

2006 GRAY VIREO MONITORING IN SOUTHEAST NEW MEXICO



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EXECUTIVE SUMMARY

The Gray Vireo (*Vireo vicinior*) is a scrub-foraging songbird of national and regional conservation concern, primarily because of perceived threats, such as habitat loss and Brown-headed Cowbird (*Molothrus ater*) parasitism. Despite concern over Gray Vireo populations, few studies have measured reproductive success and determined temporal trends for local populations. In 2005, Hawks Aloft, Inc., located 15 Gray Vireo territories and monitored 19 nests in the Lincoln National Forest, Guadalupe Ranger District, near the town of Queen, New Mexico. With funding support from the USDA Forest Service, we returned to the site to document any changes in the number of territories and determine if the high parasitism and low productivity observed in 2005 continued into 2006. We located 17 territories in 2006, but we were only able to locate four active nests, precluding an updated evaluation of nest parasitism and productivity. Although forest closure during much of the field season resulted in a reduced monitoring effort, drought conditions also might have limited Gray Vireo nesting activity, thereby affecting our ability to find nests. We recommend continued monitoring of territory numbers, levels of nest parasitism, and productivity to further evaluate the viability of this population. Information on the viability of Gray Vireo populations, like this one, will help land managers prioritize conservation efforts and improve future status assessments for Gray Vireos in New Mexico.

INTRODUCTION

The Gray Vireo (*Vireo vicinior*) inhabits scrub vegetation in open pinyon-juniper woodland regions of the southwest United States and Mexico (Barlow et al. 1999). Much of its breeding habitat occurs in remote areas with hot, arid climate. They are nondescript in plumage and vocally similar to the more widespread Plumbeous Vireo (*Vireo plumbeus*), factors complicating identification for many observers. The challenges of accessing remote habitat and identifying birds in inhospitable terrain perhaps have limited the amount of research on Gray Vireo distribution and breeding biology (Barlow et al. 1999).

Although research is limited, the Gray Vireo is a species of growing conservation concern. The U.S. Fish and Wildlife Service (2002) listed Gray Vireo as a species of national conservation concern. Like the federally endangered Black-capped Vireo (*Vireo atricapillas*), the Gray Vireo has limited breeding and wintering ranges, prompting concerns over habitat availability. Researchers have recorded especially high rates of Brown-headed Cowbird (*Molothrus ater*) parasitism at nests for some vireo species (e.g., Black-capped Vireo, Eckrich et al. 1999), prompting concerns that cowbird parasitism might also affect Gray Vireos. Cowbird parasitism of Gray Vireo nests has been found in some regions (Hanna 1944, Barlow et al. 1999), but there is little information on levels of parasitism and its effect on local populations (Barlow et al. 1999).

The New Mexico Department of Game and Fish (NMDGF) (2004) consider Gray Vireo to be a state threatened species, citing habitat alteration and cowbird parasitism as threats. In New Mexico, potential pinyon-juniper habitat is widespread, but junipers (*Juniperus* spp.) are extensively cleared for perceived benefits, such as increased forage

production and watershed restoration (Clary and Jameson 1981, Roundy and Vernon 1999). In addition to juniper clearing, many pinyons (*Pinus edulis*) in New Mexico have been destroyed by bark beetle infestation, further threatening pinyon-juniper woodlands in the state. It is unknown to what extent the alteration of pinyon-juniper habitat, or nest parasitism, threatens Gray Vireos in New Mexico.

To clarify the status of Gray Vireos in New Mexico, more intensive population studies are needed. Researchers have identified numerous Gray Vireo populations in New Mexico (e.g., New Mexico Ornithological Society 1995, Reeves 1999, NMDGF 2004), thereby improving our knowledge of distribution; however, few studies have measured reproductive success and determined temporal trends for local populations. In 2005, the New Mexico Department of Game and Fish provided funds for Hawks Aloft to locate Gray Vireos and monitor territories in the Guadalupe Mountains of southeast New Mexico. We located 15 territories along the eastern edge of the Lincoln National Forest and found considerable nest parasitism and low productivity. With funding support from the USDA Forest Service, we returned to the site to document any changes in the number of territories and determine if high parasitism and low productivity continued into 2006. Information on local populations will help land managers prioritize conservation efforts and improve future status assessments for Gray Vireos in New Mexico.

