

**Survey of Black-capped Vireo,
Big Bend National Park, Brewster County, Texas
Spring 2004**



John Maresh
Environmental Defense
Austin, Texas



ENVIRONMENTAL DEFENSE

finding the ways that work

September 2004

Introduction

Between 28 May and 3 June 2004, we surveyed sites in Big Bend National Park, Brewster County, Texas (BBNP) for Black-capped Vireo (*Vireo atricapilla*; BCV). The Black-capped Vireo was listed as Endangered under the Endangered Species Act by the U.S. Fish and Wildlife Service (FWS) in 1987 and by the Texas Parks & Wildlife Department (TPW) that same year (USFWS 1991; TPW 1999). The census was conducted as Study # BIBE-00083 for the National Park Service (NPS) in accordance with Resource Activity Permit # BIBE-2004-SCI-0042 and was partially funded by a grant from the Friends of Big Bend National Park. Additional funding was provided by the FWS' Endangered Species Program as part of a Section 6 grant: **Project WER61: Census and Monitoring of Black-capped Vireo in Texas**. This effort was the eighteenth annual census for BCV since 1986 (Maresh 2003).

Objectives

As in previous years, the purpose of the 2004 census was to: 1) determine current population size within the park, 2) monitor nesting activity, and 3) document cowbird (*Molothrus* spp.) parasitism and other threats (Maresh 2003).

Survey Methods

Survey sites were selected from descriptions and mapped locations of areas used by BCV in previous years (Peck and Barlow 1998, 2000; Maresh 2003). Additional sites were surveyed to investigate BCV observations reported by park staff (M. Flippo pers. comm.). Locations of areas surveyed are indicated in Figure 1. Areas of appropriate habitat were surveyed by listening and watching for the target species. Most often, male BCV are heard before they are seen. When an individual was heard, an effort was made to make visual contact with the bird to establish age and banding status. If possible, the bird was observed over an extended period to try to determine the extent of the area it was using. This use area was mapped as accurately as possible on USGS 7.5" topographic maps. Observations of nests, females and fledglings were noted for each territory (Maresh and Hernandez 1999).

Black-capped Vireo nests are most easily located by using behavioral clues presented by the birds (carrying of nesting material or food, nest exchanges, shradding, etc.). When nests were located, notes on the condition, location, contents and GPS coordinates were recorded.

Nest and territory data were transferred from the topographic maps to Texas Orthoimagery Program Digital Ortho Quarter Quads (DOQQs) and Digital Raster Graphics (DRGs) using Environmental Systems Research Institute (ESRI) ArcView® GIS.

During all observations, care was taken not to disturb the birds' normal activities. Playback of taped BCV song was generally used sparingly and only after an initial determination of the absence of the birds.

As in previous years (Peck and Barlow 2000; Maresh 2003), casual observations of cowbird species were noted in survey areas as well as numbers of other breeding vireo species.

Results

We spent 82.0 field hours in Black-capped Vireo habitat over 7 days. At least 23 adult BCV were observed with 15-17 males and 8 females. Two family groups were observed with at least 5 hatch-year (HY) BCV. Three active nests and one nest start were found. No Brown-headed Cowbird (*Molothrus ater*) parasitism was observed.

Green Gulch/Maple Canyon- Five or 6 male and 3 female BCV were observed and 1 family group with 2-3 HY was detected in 2004; two active nests found. (Five adult BCV observed in 2003; 1 male heard in 2002; 1 male in 2001; 0 in 2000).

Area surveyed on 28 May from 0745h-1115h and again on 29 May from 0630h-1000h. Area checked briefly on 31 May and again on 3 June (14.5 observer hours).

All drainages in the Maple Canyon area of Green Gulch were surveyed including those on the SE side of Basin Road (Route 14) (Figure 2).

