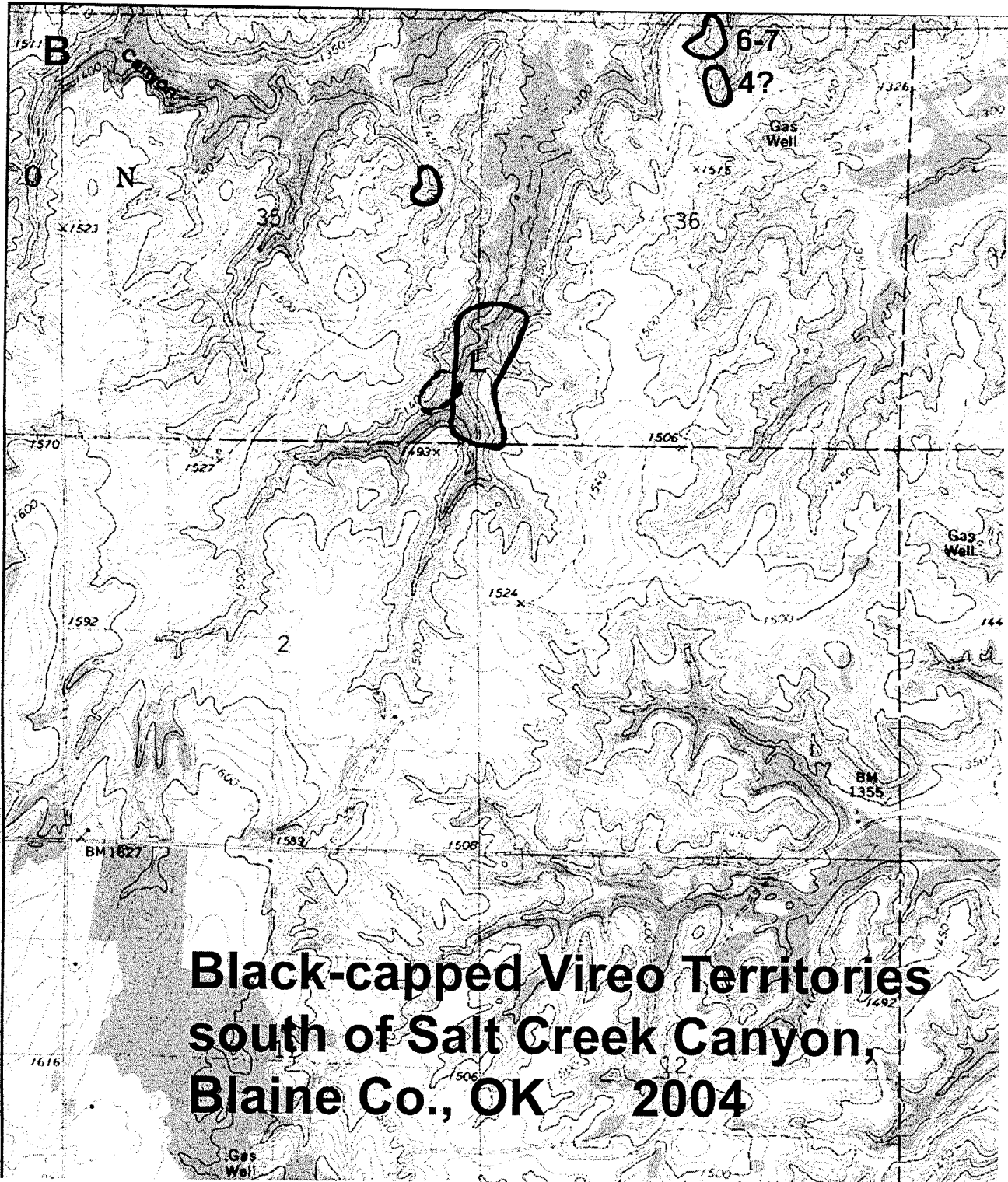
**Figure 1.** Locations of Black-capped Vireo territories (circled areas) in the Salt Creek Canyon area of Blaine County, Oklahoma during 2004. [A.] Main Salt Creek Canyon area. [B.] canyons to the south. Numbers indicate the number of young fledged in each territory. For one case, where fledging was uncertain, number is followed by a question mark (?). U indicates an unmated male, L designates a male that lost his early season mate. Two territories show extended temporary use areas in dashed lines. Two small territories enclosed by dashed lines indicate where males were detected late in the season only.

# Black-capped Vireo Territories

## Salt Creek Canyon, Blaine Co., OK

2004





**Black-capped Vireo Territories  
south of Salt Creek Canyon,  
Blaine Co., OK 2004**