Plumbeous Vireo (*Vireo plumbeus*)

NMPIF level: Species Conservation Concern, Level 2 (SC2)

NMPIF assessment score: 15

NM stewardship responsibility: High

National PIF status: No special status

New Mexico BCRs: 16, 34, 35

Primary breeding habitat(s): Mixed Conifer Forest, Ponderosa Pine Forest, Pinyon-Juniper Woodland

Other habitats used: Montane Riparian, Madrean Pine-Oak Woodland, Southwestern Riparian

Summary of Concern

Plumbeous Vireo is found across the interior western United States. Numbers are generally stable rangewide, but local population trends vary widely. In New Mexico, it is associated with open, coniferous woodlands supporting a deciduous understory and riparian areas. The species is extensively parasitized by cowbirds and may be susceptible to the loss of winter habitat.

Associated Species

Broad-tailed Hummingbird (SC2), Western Wood-Pewee, Mountain Chickadee, White-breasted Nuthatch, Pygmy Nuthatch, Western Bluebird (SC2), Grace's Warbler (SC1), Black-headed Grosbeak, Brown-headed Cowbird

Distribution

Plumbeous Vireo breeds in the interior, mostly montane areas of the western United States and Mexico, south to Honduras and El Salvador (Curson and Goguen 1998). The species occurs from southern Montana and the Black Hills of South Dakota south through Wyoming, Colorado, New Mexico and West Texas, and west through southern Idaho, Utah and Nevada to east-central California. It also breeds in the trans-Pecos of Texas and the Black Hills of South Dakota.

In New Mexico, Plumbeous Vireo breeds in lower mountain canyons statewide, favoring areas with a mix of pines and deciduous trees (Parmeter et al. 2002). It is an uncommon spring and rare fall migrant through lowlands statewide.

Ecology and Habitat Requirements

Plumbeous Vireo typically breeds in habitat dominated by ponderosa pine and is also widely associated with pinyon-juniper woodlands, particularly denser pinyon-juniper woodlands at higher elevations (Curson and Goguen 1998). The species prefers warm, dry forest over cool, moist forest, but it may occur in Douglas-fir (*Pseudotsuga menziesii*) and mixed conifer-aspen (*Populus tremuloides*) stands (Curson and Goguen 1998). It is primarily found at an elevational range of 1150-2500 m but also locally in deciduous riparian woodlands in arid intermontane basins above 920 m (Barlow 1977). Habitat in New Mexico is primarily ponderosa pine forest and pinyon-juniper woodland, as well as pine-oak woodland and riparian areas. It generally favors open, coniferous woodlands with some deciduous understory, and in steep terrain favors canyon bottoms. In riparian woodlands of New Mexico, the species inhabits cottonwood, boxelder, and willow (Curson and Goguen 1998). Migration habitat is similar to breeding habitat but a wider variety of habitats is used. Diet consists almost entirely of arthropods captured primarily by foliage gleaning, but also by probing, pecking, and flycatching.

Nesting activity in New Mexico begins in late April at lower elevation sites and early to mid-May at higher elevations (Travis 1992). Overall, nests tend to be placed within understory vegetation or on low tree branches. In pinyon-juniper woodland, nests are placed either on low branches or near the top of pinyons (Curson 1996). Pinyon is the most commonly used substrate in this habitat, but juniper, oak, and mountain mahogany are also used. Within mixed conifer habitat in northeastern New Mexico, most nests are placed in understory shrubs and saplings, especially oak, ponderosa pine, and Douglas-fir.

The nest is an open cup composed of grass, inner bark strips, soft plant fibers, rootlets, and hair, and it is suspended from a twig (Curson and Goguen 1998). Typical clutch size is 4, with a range of 3-5 (Curson and Goguen 1998). Only one brood per season is typically produced, but re-nesting attempts continue into early July if the first clutch fails. The incubation period is reported to be 13.8 ± 1.4 d (Curson and Goguen 1998) and 15 d (Marvil and Cruz 1989).

Brood parasitism by Brown-headed Cowbirds is extensive. In pinyon-juniper woodlands of northeastern New Mexico from 1992-1996, annual parasitism rates averaged 82.7% (n=75, Goguen and Mathews 2000). However, adjacent mixed conifer habitats experienced only 33% parasitism (n=19). Parasitism appeared to decrease with increased distance from cowbird feeding areas. In a Colorado study, parasitism was 50% over a 13-year period (range 37.5-65.7%, Chace and Cruz 1999). Parasitized nests were closer to openings in the ponderosa canopy and had less canopy cover than unparasitized nests, and canopy cover was the best predictor of parasitism. Cowbirds are apparently better able to observe vireo nesting activity from open canopies (Chace and Cruz 1999).