Three male BCV were heard singing south of Basin Road in areas of the broad drainage east of "Solo Mountain" on 28 May. One of these males was observed to be an after third-year (ATY) bird. This male and an after hatch-year (AHY) female were seen to be constructing a nest in a gray oak (*Quercus grisea*) (Nest 04-1: 29° 17' 20.4"N, 103° 16' 00.8"W). An unseen male was heard singing down slope and to the east. Another male was heard/seen and followed upslope and to the west of the nest area along the SE slope of "Solo Mountain".

On 29 May, a second-year (SY) male and an AHY female were observed building a nest just a few meters south of Basin Road in the drainage across from the Maple Canyon pullout/gate. This nest was also in a gray oak (Nest 04-3: 29° 17' 33.8"N, 103° 16' 23.0"W).

On 31 May, an SY male was observed below the lower pullout on Basin Road. This male probably represented another territory, but it is possible that he could have been the male heard down slope on 28 May.

On 3 June, an ASY male and AHY female were seen tending to at least 2, probably 3 hatch-year (HY) BCV in the canyon below the NW slope of "Solo Mountain". Also on that day, the 2 nests found under construction were revisited. The higher nest (04-1) was seen to contain 3 BCV eggs and both adults were in the vicinity. The nest right off the road (04-3) was being sat-upon by the female who was not flushed. The SY male was also in the vicinity. No outcome of either of these nests was determined.

On 17 June, an adult male with 3 HY BCV was observed by a park visitor and reported to park staff (M. Flippo pers. comm.). These birds were observed well north of the Basin Road up toward the Maple Canyon drainage and probably represented a territory not detected by our surveys.

Four male BHCO were heard/seen in this area. One male Gray Vireo (*Vireo vicinior*; GRVI) and 1 male Bell's Vireo (*Vireo bellii*; BEVI) were observed.

Switchbacks (Lost Mine Trail) – Three male and 1 female BCV were observed in 2004. (Two BCV observed in 2003; 3 in 2002; 3 in 2001; 6 in 2000).

Area surveyed briefly on 29 May from 1015h-1145h and on 31 May 0745h-0845h; Surveyed again on 1 June from 0630h-1200h. (10.5 observer hours).

The canyon below (north of) Basin Road as well as all side- and upper-drainages from the upper pullout on the switchbacks below the Lost Mine Trail trailhead down to below the Basin Campground were surveyed (Figure 3).

On 29 May, an ASY male and AHY female BCV were heard and seen in drainage below "25 MPH" sign on Basin Road, about halfway between the 2 pullouts. They were seen using this drainage and adjacent draws from the canyon bottom all the way up to the road. On 31 May, an AHY male was heard singing below first (upper) pullout. He was briefly counter-singing with another male lower down the main canyon that was likely the male from the previously detected pair. On 1 June, another AHY male was detected lower down the canyon toward the Basin Campground. He, too, was briefly heard counter-singing with male from "middle" territory.

One male GRVI was heard in this area and no BHCO were observed.

Window Trail/Window View Trail/upper Oak Canyon and Campground Basin- Three male and 1 female BCV observed and 1 active nest found. (Three BCV observed in 2003; 3 in 2002; 0 in 2001; 2 in 2000).

Areas surveyed on 29 May from 1145h-1230h; on 31 May from 0845h-1330h; and on 1 June from 0645h-1130. (17.0 observer hours).

The drainages of upper Oak Canyon from the intersection of the Laguna Meadows/Pinnacles Trails northwestward in front of the Window View Trail to the Window Trail were surveyed. The Window Trail proper from the Group Campground trailhead to the pour-off was also surveyed (Figures 1 and 4).

On 29 and 31 May, we did not detect any BCV along the Window Trail including in the territories used in past years below the Group Campground or at the end of the Window Trail near the pour-off where a territory was observed in 2003 (Maresh 2003). Playback of BCV song was used at various spots along the trail and was played extensively in areas of prior territories. Park staff reported the observation of 1 male BCV at the end of the Window Trail on 4 July (M. Flippo pers. comm.).

