

# Distribution and abundance of Vesper Sparrow in the Central Valley

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## INTRODUCTION

The Vesper Sparrow (*Poocetes gramineus*) has been described as an uncommon winter resident in the Central Valley and bordering foothills, where two of the four recognized subspecies, Great Basin or Western Vesper Sparrow (*P. g. confinis*) and Oregon Vesper Sparrow (*P. g. affinis*), are known to occur (Zeiner et al. 1990; Grinnell and Miller, 1944). Small's (1994) description of major wintering areas in California for Vesper Sparrow included "the foothills surrounding the San Joaquin Valley and the drier interior valleys of the Southern Coast Range from Contra Costa County south to southeastern San Luis Obispo County (i.e., the Carrizo Plain)." The relative distribution and abundance of the two subspecies is not well known in California because their winter ranges broadly overlap (R. Erickson, pers. comm.), and because it is thought that the two subspecies cannot be reliably identified in the field (Rising and Beadle, 1996).

Zeiner et al. (1990) characterized the winter habitat of the Vesper Sparrow in California as grasslands, croplands, and open brushlands. Small (1994) provided a slightly more detailed account of the species typical wintering habitat noting that they may be found in arid grasslands, along the brushy borders of fields and farm, and in cultivated areas with newly germinating crops.

While these accounts of the status of the Vesper Sparrow in the Central Valley and the surrounding foothills are in general accurate, the local distribution and factors that influence it are no doubt considerably more complex. This report investigates the status of this species on Central Valley Christmas Bird Counts (CBCs) and discusses some of the geographical, biological, and climatic factors that may influence its distribution and abundance in this region.

## METHODS

We compiled 15 seasons (1985 to 2000) of CBC data for 18 count circles centered either in the Central Valley or in the surrounding foothills and valleys (Table 1 and Figure 1). CBC data were obtained from the Audubon internet website (<http://www.audubon.org/bird/cbc>). We selected CBCs that had been conducted at least 10 times in the 15-year period. The median and frequency (i.e., the percentage of counts when the species was detected) were calculated for each CBC circle. We selected the median, as opposed to the mean, recognizing that occasional erroneous identification of Vesper Sparrows likely occurs on CBCs, and that the median is less likely to be influenced by these errors.

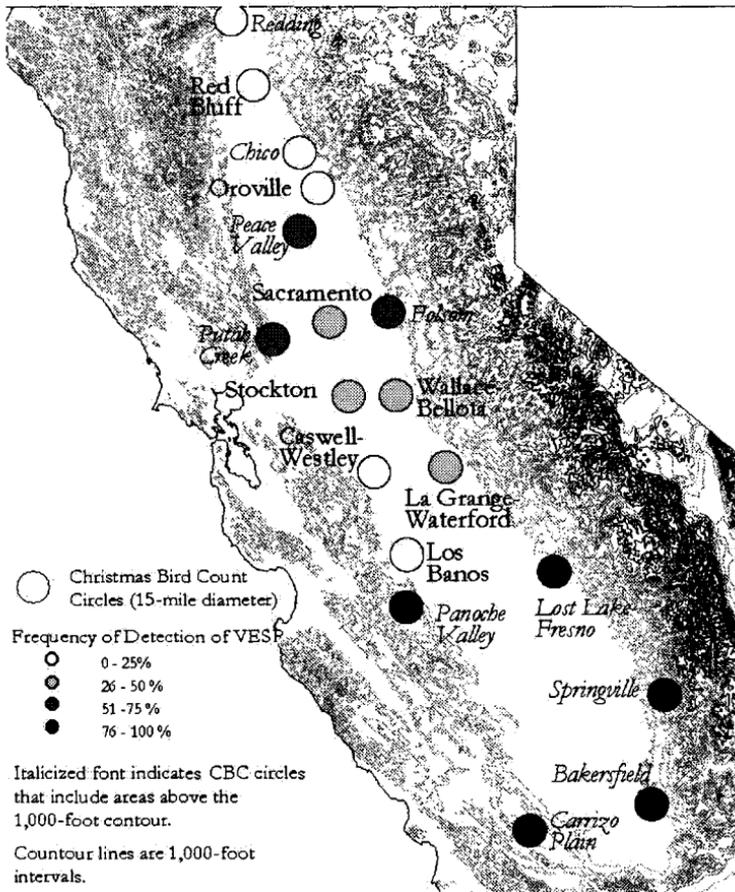


Figure 1. Topographical relief and locations of CBC circles in the Central Valley of California. Contour lines from GIS Data Depot (<http://data.geocomm.com>).

