Gray Vireo Monitoring in Northwestern and Southeastern New Mexico

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INTRODUCTION

The Gray Vireo (*Vireo vicinior*) is a Bird of Conservation Concern (USFWS 2002), inhabiting low-elevation piñon (*Pinus* spp.)-juniper (*Juniperus* spp.) woodlands in the southwestern United States, particularly where junipers predominate over piñon (Barlow et al. 1999, Schlossberg 2006). Although the Gray Vireo is not federally listed, the New Mexico Department of Game and Fish (2008) lists Gray Vireo as threatened in the State. In New Mexico, piñon-juniper habitat is widespread, but junipers are frequently cleared in an attempt to restore historical ecological conditions, increase forage production for livestock, or to conserve watersheds. In northwestern New Mexico, thousands of oil and gas wells dot the landscape, many in Gray Vireo habitat (Reeves 1999, Wickersham and Wickersham 2006). It is unknown to what extent oil and gas leasing and local juniper treatments affect Gray Vireos in New Mexico.

Because Gray Vireo habitat, threats, and/or management concerns vary regionally, we conducted monitoring projects in several locations in New Mexico from 2005–2007. During this time, we monitored a small number of Gray Vireo pairs in the Guadalupe Mountains of southeastern New Mexico; in 2007, we also monitored vireos in northwestern New Mexico, near Bloomfield. We presented three objectives at the 2008 Gray Vireo Symposium. First, we presented territory monitoring results for our sites in northwestern and southeastern New Mexico, including nest success, nest parasitism, and productivity. Second, we identified regional differences and evaluated regional threats. Finally, we presented results of point count surveys in juniper woodland, near Lybrook, New Mexico, that was slated for vegetation treatments (particularly sagebrush thinning). Although our projects were small and, perhaps, not indicative of regional associations, often what we learn with small projects can help us understand a variety of different situations and contribute to the formation of management guidelines.

METHODS

TERRITORY MONITORING

In the Guadalupe Mountains of southeastern New Mexico, we monitored 10–14 Gray Vireo territories from 2005–2007 in the Lincoln National Forest along Highway 137, about 10 km east of Queen, Eddy County. In northwestern New Mexico, we selected 10 Gray Vireo territories to monitor in 2007 on Bureau of Land Management land in Gobernador Canyon, about 25 km east of Bloomfield, San Juan County. We visited territories approximately every 10 days between early May and mid-July, or as often as necessary to determine nesting outcome. During each monitoring visit, we noted the number of Gray Vireo eggs and nestlings present, as well as the number of Brown-headed Cowbird (*Molothrus ater*) eggs and nestlings in each Gray Vireo nest. In this expanded abstract, we present nest success as the percentage of nests fledging at least one Gray Vireo. We present nest parasitism as a percentage of parasitized nests, defining a parasitized nest as a nest observed to contain a cowbird egg or nestling at any time while the nest was active. We present productivity as the average number of Gray Vireos fledged from successful nests.

POINT COUNT SURVEYS

We conducted point count surveys at 48 survey points in three proposed vegetation treatment plots and one control plot totaling 340 ha on Crow Mesa, along Highway 550 near Lybrook, New Mexico. Thirty-five survey points were on treatment plots and 13 survey points were on the control plot. The

size of the plots and our spacing of points at least 250 m apart prevented the establishment of more than 48 points. Treatment plots were generally restricted to mesa tops that contained juniper savanna; one plot contained substantial sagebrush. We visited each point once in June 2007 and recorded all birds seen or heard for five min while standing at the point. We began surveys within 30 min after sunrise and concluded within four hrs; completion of surveys at all 48 points took three mornings. We present the number of Gray Vireos detected and all other federal or state-listed species, and United States Fish and Wildlife Service Birds of Conservation Concern (2002).