On 1 June, upper Oak Canyon was surveyed. An AHY male was heard and followed through a series of small drainages below the Laguna Meadows/Pinnacles Trails intersection. This male was very vociferous but was never seen clearly in this area of very thick brushland. A female (and nest) were likely in the area but never observed.

A third-year (TY) male and AHY female were seen carrying food in a major side-canyon in front of (west of) the Window View Trail. A nest was discovered in a clump of evergreen sumac (*Rhus virens*) (Nest 04-10: 29° 16' 21.8"N, 103° 18' 27.4"W). The nest contained 3 BCV nestlings estimated to be about 6 days old.

An SY male popped-up in response to playback in another side canyon nearer the Window Trail proper. He retreated quickly and was never heard to sing.

Five GRVI and 2 BEVI were noted during the surveys of these areas. Surprisingly, no cowbirds were noted in BCV territories and few cowbirds were observed even in the campground and lodge areas.

Oak Spring to Window Pour-off and Oak Spring to Cattail Falls- No BCV observed. No BCV observed in 2003 (Cattail Falls not surveyed in previous years).

Areas surveyed on 29 May from 1830h-2030h and on 31 May from 1900h-2000h (6 observer hours).

The area between Oak Spring and the Window pour-off was surveyed in the late afternoon of 29 May and the drainage below Cattail Falls was surveyed late afternoon on 31 May (Figure 1). No BCV were observed during the survey. However, a single, singing male was found by a park visitor on 23 July where the dirt track crosses Oak Creek (N. Wallisch, pers comm.). The drainage below Cattail Falls that joins Cottonwood Creek contained even more extensive areas of what seemed to be highly suitable habitat than what was previously noted below the Oak Spring/Window pour-off drainage (Maresh 2003). These areas should continue to be checked in future surveys.

Two BEVI and 2 GRVI were noted in this area.

Blue Creek Canyon- One or 2 male and 1 female BCV observed. (Four adult BCV observed in 2003; 3 in 2002; 0 in 2001; 0 in 2000).

Area surveyed on 2 June from 0700h-1230h (11 observer hours).

Blue Creek Canyon and most side canyons with appropriate habitat between Homer Wilson Ranch and the pinyon-oak woodland at the base of the Chisos were surveyed (Figure 5).

A male BCV was heard singing well upslope in the same major side canyon on the southeast side of the main canyon where 3 territories were observed in 2003 (Maresh 2003). Further upslope, an SY male was heard and seen. This was likely a second male but 2 birds were never seen or heard singing simultaneously from the 2 areas, so it is possible that 1 male was using this entire area. An AHY female was observed vigorously straddling a Greater Roadrunner (*Geococcyx californianus*). The "upper" SY male briefly joined the female in harassing the roadrunner but quickly returned to where he came from way up on the side-slope of this canyon. The female silently persisted in the area for some time after the roadrunner had left and a nest was strongly suspected but was not found.

Nine male Bell's Vireo and 2 male GRVI were observed in Blue Creek Canyon and 3 male BHCO were observed.

Pine Canyon- No BCV observed in 2004. (Zero in 2003; 1 in 2002; 1 in 2001; no data for 2000).

Area surveyed 28 May from 1845h-2000h (2.5 observer hours).

The Pine Canyon trailhead area was briefly surveyed in the late afternoon on 28 May (Figure 1). Playback was used extensively but there was no response to the tape.

No other vireo species or cowbirds were noted. Bird activity was very low in general.

Juniper Canyon- Two Male and 1 female BCV observed. Three male and 2 female BCV observed. One active nest found. Nest contents and outcome unknown. (Five adult BCV observed in 2003; 4 in 2002; 5 in 2001; 6 in 2000).

Area surveyed 30 May from 0730h-1300h (11.0 observer hours).