STUDY AREA

We conducted the study on USDA Forest Service land in the Guadalupe Ranger District of the Lincoln National Forest, in western Eddy County, New Mexico. We located and monitored Gray Vireo territories in the same two sites as in 2005: Red Bluff

and Queen (Fig. 1). The Red Bluff site was located approximately 10 km north of Queen, New Mexico. The site included several shallow draws along route S277 near the east boundary of the National Forest. The Queen site was located approximately 10 km east of Queen along Highway 137, also near the east boundary of the National Forest but 12 km southeast of Red Bluff. Gray Vireo habitat at Queen was situated on the north and south sides of the highway, but most of the habitat occurred in canyons adjacent to Thayer Hill. Habitat at both sites consisted of oak (*Quercus* spp.) and juniper scrub in patches, with scattered pinyons. Vireos at the Queen site were distributed along rocky canyon slopes, whereas the terrain at Red Bluff was relatively flat. Elevation at both sites was 1,500-1,700 m. Suitable habitat for Gray Vireos in the eastern foothills of the Guadalupe Mountains likely follows this elevation zone between the two sites and extends northwest from Red Bluff. We found that lower elevations (i.e., to the east) contained fewer pinyons and generally sparse vegetation; higher elevations (i.e., to the west) contained high-density pinyon-juniper woodland with reduced scrub oak.

METHODS

We searched for Gray Vireo territories at Red Bluff and Queen during the final week of April using two observers. The timing of our 2006 search effort was similar to 2005; however, our use of two observers instead of one during that week allowed more thorough coverage than in 2005. We located Gray Vireos by listening for vocalizations while walking slowly through appropriate habitat. We paused for 30 min or more in areas where territories were monitored in 2005. Upon initial discovery of a vireo, usually a singing male, we recorded Universal Transverse Mercator (UTM) coordinates (Zone 13,

North American Datum 27). We then passively followed singing males to ascertain general territory boundaries and apparent centers of activity. We assigned a territory number and revisited the territories periodically to determine pair status and nesting activity. We provide location coordinates and pair status for all territories in Appendix 1 and a list of all avian species encountered during monitoring in Appendix 2.

We monitored territories as often as possible (usually once per two weeks) from the start of May through mid-July. Because of severe drought conditions, the forest was closed to all public access from May through June. Therefore, we coordinated monitoring visits through the USDA Forest Service, who kindly allowed access provided that we obtain a permit from the Guadalupe Ranger District office before each visit. The process of gaining access resulted in the following changes in our monitoring schedule, relative to 2005: our first visit in May was cancelled, visits were not conducted during weekends, and we did not attempt to access the Red Bluff territories. Because the Red Bluff territories were remote, far from paved roads, and relatively few in number, we did not pursue admission to this area, given the substantial concern for fire.

We observed the behavior of vireos to ascertain pair status and locate nests. Although we did not mark birds with identifying leg bands, the spacing of territories and nests, along with observations of territorial disputes, made us fairly certain that we were monitoring the same individuals on consecutive visits. We considered a male vireo to be paired if we observed a female during any visit or evidence of nesting in the territory (e.g., an active nest or fledged young). Female vireos were often easily found when singing males traveled with them prior to nest building. Nests were located by watching male or female vireos deliver nesting material or approach the nest to incubate. Male

vireos sometimes sang near or on the nest, further assisting our efforts to find nests. Upon locating nests, we examined the contents and recorded UTM coordinates. We chose not to flag nest locations, relying instead on the coordinates to relocate nests. We provide photographs of several Gray Vireo nest sites in Appendix 3. We report nest parasitism as the percentage of nests containing at least one cowbird egg or nestling at any time while the nest was active. For nests monitored to completion, we determined the fate as either failed or fledged. For fledged nests, we report the number of vireo or cowbird young observed to fledge.

RESULTS

We located 17 Gray Vireo territories in 2006, 14 at Queen and 3 at Red Bluff. Females were observed in 10 of the 17 territories; we consider pair status to be unknown for the remaining territories where females were not observed (three at Red Bluff and four at Queen). We located four active Gray Vireo nests in 2006, considerably fewer than the 19 nests we located in 2005. We monitored two of the nests to completion. One nest fledged three vireo young on 21 June, and the other was abandoned in the building stage. Of the active nests not monitored to completion, one had three vireo eggs on 20 June, and the other was in the late building stage on 19 July. In addition to the four active nests, we located an inactive nest that appeared to be freshly depredated on 21 June. The pair in this territory foraged together in the area for about 30 minutes, perhaps indicating that another nest was not currently active. Of the two nests observed with eggs or young, none were parasitized. Aside from the three vireos fledged from a monitored nest, we did not observe any fledglings.

DISCUSSION

The high parasitism and low productivity observed for Gray Vireos in 2005 did not have an obvious effect on the number of Gray Vireo territories found in 2006. Some spatial shifts in territories were observed in 2006, but locations were fairly consistent between years. If territory numbers remain stable in future years, despite continued low productivity, this population could be considered a sink requiring the immigration of birds from a source population to maintain itself. Future monitoring would be required to determine if conditions of a sink population are met.