RESULTS

TERRITORY MONITORING

In the Guadalupe Mountains, we located 32 nests from 2005–2007 and documented parasitism by Brown-headed Cowbirds at 16 of the 26 (62%) nests where parasitism could be determined (Table 1). At both sites, parasitism could not be determined at all nests because some nests apparently failed before we could verify that a full clutch was laid. Of the 27 nests in which the outcome was determined, 8 (32%) fledged at least one Gray Vireo young (Table 1). An average of 1.7 Gray Vireo young fledged per successful nest.

In northwestern New Mexico, we monitored 11 Gray Vireo nests in 2007 (Table 1). Unlike the Guadalupe Mountains site, we found only one case of nest parasitism (1 of 9 nests; 11%). Three Gray Vireo nests (27%) fledged young and eight nests (73%) apparently failed. Successful nests fledged an average of 2.7 vireos. Gray Vireos nested an average 338 m from the nearest gas well pad (range = 120–636 m, n = 11).

TABLE 1. Summary of Gray Vireo (*Vireo vicinior*) territories monitored in the Guadalupe Mountains of New Mexico from 2005–2007 and in northwestern New Mexico in 2007.

	Guadalupe site	Northwestern site
Territories monitored	10–14 / year	10
Nests monitored	32	11
Nests parasitized	16 of 26, 62%	1 of 9, 11%
Nests fledging vireos	8 of 27, 32%	3 of 11, 27%
Vireo productivity	1.7 young / successful nest	2.7 young / successful nest

In addition to higher parasitism and lower average productivity at Gray Vireo nests in the Guadalupe Mountains, we noted several differences between regions. Gray Vireos at the northwestern site nested almost exclusively in junipers (10 of 11; 91%), whereas vireos at the Guadalupe Mountains site regularly nested in either oaks (13 of 32; 41%) or junipers (17 of 32; 53%). Gray Vireos at the northwestern site nested higher (averaged about 3 m above the ground) than vireos at the Guadalupe Mountains site (averaged < 2 m).

POINT COUNT SURVEYS

We observed 35 bird species during point count surveys in 2007, including 20 Gray Vireos. Seven Gray Vireos were recorded during surveys on the control plot and 13 were recorded during surveys on the treatment plots. In the plot with substantial sage, we observed two United States Fish and Wildlife Service Birds of Conservation Concern (2002), both sage-obligate species: Brewer's Sparrow (*Spizella breweri*) and Sage Sparrow (*Amphispiza belli*).

DISCUSSION

Our results demonstrate regional differences in Gray Vireo nesting ecology and the need to formulate management guidelines that are responsive to this variation. In northwestern New Mexico, gas and oil development should be considered as a potential future threat to Gray Vireos. Gas and oil wells probably have little effect on Gray Vireo nest-site selection, or at least do not deter breeding by the species, but continued leasing and development might affect territory selection by reducing and fragmenting suitable habitat in the future. In this current period of almost certain oil and gas expansion in northwestern New Mexico, annual Gray Vireo studies are strongly advised to identify current nesting population size, potential population changes, and evaluate current levels of threat.

Juniper reduction is potentially a more widespread threat, although the Guadalupe Mountains, with its more rugged topography and greater shrub species diversity, might be less vulnerable than other areas. Juniper reduction likely affects Gray Vireo and other breeding birds strongly associated with junipers, including Gray Flycatcher

(*Empidonax wrightii*) and Juniper Titmouse (*Baeolophus griseus*). Generally, we recommend that land managers avoid treating junipers in occupied Gray Vireo habitat during the nesting season (late April through August) or do so only after thorough surveys for nesting birds. At our point count monitoring site, we extend this recommendation to sagebrush habitats to avoid impacts to other listed and sensitive species.

CONCLUSIONS

- The variety of threats and unique characteristics of Gray Vireo breeding ecology demands different solutions and management guidelines to accommodate this variety.
- Gray Vireos might still be locally common, and even numerous in limited areas, but we should not underestimate current and future threats in occupied habitats.

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