The Juniper Canyon drainage was surveyed from near the trailhead to the pinyon-oak woodland near base of the Chisos (Figure 6). The lower drainage was investigated for suitable habitat and we did not arrive in areas of previously occupied habitat until mid-morning. An ASY male and AHY female were seen in the area south of "the point" (Maresh 2003). A second unseen AHY male was heard singing above the confluence of major side drainage with the main canyon bottom.

Juniper Canyon has been the most consistently occupied area of Black-capped Vireo habitat and we felt like we likely missed some territories due to the late arrival in good habitat when the day was already beginning to get hot and bird activity in general was low.

One male each of GRVI, BEVI and BHCO was noted in Juniper Canyon.

Panther Canyon- One male and 1 female plus 3 HY BCV observed and 1 or possibly 2 nest starts were found. Area not surveyed in previous years.

Area surveyed on 2 June from 1830h-2100h and again on 3 June from 1815h-2100h (7.5 observer hours).

Both forks of Panther Canyon were surveyed in response to a report by park staff of a possible BCV sighting (M. Flippo pers. comm.) (Figure 7). In the late afternoon of 2 June we found an SY male and AHY female tending at least 3 HY BCV in the northern fork. We also found what was likely the start of a second-brood nest (Grzybowski 1995) under construction in a Chisos Red Oak (*Quercus gravesii*). Both adults were observed returning numerous times to this incomplete nest. It is unknown whether nest was ever completed or used. Another possible nest start was found a bit further up-canyon in a clump of evergreen sumac. This portion of the canyon contained some of the best-looking Black-capped Vireo habitat to be found at Big Bend. It is very probable that BCV have been using this area for a long time and had just never been detected in this little-visited canyon.

The Panther Spring fork of Panther Canyon was investigated on 3 June. No BCV were observed and although some suitable habitat was present, this fork is likely much less attractive to BCV.

Buttrill Spring (Rosillos Mountains)- No BCV observed.

Area surveyed on 3 June from 0720h-0920h (4 observer hours).

A brief expedition was made to the north side of the Rosillos Mountains to investigate the possibility of finding more areas of BCV habitat. We walked the drainage from Harte Ranch Road up to Buttrill Spring. Vegetation along the drainage might be considered as extremely marginal BCV habitat. Heavy erosion was noted along the drainage, especially in the vicinity of the spring. At the spring, there was a stand of large pecan (*Carya illinoensis*) and willow (*Salix gooddingii*) trees and numerous Bell's Vireos were observed. Seven singing male BEVI were noted mostly packed around the spring and wet areas in the upper drainage. However, 4 BHCO were also observed hanging-out in this relatively small area.

It is unlikely that the Buttrill Spring drainage will support a BCV territory anytime in the near future and probably does not need to be surveyed if only limited time is available.

North Pulliam Bluff- Not surveyed in 2004.

Laguna Meadow- Not surveyed in 2004.

Nest Data

Nest	Location	Substrate	Status	Coordinates	Outcome
04-1	Green Gulch; well upslope S of Basin Rd.	<i>Quercus grisea</i>	28 May Under construction but fairly complete; 3 June- 3 BCV eggs	29° 17' 20.4"N, 103° 16' 00.8"W	Unknown
04-3	Green Gulch; just s of Basin Rd.	<i>Quercus grisea</i>	29 May- Under construction; 3 June- Female on nest- contents not checked	29° 17' 33.8"N, 103° 16' 23.0"W	Unknown
04-10	Oak Canyon/Window view Trail	<i>Rhus virens</i>	1 June- 3 BCV nestlings about 6 days old	29° 16' 21.8"N, 103° 18' 27.4"W	Unknown

Discussion

All sites that were known to have Black-capped Vireo breeding territories in recent years were surveyed (Maresh 2003). Although every effort was made to thoroughly survey these sites, the limited time allowed by our schedule and the nature of BCV habitat in Big Bend National Park (isolated patches separated by rough terrain) made it logistically difficult to visit most sites more than once. Negative data, *i.e.*, absence of BCV from some sites and low densities at others, could not be confirmed without repeated visits. Therefore, this survey methodology did not meet FWS guidelines for presence/absence or density determinations of BCV (USFWS 2003). Regardless of these limitations, I believe that a reasonably accurate survey of BCV was obtained in the areas visited.