We located substantially fewer nests in 2006. Although a reduced monitoring effort in 2006 probably explains at least some of the decline, there are reasons to consider that unusually dry conditions in southeast New Mexico might have limited the number of nesting attempts. During our first visit in 2005 (25-29 April), we found five Gray Vireo nests in the building stage, whereas we found none during our first visit in 2006 (23-27 April). This decrease in observed nesting behavior, despite an extra observer, indicates that the Gray Vireo nesting season started relatively later in 2006 than in 2005. During a visit in the third week in June, we observed males and females foraging or traveling together in most of the territories visited. Observations of a pair traveling through a territory for an extended period of time are perhaps indications that there are no active nests in the territory at that time. Also, we did not observe adult vireos feeding fledglings in territories visited late in the season, further indication that nesting activity might have been somewhat reduced in 2006.

Because we had a limited sample of monitored nests, we could not determine if the high parasitism and low productivity observed in 2005 persisted in 2006. Our

discovery that 71% of nests were parasitized in 2005 demonstrated how cowbirds could negatively affect this population of Gray Vireos. Our observation of no parasitism at two eligible nests in 2006 neither supports nor greatly counters our 2005 conclusion. If Gray Vireos attempted fewer nests in 2006, as we suggest, and the timing of nesting activity was less predictable, Brown-headed Cowbirds might have been less successful in locating nests. Future monitoring could determine if the threat of cowbird parasitism persists over multiple seasons or if 2005 results were unusual. A wetter winter in 2006-2007 could provide better nesting conditions for Gray Vireos in 2007, as well as alleviate access regulations associated with fire concerns. We recommend continued monitoring of territory numbers, levels of nest parasitism, and productivity to further evaluate the viability of this population. Information on the viability of Gray Vireo populations, like this one, will help land managers prioritize conservation efforts and improve future status assessments for Gray Vireos in New Mexico.

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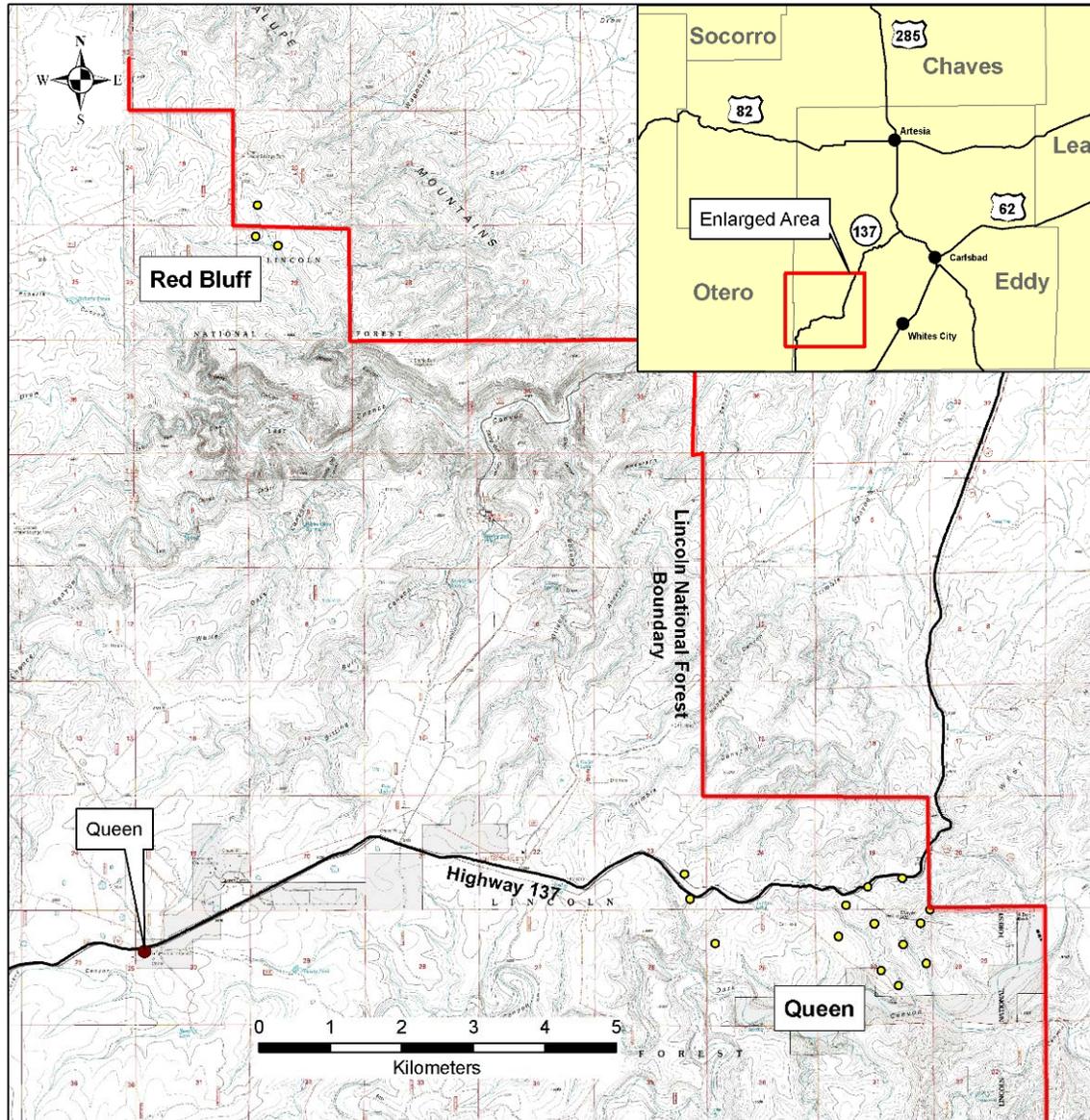


