

# Bell's Vireo

*Vireo bellii*



Photo by Martin Meyers

## Habitat Use Profile

Habitats Used in Nevada	
Mojave Lowland Riparian (Mesquite-Acacia) (Springs)	
Key Habitat Parameters •	
Plant Composition	Cottonwoods, willows, saltcedar, mesquite (particularly honey mesquite), arrow-weed, <i>Baccharis</i> <sup>11</sup>
Plant Density & Size	Dense shrub understory up to 3 m [10 ft] high; <sup>1</sup> tree overstory either relatively open or absent
Mosaic	Prefers structurally diverse habitat and patches of saturated soils; <sup>11</sup> in areas dominated by saltcedar, interspersions of some native trees increases habitat value
Distance to Water	< 1,000 m [0.6 mi] from water; standing water is an important habitat element <sup>11</sup>
Response to Vegetation Removal	Negative, especially for shrub layer <sup>8, 11</sup>
Area Requirements •	
Minimum Patch Size	Probably > 5 ha [12 ac], <sup>EO</sup> preferably with opportunity to place territory > 400 m [1,300 ft] from habitat edge <sup>10</sup>
Recommended Patch Size	> 20 ha [49 ac] <sup>11, 12, EO</sup>
Home Range	0.2 - 1.6 ha [0.5 - 4.0 ac] <sup>11</sup>

## Conservation Profile

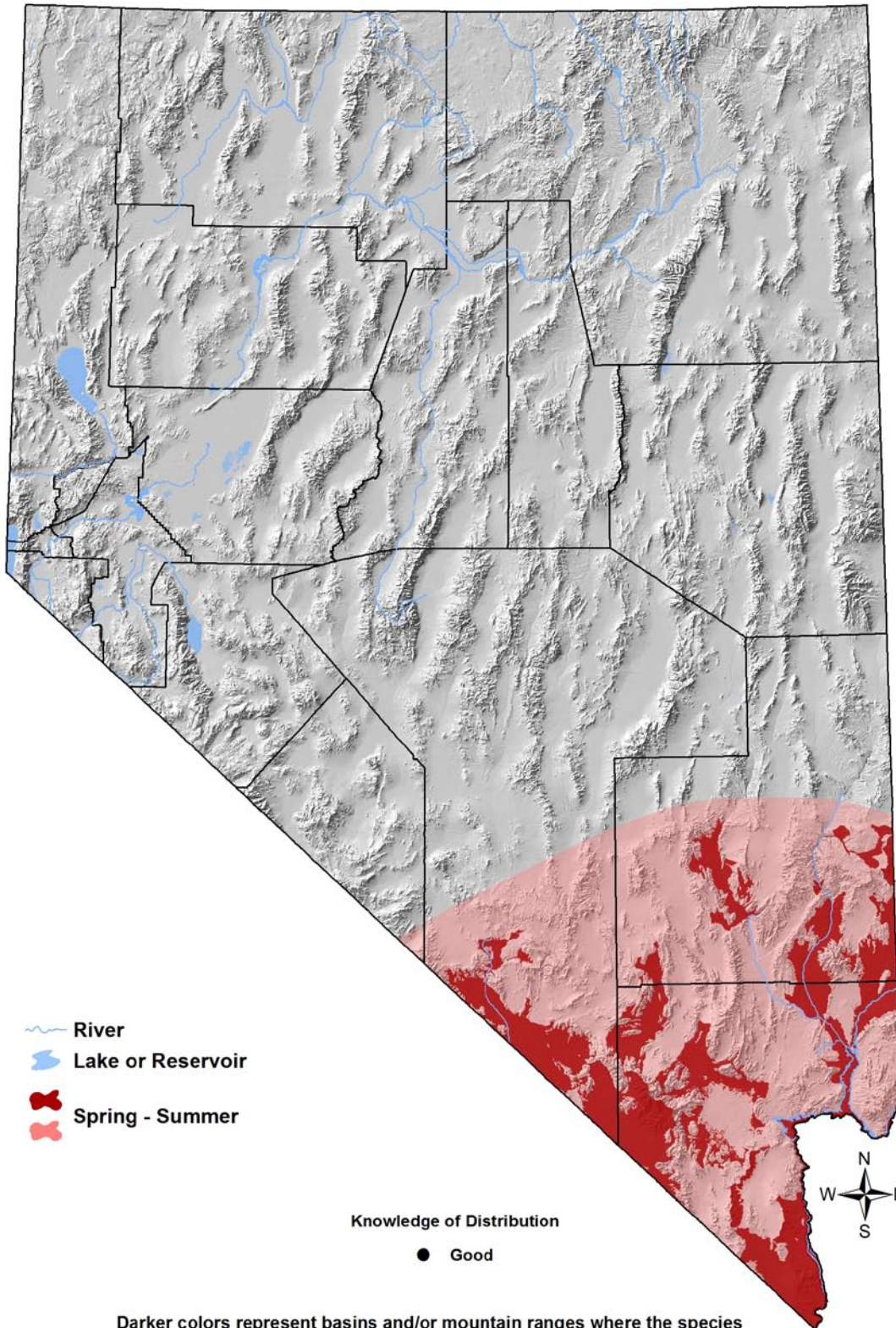
Priority Status	
Conservation Priority Species	
Species Concerns	
Historical and recent declines Restricted habitat Small population size Habitat threats	
Other Rankings	
Continental PIF	Watch List
Audubon Watchlist	Red
NV Natural Heritage	S2B
USFWS	Bird of Conservation Concern, Migratory Bird
BLM	None
USFS	None
NDOW	Conservation Priority
Other	Covered by Clark County MSHCP <sup>4</sup> and Lower Colorado River MSCP <sup>18</sup>
Trends	
Historical •	Rangewide declines <sup>11, 16</sup>
Recent •	Persistent declines of ~ 2.7% / year, most recently stabilizing <sup>16</sup>
Population Size Estimates	
Nevada (NBC) •	1,000
Global •	1,100,000 <sup>14</sup>
Percent of Global	< 1%
Population Objective	
Increase by 100% <sup>14, EO</sup>	
Monitoring Coverage	
Source	Nevada Bird Count, LCR MSCP <sup>18</sup>
Coverage in NV	Good
Key Conservation Areas	
Protection	Muddy and Virgin Rivers, Ash Meadows NWR, Meadow Valley Wash
Restoration	Same