Recovery from the long-term drought conditions that had persisted in the Big Bend region for several years seems to continue. After a dry winter, above average precipitation returned for the 2004 spring and summer seasons (NPS 2004a). This continued the recent pattern of extended periods of average or above average precipitation being punctuated by relatively short dry periods. Vegetation in all areas of BCV habitat as well as elsewhere in the park appeared healthy and verdant.

A total of 28 to 31 individuals was detected: 15-17 adult males (1 ATY, 3 ASY, 1 TY, 4-5 SY and 6-7 age unknown (except for AHY)), 8 adult (AHY) females plus 5-6 HY birds. Three active nests and 1 nest start were located. Numbers of adult vireos counted in 2004 (23-25) continue the trend of slow but steady increases over the past few years with 19 adults observed in 2003, 14 in 2002, 10 in 2001, 15 in 2000, and 12 in 1999. The number of the more readily detectable adult male BCVs observed this year reflect a similar trend (15-17 in 2004, 14 in 2003, 9 in 2002, 7 in 2001, 8 in 2000, and 9 in 1999). After holding stable for a number of years after the marked decline from a high of 36 individuals found in 1995 (Peck and Barlow 1998), this year's increase in total individuals observed may indicate a rebound in the BBNP Black-capped Vireo population to near pre-drought levels.

The observation of another 4 to 5 second-year males in this year's survey may suggest continued breeding success and good survivorship rates. Moreover, with 2 more family groups with 5 to 6 fledglings and 3 active nests observed, successful nesting efforts this year may continue the upward population trend. The apparent increase in breeding success observed over the past 2 or 3 seasons might be a result of the improved vegetative conditions and resource availability allowed by the ample precipitation. It may also signal a reversal of the low reproduction and high parasitism rates observed in drought years (Maresh and Rowell 2002, Peck and Barlow 2000).

Black-capped Vireo habitat is patchily distributed around and within the Chisos Mountains and is usually found in canyons and drainages at mid-elevations from about 4000 – 5600 feet (1220 - 1710 meters). In general terms, the habitat can be thought of as the layer of deciduous shrublands lying in the transition between the lower-elevation desert scrub and the higher pinyon-oak-juniper woodlands. Of course, there are rarely neat lines between the transition layers and fingers of shrubland habitat can be found along small drainages or gullies sticking into the desert scrub or on more xeric upland slopes between heavily wooded, moist canyons. Micro-geographical and abiotic factors such as slope, slope aspect, soils, frequency of flash flooding, etc., also certainly influence the distribution of suitable habitat.

Black-capped Vireos were observed in all areas known to have held territories in recent years. A "new" area of highly suitable and occupied habitat was identified in Panther Canyon this year as well. This relatively small, relatively isolated patch of habitat has likely hosted BCV territories before. Further, there are almost certainly more small, isolated and/or difficult to reach patches that regularly hold territories that have not been identified. Except for Pine Canyon (see above), utilization of areas of suitable habitat by BCV has been very consistent for many years (Maresh 2003). The distribution of territories within suitable habitat, though, has been much less consistent. Some sites, such as Juniper Canyon and the Switchbacks, have had close to the identical configuration of territories year after year. The exception being when 1 territory or another within these sites was either vacant or went undetected (see above). Other sites, such as the Green Gulch/Maple Canyon area and the Window Trail/Window View Trail/upper Oak Canyon area, however, have hosted territories in varied configurations. Both circumstances indicate an under-utilization of suitable habitat. Identification of areas of apparently unoccupied but high quality habitat (e.g. Oak Creek, Cattail Falls drainage) and areas of formerly occupied nesting habitat (e.g. Pine Canyon) further imply that habitat availability is not limiting the BCV population within the park. Regular pre- and post-survey reports from park staff and visitors of black-caps in some of these areas indicate utilization or at least investigation of potential habitat.