Figure 1. Gray Vireo territories located in 2006 on the Queen and Red Bluff, New Mexico USGS Quadrangle Maps. Territories are indicated by yellow dots.

Appendix 1. Universal Transverse Mercator coordinates (North American Datum 27) of Gray Vireo territories found in southeast New Mexico in 2006.

Territory	Date Found	Site	Easting	Northing	Paired?
1	4/25/06	Queen	534439	3562397	Yes
2	4/25/06	Queen	534142	3561105	Yes
3	4/25/06	Queen	534385	3560893	Yes
4	4/25/06	Queen	533653	3562021	Unknown
5	4/26/06	Red Bluff	525387	3571417	Unknown
6	4/26/06	Red Bluff	525414	3571851	Unknown
7	4/26/06	Red Bluff	525695	3571280	Unknown
8	4/26/06	Queen	534831	3561958	Unknown
9	4/26/06	Queen	534695	3561771	Yes
10	4/26/06	Queen	533960	3562274	Yes
11	4/27/06	Queen	531818	3561482	Unknown
12	4/27/06	Queen	531392	3562452	Yes
13	4/27/06	Queen	531467	3562109	Unknown
14	4/27/06	Queen	533549	3561582	Yes
15	4/27/06	Queen	534046	3561762	Yes
16	4/27/06	Queen	534453	3561470	Yes
17	4/27/06	Queen	534779	3561206	Yes

Appendix 2. List of 56 bird species observed during Gray Vireo searches or territory monitoring in southeast New Mexico in 2006.

Turkey Vulture	Cactus Wren
Cooper's Hawk	Ruby-crowned Kinglet
Sharp-shinned Hawk	Bushtit
Red-tailed Hawk	Juniper Titmouse
Great Horned Owl	Plumbeous Vireo
Scaled Quail	Gray Vireo
Mourning Dove	Yellow-rumped Warbler
White-winged Dove	MacGillivray's Warbler
Greater Roadrunner	Virginia's Warbler
Common Nighthawk	Wilson's Warbler
Common Poorwill	Hepatic Tanager
Ladder-backed Woodpecker	Summer Tanager
Broad-tailed Hummingbird	Brown-headed Cowbird
White-throated Swift	Scott's Oriole
Cliff Swallow	Rufous-crowned Sparrow
Violet-green Swallow	Brewer's Sparrow
Cassin's Kingbird	Vesper Sparrow
Olive-sided Flycatcher	Black-chinned Sparrow
Ash-throated Flycatcher	Black-throated Sparrow
Gray Flycatcher	Chipping Sparrow
Townsend's Solitaire	White-crowned Sparrow
Hermit Thrush	White-throated Sparrow
Northern Mockingbird	Lark Sparrow
Western Scrub-Jay	House Finch
Common Raven	Black-headed Grosbeak
Bewick's Wren	Green-tailed Towhee
Rock Wren	Spotted Towhee
Canyon Wren	Canyon Towhee

Appendix 3. Photographs of Gray Vireo nest sites in the Lincoln National Forest, New Mexico in 2006.



Territory 3 pair fledged three from a nest 7.5 feet high in this juniper (534437-3560937).



Territory 12 pair built a nest 5 feet high in this juniper on 19 July (531392-3562401).



This juniper in Territory 17 contained a nest with 3 eggs on 20 June (534795-3561082).