In a study of cowbird parasitism at a wildland-urban interface in Colorado, cowbirds used urban areas for foraging and roosting but traveled to a ponderosa pine wildland preserve to parasitize songbird nests, including those of Plumbeous Vireo (Chace et al. 2003). In a New Mexico study in pinyon-juniper woodland, cowbird parasitism was the primary cause of nest failure (DeMarco et al. 2000). Failure during the laying stage occurred due to desertion of nests with cowbird eggs, and failure during the

nesting stage occurred because vireos starved in the presence of cowbird nestlings. Parasitized nests rarely fledged any young. In the same study, the mean number of vireos fledged from unparasitized nests was 2.36, whereas parasitized nests fledged an average 0.24 vireos and 0.44 cowbirds. Pairs that reared cowbirds did not re-nest. Predation rate was 20% of parasitized nests and 18% of unparasitized nests. The behavior of breeding Plumbeous Vireos is very conspicuous around the nest, which may account for the high rates of brood parasitism (DeMarco et al. 2000).

Conservation Status

Species Assessment

DISTRIBUTION	4
THREATS	3
GLOBAL POPULATION SIZE	3
LOCAL POPULATION TREND	1
IMPORTANCE OF NEW MEXICO TO BREEDING	4
COMBINED SCORE	**15**

Plumbeous Vireo is a Species Conservation Concern, Level 2 species for New Mexico, with a total assessment score of 15. It receives a high vulnerability score of 4 from PIF for its relatively limited non-breeding distribution.

Population Size

PIF estimates a total species population of 2.7 million, 80% of which occurs in the United States. The size of the New Mexico population is estimated at 580,000 birds, or 21.6% of the global population. Based on BBS data, some of the highest densities occur in New Mexico. Densities in north-central New Mexico range from 2.2 pairs/40 ha in pinyon-juniper to 4.8 pairs/40 ha in oak woodlands and 5.0 pairs/40 ha on canyon slopes (Stahlecker et al. 1989).

Population Trend

BBS data indicate that overall the population appears to be stable. In New Mexico, the population appears to be increasing despite extensive brood parasitism by Brown-headed Cowbirds. BBS data for 1966-2006 are:

	Annual Trend (%)	P-Value	Number of Routes
New Mexico	2.8	0.08	24
FWS Region 2	0.9	0.45	48
Western BBS	0.1	0.91	164

Threats

This species is sensitive to the degradation of breeding habitat, especially the chaining of pinyon-juniper woodlands and clearing of forest and woodland habitats. Livestock overgrazing can lead to considerable degradation of habitat quality by creating feeding areas for cowbirds (Curson and Goguen 1998). Residential development at the wildland-urban interface can provide roosting and foraging habitat for Brown-headed Cowbirds that may then parasitize songbirds breeding in nearby habitat (Chace et al. 2003). Any activities that lead to increased cowbird abundance or access (e.g., via increased canopy openings) will likely impact Plumbeous Vireo reproductive success. This species is also particularly susceptible to tropical deforestation on its wintering grounds (Petit et al. 1995).

Management Issues and Recommendations

This species is of conservation concern in New Mexico because a considerable proportion of the global population breeds in the state. Although the New Mexico population is apparently increasing, the species is extensively parasitized by Brown-headed Cowbirds. In ponderosa pine habitats, silvicultural thinning appears to improve habitat quality and increase vireo densities (Curson and Goguen 1998). However, because lower canopy cover and more canopy openings have also been associated with increased cowbird parasitism, managers should seek to reduce anthropogenic sources of canopy openings (Chace and Cruz 1999). Management should focus on retaining healthy ponderosa pine forests, pinyon-juniper woodlands, and middle elevation and montane riparian areas. Overgrazing by livestock or rural development that creates cowbird feeding areas should be avoided. In a wildland-urban interface, larger preserves, decreased residential encroachment, and reduced perforation by trails and roads could reduce cowbird impacts (Chace et al. 2003).

NMPIF Recommendations

- Maintain open conifer woodlands, especially ponderosa pine forests and pinyon-juniper and pine-oak woodlands; avoid clear-cutting and chaining.

- Maintain middle elevation and montane riparian areas with a mix of riparian tree species and a vibrant shrub understory.
- Avoid overgrazing by livestock and limit the creation of cowbird feeding sites. Move cattle frequently to reduce overparasitism of any one particular area, especially in riparian areas.
- Conduct research on habitat correlates of Brown-headed Cowbird parasitism and monitor the impacts of cowbird parasitism on breeding success.
- Conduct basic research on demography and population dynamics: identify source and sink populations to determine focal areas for conservation and management.

Species Conservation Objectives

NMPIF Objectives

- Maintain or increase the breeding population in New Mexico.

Sources of Information

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