Scattered visitor reports from lower (desert) elevations (e.g. Dugout Wells, Rio Grande Village) probably represent, if properly identified, migrants or post-breeding wanderers.

Brown-headed Cowbird observations remained generally low compared to the large numbers seen during the height of the drought years (Maresh and Rowell 2001). Cowbird sightings were also dispersed between and within habitat patches with the only noted concentration being at Buttrill Springs. Brood parasitism has been shown to have an impact on BCV productivity in Big Bend (Maresh and Rowell 2001) but no evidence of nest parasitism has been detected in recent years. Cowbirds probably do not pose an immediate threat to the BBNP Black-capped Vireo population.

Meetings were scheduled to coincide with this year's BCV surveys to discuss the development of a fire management plan for Big Bend National Park. The effect of fire on Black-capped Vireos and other rare species in Chihuahuan Desert ecosystems is not well known and has been identified as a research need by the NPS (NPS 2004b). Several interested parties met to discuss how fire might benefit or harm the park's Black-capped Vireo population and site visits were made to a number of areas of BCV habitat to inspect and discuss how fire might affect those areas.

Vegetation in areas of occupied Black-capped Vireo habitat found in Southwest and Trans-Pecos Texas is thought to persist indefinitely in a state favorable to BCV due to the edaphic and climatic conditions of the region as well as other abiotic factors (Farquhar and Maresh 1998). Therefore, fire or other management practices that are required in more mesic regions within the vireo's range should generally not be necessary for the maintenance of habitat in this portion of their range.

As noted in the discussion above, habitat availability does not appear to be a limiting factor for the Big Bend BCV population. Therefore, any effort to expand areas of habitat or create "new" areas through the use of fire or other management techniques would probably not be useful and is deemed unnecessary at this time. Further, it is questionable as to how effective habitat manipulation would be in the park under the slow succession characteristic of vegetation in the region (Farquhar and Maresh 1998) and given the very limited understanding of fire behavior in these ecosystems (NPS 2004b).

Despite this uncertainty concerning fire and despite the fact that Black-capped Vireo habitat in Southwest and Trans-Pecos Texas typically does not contain large fuel loads (Farquhar and Maresh 1998), it was observed that some areas in and around BCV habitat did indeed have a considerable build-up of brush and woody debris in and between dense stands of vegetation as well as considerable herbaceous ground cover. Given the high use by park visitors in some of these areas, a considerable risk of accidental ignition exists. Further, the possibility of an accidental or natural-caused fire rapidly spreading through an entire canyon system or beyond is also a serious concern. A need to reduce these fuel loads to protect human health and safety, as well as property and resource concerns, was expressed by park personnel. It was agreed that a canyon-wide (or larger) wild fire that took out whole areas of BCV habitat would be detrimental to the species. It was also agreed that smaller, staggered and compartmentalized controlled burns to reduce fuel loads would likely have only minor impacts to the BCV population even if some amount of suitable habitat was removed. Initial burns, carried out on small sections under mild conditions, could be studied to better understand fire behavior in the Chisos ecosystems. Reaction and recovery of vegetation could be monitored as well to determine the effect of fire on vireo habitat.

Burn- and site-specific plans would need to be developed with the consideration of Black-capped Vireos, other species and other management needs in mind. For example, the extensive patches of beebrush (*Aloysia gratissima*) below the Switchbacks and near the Campground Basin were identified as would-be "targets" of fire management. It was agreed that if the stands of beebrush could be replaced by more diverse stands of woody shrubs, it would be beneficial to the

vireos that nest in that area. However, upon further discussion it was revealed that beebrush is particularly tenacious and resistant to “control” and would likely require frequent fires to be kept in check and this in turn would effectively result in an open grassland-type setting. It was pointed out that the vireo territories in that area were centered on the dense and diverse vegetation of the canyon bottom and along fingers of woody vegetation that followed drainages up, away from the bottom. Although the dense stands of almost monoculture beebrush between these fingers definitely did not seem to be the preferred use area in these territories, they were none-the-less important components providing cover in transit between draws as well as foraging habitat. Replacing the beebrush stands with an open grassland would likely make the area less attractive to black-caps. Careful consideration similar to this and close monitoring of results would be needed in each individual burn plan, at least until the fire ecology is better understood.