### *Elevation*

Elevational data were downloaded from the GIS Data Depot (<http://data.geocomm.com>). Count circles that included areas above the 1,000-foot contour line (valley-slope counts) were separated from circles that were located entirely below the 1,000-foot contour line (valley floor counts) by overlaying contour lines at 1,000-foot intervals onto a regional map of the Central Valley. With the exception of the Peace Valley CBC that includes the Sutter Buttes, the 1,000-foot contour line generally separates CBCs located in the interior of the Central Valley from those centered on the east and west sides of the valley floor. We compared CBC data for 10 valley-slope counts with data for 8 valley floor counts (Figure 1).

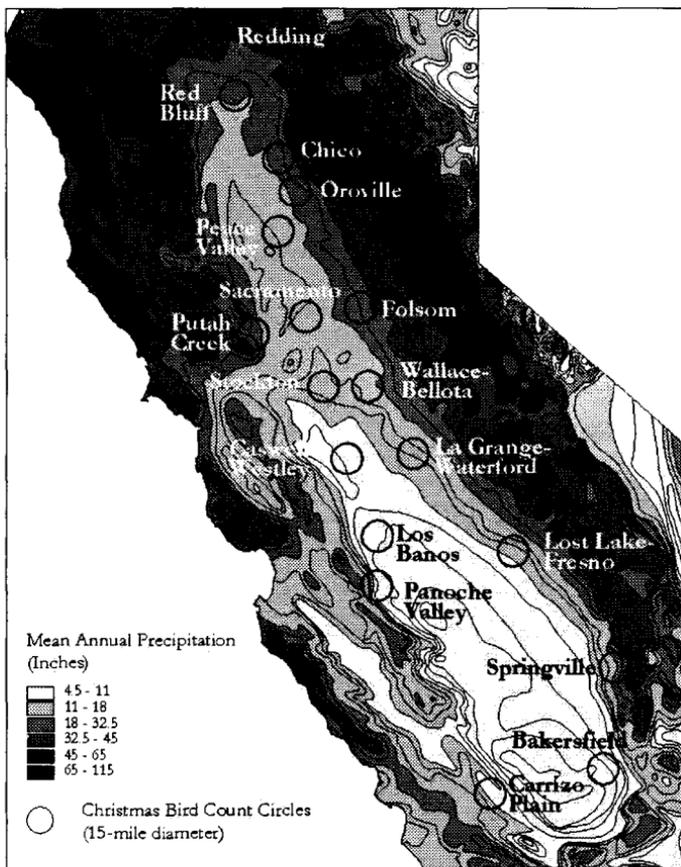


Figure 2. Mean annual precipitation from California Spatial Information Library ([http://www.gis.ca.gov/data\\_index.epl](http://www.gis.ca.gov/data_index.epl)).

### Precipitation

Annual mean precipitation was analyzed using data available from the California Spatial Information Library ([http://www.gis.ca.gov/data\\_index.epl](http://www.gis.ca.gov/data_index.epl)). These data are based on long-term mean annual precipitation measurements collected over a sixty-year period (1900-1960) by the U.S. Weather Service from approximately 800 precipitation stations in California. The data are portrayed as lines of equal rainfall (isohyets) and are grouped into ranges (Figure 2). We compared data for 15 CBCs that are located in areas that have an annual mean precipitation above 11 inches with 3 CBCs located in areas that have an annual mean precipitation below 11 inches. The 11-inch mark was selected because it can be used to graphically separate much of the Sacramento Valley from the San Joaquin Valley.

CBC Circle	Years Surveyed	Years Detected	High Count	Low Count	Median	Frequency of Detection
Bakersfield	15	15	32	1	9.0	100.0%
Carrizo Plain	15	13	59	0	3.0	86.7%
Caswell-Westley	13	0	0	0	0.0	0.0%
Chico	12	1	1	0	0.0	8.3%
Folsom	15	11	115	0	9.0	73.3%
LaGrange-Waterford	14	6	6	0	0.0	42.9%
Los Banos	14	3	14	0	0.0	21.4%
Lost Lake-Fresno	15	14	80	0	14.0	93.3%
Oroville	12	0	0	0	0.0	0.0%
Panoche Valley	13	11	30	0	8.0	84.6%
Peace Valley	15	10	7	0	2.0	66.7%
Putah Creek	15	11	25	0	5.0	73.3%
Red Bluff	15	0	0	0	0.0	0.0%
Redding	15	0	0	0	0.0	0.0%
Sacramento	14	6	6	0	0.0	42.9%
Springville	11	11	30	5	17.0	100.0%
Stockton	14	4	1	0	0.0	28.6%
Wallace-Bellota	12	6	10	0	0.5	50.0%

Table 1. Status of Vesper Sparrow on 15 selected Central Valley CBCs.