## Natural History Profile

Seasonal Presence in Nevada	
Spring - Summer	
Known Breeding Dates in Nevada	
April – July <sup>6</sup>	
Nest and Nesting Habits	
Nest Placement	Suspended from dense riparian branches, 0.5 - 1.5 m [1.6 – 5 ft] above ground <sup>11</sup>
Site Fidelity	High <sup>11</sup>
Food Habits	
Basic	Arboreal and shrub gleaner
Primary Diet	Insects and spiders <sup>11</sup>
Secondary Diet	n/a

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Darker colors represent basins and/or mountain ranges where the species has been recorded within the past 12 years. Lighter colors represent the broader area within which the species is presumed to occur in appropriate habitat types.

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## Overview

The only Bell's Vireo subspecies currently known to be present in southern Nevada is *Vireo bellii arizonae*, the Arizona Bell's Vireo. However, the federally endangered Least Bell's Vireo (*V. b. pusillus*) has recently been documented < 50 km [30 mi] from Nevada in the Tecopa – Shoshone area of California (Carl Lundblad, *pers. comm.*), and until pending genetic tests are completed, the possibility that Least Bell's Vireos are present in Nevada's Ash Meadows NWR or other border areas cannot be dismissed. Regardless, the Arizona Bell's Vireo is a conservation concern in its own right because of long-term population declines and continuing threats to its lowland riparian habitats.

Bell's Vireos breed in riparian areas dominated by willow, cottonwood, riparian mesquite, or salt cedar,<sup>11</sup> but in all cases presence of dense understory is the crucial habitat feature. Research consistently shows that the risk of cowbird parasitism<sup>11</sup> and sometimes nest predation<sup>3</sup> decreases as understory vegetation becomes denser. Most recommendations for habitat management and restoration focus on increasing the density of understory vegetation.<sup>3,17</sup> In one restoration project, vireo abundance more than doubled within four years of cattle removal (and resulting increases in understory density) on the San Pedro River in Arizona.<sup>8</sup> In addition to understory density, patch size is also important. Bell's Vireos were found to be more abundant and successful in larger cottonwood and willow patches (> 160 ha [435 ac]) in the lower Colorado River valley.<sup>11,12</sup> Finally, presence of nearby surface water is also an important component of habitat suitability.<sup>10,11</sup>

The Bell's Vireo has adopted salt cedar as a breeding substrate, and several studies have shown that nesting densities in saltcedar and native riparian vegetation are roughly comparable,<sup>1,11</sup> although this may be less applicable in hotter desert climates.<sup>19</sup> On the San Pedro River in Arizona, Bell's Vireos had similar densities in saltcedar and native vegetation, although nest production was higher in native vegetation.<sup>2</sup> In surveys along the lower Colorado River,<sup>5</sup> Bell's Vireos were generally neutral to the amount of saltcedar present, but they did not use any sites where saltcedar cover exceeded 90%, suggesting that saltcedar stands with a native vegetation component are more suitable than monotypic saltcedar. Restoration projects seeking to replace invasive saltcedar with native vegetation should be geographically and temporally staggered, and appropriately scaled to avoid eliminating large amounts of usable breeding habitat without concurrently generating native habitat. It is possible that, at least in some cases, reintroducing a native component to areas currently dominated by monotypic saltcedar is the most efficient short-term approach to restoration from the standpoint of the Bell's Vireo.