Of course, any burns would need to be conducted outside the BCV nesting season. The timing of burns should also take into consideration other nesting bird species and the seasonal needs of other taxa as well.

Recommendations

1. Continue annual census surveys of Black-capped Vireo within Big Bend National Park in areas of known habitat to monitor relative abundance.
2. If sufficient time and resources are allocated, implement a color-marking program to examine recruitment, dispersal, inter- and intra-seasonal movement and habitat use. Nesting activity should continue to be monitored to estimate productivity, to determine rates of cowbird parasitism and to detect other threats.
3. Continue surveys in areas of potential, but unoccupied habitat. Expand survey area to investigate isolated or hard to reach pockets of potential habitat.
4. Monitor population and distribution of cowbirds within Big Bend National Park. Monitor cowbird parasitism on BCV and other avian species.
5. Continue consideration of Black-capped Vireos and their habitat in ongoing development of fire management plan.

Acknowledgements

I wish to thank John Cornelius of the U.S. Army, Fort Hood, Texas and Carla Ebeling, from Angelo State University, San Angelo, Texas for assistance with field surveys. The title page photograph of the Rosillos Mountains is by Carla Ebeling. I also wish to thank Raymond Skiles and Mark Flippo of the National Park Service, Big Bend National Park, for assistance with this project.

Literature Cited

- Farquhar, C. C. and J. P. Maresh. 1998. Population Biology and Habitat Characterization of Black-capped Vireos at Dolan Falls Ranch Preserve, Val Verde County, Texas: 1997 Field Season. Report to The Nature Conservancy of Texas.
- Grzybowski, J. A. 1995. Black-capped Vireo (*Vireo atricapillus*). In The Birds of North America, No. 181 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, And The American Ornithologists' Union, Washington, D.C.
- Maresh, J. 2003. Survey of Black-capped Vireo, Big Bend National Park Brewster County, Texas, Spring 2003. Report to National Park Service.
- Maresh, J. and D. Hernandez. 1999. Census of Black-capped Vireo, Big Bend National Park, Brewster County, Texas Spring 1999. Report to National Park Service.
- Maresh, J. and G. Rowell. 2002. Survey of Black-capped Vireo, Big Bend National Park, Brewster County, Texas, Spring 2002. Report to National Park Service.
- . 2001. Survey of Black-capped Vireo, Big Bend National Park, Brewster County, Texas, Spring 2001. Report to National Park Service.
- NPS. 2004a. Big Bend National Park Official NPS Website, Rare Bird Records, Fall 2002 through Summer 2004. <http://www.nps.gov/bibe/birdpg.htm>
- .2004b. Big Bend National Park Official NPS Website, Natural Resources, Research, Research Needs. <http://www.nps.gov/bibe/resneed.htm>
- Peck, M. K. and J. C. Barlow. 1998. Survey of the Status of the Black-capped Vireo in Big Bend National Park, Brewster County, Texas for 1998. Report to National Park Service.
- .2000. Survey of the Status of the Black-capped Vireo in Big Bend National Park, Brewster County, Texas for 2000. Report to National Park Service.
- Texas Parks & Wildlife Department. 1999. Texas Biological and Conservation Data System. Austin, Texas.
- U. S. Fish and Wildlife Service. 2003. Endangered Species Permit TE039731-0. Albuquerque, New Mexico.
- . 1991. Black-capped Vireo (*Vireo atricapillus*) Recovery Plan. Austin, Texas.