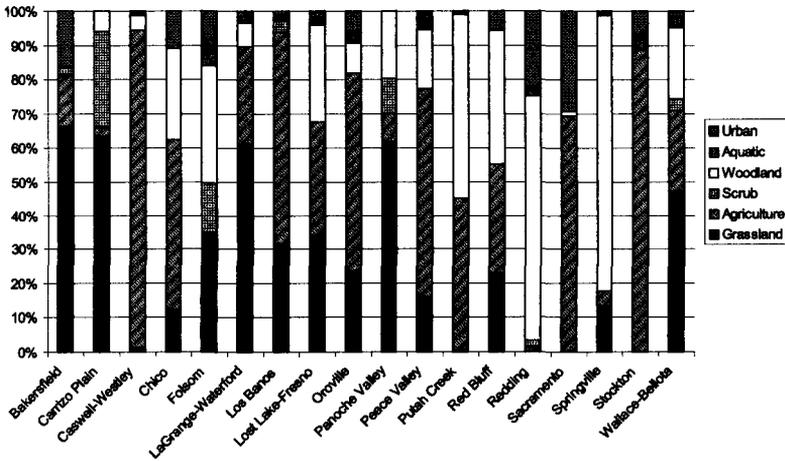
### *Vegetation*

Data from the Gap Analysis Program (GAP), available from the California Department of Fish and Game at <http://www.dfg.ca.gov/whdab/html/gap/html>, were used to identify vegetation types and land use within each CBC circle. Gap data include maps of existing natural vegetation that provide broad geographic information associated with the distribution of native wildlife species and natural communities. Natural habitat and/or land use types were combined into five major categories: urban, aquatic, woodland, scrub, agriculture, and grassland. The percent cover of each major category was determined for each CBC. The distribution and abundance of Vesper Sparrows for CBCs that had greater than 50% grassland coverage was compared against those with less than 50% (Figure 3). Because major wintering areas for Vesper Sparrows in California are known to include locations in the arid grasslands surrounding the San Joaquin Valley (Small, 1994), we predicted that they would be more abundant on CBCs that included higher percentages of grassland habitat in the circle.

## RESULTS

### *Elevation*

Vesper Sparrows were reported more frequently on valley-slope CBCs than valley floor counts. The average median for the 10 valley-slope counts was 6.5 versus 0.1 for the 8 valley floor counts. The frequency was 69% for valley-slope counts compared to 23% for valley floor counts. Among the valley-slope counts,



From GAP data (<http://www.dfg.ca.gov/wrdab/html/gap.html>)

Figure 3. Habitat and land use in Central Valley CBC circles.

only Redding and Chico, two of the northernmost CBCs in the Central Valley, had a median of zero. The only valley floor count that had a median not equal to zero was Wallace-Bellota with a median of 0.5.

### Precipitation

Vesper Sparrow numbers were similar when comparing CBCs circles that had a mean annual precipitation less than 11 inches versus those that included areas with an average mean precipitation above 11 inches. The three CBC circles located in areas that had an average mean precipitation of less than 11 inches (i.e., Caswell-Westley, Los Banos, and Bakersfield) had an average median count of 3.0 versus 3.9 for the 15 CBCs with an average mean precipitation of greater than 11 inches. The frequency for CBCs with less than 11 inches annual mean precipitation was 40%. The average frequency of detection for counts with greater than 11 inches was 50%.

### Vegetation

Vesper Sparrows were generally more abundant on CBCs that had a high percentage of grassland cover. The combined average median and frequency for the four CBCs with greater than 50% grassland (i.e., Bakersfield, Carrizo Plain, LaGrange-Waterford, and Panoche Valley) were 6.7 and 78%, respectively. The combined average median and frequency of detection for the 14 remaining counts were 2.4 and 35%, respectively. However, there were several noteworthy exceptions to this trend. For example, the Springville CBC had the highest median (i.e., 17) and 100% frequency, despite having less than fifteen percent grassland.