The Bell's Vireo is particularly susceptible to parasitism by Brown-headed Cowbirds (*Molothrus ater*), which can seriously impact populations within certain areas. However, cowbird parasitism is not thought to be a main driver of declines in Bell's Vireo, but rather a local contributing factor.<sup>11</sup> Cowbird trapping has been shown to increase nest success in *V. b. arizonae*,<sup>13</sup> and sometimes population size in *V. b. pusillus*,<sup>9</sup> but it is an expensive and short-term solution recommended only in emergencies.<sup>15</sup>

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## Abundance and Occupancy by Habitat

### Birds / 40 ha on NBC Transects in the Mojave Region

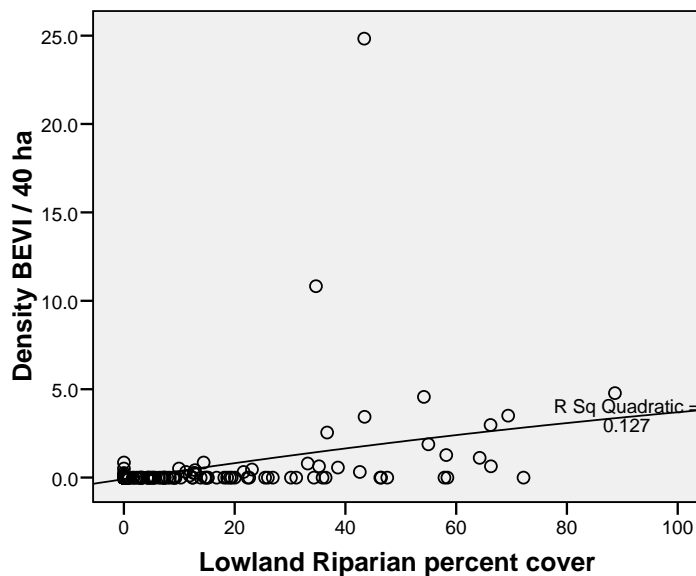
Primary Habitat at Transect	Transects Occupied	Birds/40 ha (95% C.I.)
Lowland Riparian	64% (23/36)	3.3 (1.1 – 5.5)
Mesquite-Acacia	21% (3/14)	0.4 (0.1 – 0.7)

- Pair densities across geographical range vary from 0.5 – 200 / 40 ha [0.005 – 2.0 / ac]<sup>11</sup>
- In southwest, densities in mesquite are highly variable<sup>11</sup>

## Nevada-Specific Studies and Analyses

### Landscape Associations (NBC)

As expected, transect-level logistic regressions indicated that Bell's Vireos were closely associated with Mojave Lowland Riparian habitat (which includes saltcedar), and were also more likely to be found in close proximity to water. All 30 transects where Bell's Vireos were detected were classified as Lowland Riparian based on either visual examination or the presence of at least 10% riparian cover as indicated within the GIS habitat classification. As shown in the figure below, density of Bell's Vireos appears to be closely related to the percent cover by Lowland Riparian habitat in the transect.



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## Main Threats and Challenges

### Habitat and Other Threats

- Loss or degradation of habitat and surface water due to water diversions, flood control, or groundwater pumping
- Loss of habitat to fire
- Removal of large amounts of saltcedar without concurrent creation of suitable replacement habitat
- Human disturbance may reduce nest success<sup>7, 10</sup>
- Cowbird nest parasitism<sup>11</sup>

### Research, Planning, and Monitoring Challenges

- Possible presence of Least Bell's Vireo in Nevada has not been conclusively resolved



Bell's Vireo habitat near the Lower Colorado River. Photo by Amy Leist.

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## Conservation Strategies

### Habitat Strategies

- The Mojave Lowland Riparian (p. Hab-11-1) habitat conservation strategy benefits this species
- Manage riparian habitat to provide early and intermediate successional stages characterized by dense shrub understory
- Protect existing native riparian woodlands (cottonwood, willow, and riparian mesquite) that exhibit suitable shrub understory density
- Restore degraded areas or those dominated by saltcedar, but plan restorations so that large amounts of saltcedar are not removed without concurrently creating suitable replacement habitat

### Research, Planning, and Monitoring Strategies

- Continue monitoring for population trends
- Develop fire management strategies balancing the need short-term habitat protection and long-term habitat regeneration
- Conduct nesting studies in Nevada to better assess the relative habitat quality of native vegetation versus saltcedar
- Investigate possible presence of Least Bell's Vireo within Nevada, especially at Ash Meadows NWR

### Public Outreach Strategies

- None identified

References: <sup>1</sup>Averill-Murray et al. (1999); <sup>2</sup>Brand et al. (2010b); <sup>3</sup>Budnik et al. (2002); <sup>4</sup>Clark County (2000); <sup>5</sup>GBBO (2009); <sup>6</sup>GBBO unpublished Atlas data; <sup>7</sup>Greaves (1989); <sup>8</sup>Krueper et al. (2003); <sup>9</sup>Kus and Whitfield (2005); <sup>10</sup>Kus et al. (2008); <sup>11</sup>Kus et al. (2010); <sup>12</sup>Lynn (1996); <sup>13</sup>Morrison and Averill-Murray (2002); <sup>14</sup>Rich et al. (2004); <sup>15</sup>Rothstein and Peer (2005); <sup>16</sup>Sauer et al. (2008); <sup>17</sup>Sharp and Kus (2006); <sup>18</sup>LCRMSCP (2004); <sup>19</sup>Walker (2006); <sup>E0</sup> Expert opinion