## DISCUSSION

Vesper Sparrows have been reported most frequently and in the greatest numbers on valley-slope CBCs located on the eastside of the San Joaquin Valley. These CBCs are most frequently in areas that have relatively low precipitation and a high percentage of grassland habitat. Vesper Sparrows were also reported regularly on CBCs in portions of northern California as far north as the Sutter Buttes in northern Sutter County (i.e., Peace Valley CBC). Vesper Sparrows appear to be absent, or nearly absent, in winter from the northernmost part of the Sacramento Valley (i.e., areas north of Chico).

Of the three factors considered in this analysis (i.e., elevation, precipitation, and vegetation), elevation appeared to have the most influence on Vesper Sparrow distribution and abundance. Vesper Sparrows were recorded much more frequently and in the greatest abundance on CBCs that included areas above the valley floor. Vesper sparrows were virtually unreported on CBCs that cover the lowest portions of the valley floor. Whether or not the lack of Vesper Sparrows reported on valley floor counts is directly related to elevation as opposed to a combination of environmental factors related to changes in elevation (changes in vegetation, land use, etc.) is beyond the scope of this analysis, but these factors almost certainly contribute to what attracts Vesper Sparrows to certain locations and deters them from others.

We did not establish a conclusive link between the distribution and abundance of Vesper Sparrows and changes in precipitation. Most of the highest Vesper Sparrow counts were recorded on CBCs in the San Joaquin Valley, which generally receives less rainfall. However, Vesper Sparrows were frequently absent on valley floor CBCs centered near the middle of the San Joaquin Valley (e.g., Los Banos and Stockton) even though these areas had low annual mean precipitation. Relatively high precipitation did not preclude the presence of Vesper Sparrows; they were reported in relatively large numbers on the Springville, Putah Creek, and Folsom CBCs even though these areas receive greater than 11 inches annual mean precipitation.

We did find evidence that CBC circles with high percentages of grassland habitat generally report higher frequency and abundance of Vesper Sparrow but this link was not conclusive. Vesper Sparrows tended to be more common on CBCs that had greater than 50 percent grassland coverage but some counts that had relatively low percentages of grassland habitat (e.g., Lost Lake-Fresno, Springville) regularly reported good numbers of Vesper Sparrows. Likewise, a high percentage of grassland habitat in a CBC circle did not necessarily result in more Vesper Sparrows being reported. The median for the LaGrange-Waterford CBC was zero despite having approximately 60% grassland habitat in the circle.

The results suggest that Vesper Sparrows may be most common on the east side of the San Joaquin Valley, particularly in the region that extends from Fresno County to Kern County. The CBCs with the three highest medians and frequency of detection were all located in this region (i.e., Springville, Lost Lake-

Fresno, and Bakersfield). The Springville count had the highest average median (i.e., 17), and only Springville and Bakersfield counts had a frequency of 100%. This region of the San Joaquin Valley is also the location of the highest single Vesper Sparrow count that we are aware of in the Central Valley. On 2 January 1997, John Sterling, John Luther, and Kristi Nelson conservatively estimated 600+ in about 4 miles of searching along the road in Yokohl Valley, east of Visalia in Tulare County (J. Sterling, pers. comm.).

Finally, we should note that because this analysis relied heavily on CBC data, the results should be viewed with caution. CBCs represent only a snapshot of the status and distribution of avifauna during late-December through early-January period for specific geographic areas and may not accurately represent the species regional status and distribution.

#### ACKNOWLEDGEMENTS

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#### LITERATURE CITED

Grinnell, J. and A. H. Miller. 1944. The distribution of the Birds of California. Pac. Coast Avifauna No. 27.

Sauer, J.R., S. Schwartz, and B. Hoover. 1996. The Christmas Bird Count Home Page. Version 95.1 Patuxent Wildlife Research Center, Laurel, MD.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company. Vista, California.

Rising, J. D, and D. Beadle. 1996. A Guide to the Identification and Natural History of the Sparrows of the United States and Canada. Academic Press, Inc. San Diego, California.

Zeiner, D. C., W.F. Laudenslayer, Jr., K. E. Mayer, and M. White, eds. 1990. California's Wildlife: Volume II: Birds. California Department of Fish and Game, State of California Resources Agency, Sacramento, CA.