Draft Avian Conservation Plan for the Sierra Nevada Bioregion:

Conservation priorities and strategies for safeguarding Sierra bird populations

A Project of California Partners in Flight and
Institute for Bird Populations

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Conservation Plan Authors:
Rodney B. Siegel
David F. DeSante
The Institute for Bird Populations
P.O. Box 1346
Point Reyes Station, CA 94956-1346
(415) 663-2051

Financial Contributors:
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TABLE OF CONTENTS

Figures

1. INTRODUCTION

This document is a draft avian conservation plan for the Sierra Nevada, produced for California Partners in Flight. The purpose of the draft plan is to summarize and analyze existing information on the status of Sierra bird populations, to identify major land management issues that may be threatening the security of those populations, and to suggest conservation actions to safeguard the populations and the habitats on which they depend.

Compared to other regions of California, the Sierra avifauna is still in relatively good condition, hosting only a handful of critically at-risk species (DeSante 1995). Evidence suggests, however, that many of the Sierra's more common bird species may be declining. The Sierra Nevada was recently identified as one of 233 ecoregions whose biodiversity is outstanding on a global scale; unfortunately it was also identified as one of the 110 of those ecoregions considered critical or endangered (Olson & Dinerstein 1998). Problems facing the Sierra biota include a legacy of destructive land management practices reaching back to the Gold Rush, many current land management practices that still urgently need revising, and rapid human population growth, with its associated increases in land conversion and resource-use pressures.

Covering approximately 1/6 of the state of California, the Sierra Nevada's diverse habitats are enormously important to the birds of California and, indeed, to a large portion of western North America's Neotropical migratory birds. The best way to protect Sierra bird populations, those that are already seriously jeopardized as well as those that are not, is to proactively safeguard the habitats on which they depend. Although we limit our discussion in this report to the status and conservation of birds, most of our conservation recommendations are habitat-based, and would consequently benefit other jeopardized taxa as well.

Conservation issues in the Sierra Nevada are complex, and remedial actions, which at times may have to be based on ambiguous scientific information, will affect many diverse interest groups. This document should therefore be viewed as a starting point for discussion of avian conservation efforts in the Sierra. For a bioregional conservation agenda to be successful, many diverse voices must participate in setting conservation goals, and in formulating politically viable strategies to meet those goals.

2. THE REGION

Geographic Scope

This conservation plan, along with its accompanying species accounts, addresses the avifauna of the Sierra Nevada, from the upper foothills of the Sierra on the west slope to the base of the Sierra escarpment on the east slope. Elevational limits are necessarily vague, as montane conditions extend farther downslope in river canyons and on north-facing slopes than along ridges, south-facing slopes, and wide, flat river valleys. Roughly speaking, the lower elevational limit of montane conditions on the west slope averages 1,000'-1,500'. Excluded, then, are the flat to rolling grasslands and agricultural lands where the western flank of the Sierra joins the Great Central Valley, as well as the wide riparian riverbottoms, oak savannahs, lower elevation blue oak woodlands, and lower elevation chaparral covered slopes of the lower foothills.

The lower boundary of the area covered by this report is better defined on the more abrupt east slope than on the west slope and corresponds to the eastern base of the Sierra escarpment. In the south, the escarpment may be as low as 3,000' to 4,000', in the north it ranges from 4,000' to 5000', and in the central portion of the east slope it may be as high as 6,000' to 7,000'. Excluded on the east side are the grasslands, pasture lands, and riparian areas of the major valleys and basins east of the escarpment, including Owens Valley, Long Valley, Mono Basin, Bridgeport Valley, lower Walker and Truckee valleys, Sierra Valley, and Honey Lake Basin. Also excluded are the flat or gently sloping expanses of sagebrush, bitterbrush, pinyon pine, and juniper that characterize the basin and range portions of the Great Basin that abut the Sierra, as well as the desert scrub flats and slopes where the northern Mojave Desert borders the eastern flank of the Sierra. Finally, Jeffrey pine covered highlands that reach the Sierra at a few high passes between eastside valleys and basins, such as Deadman Pass where the east flank of the Sierra joins Glass Mountain, are also excluded.

In the north, the Sierra Nevada blends nearly imperceptibly into the southern extension of the Cascade Mountains in the Mt. Lassen area. Mt. Lassen and all points north of it are excluded, however, because Mt. Lassen is clearly of volcanic origin, in common with most of the higher peaks of the cascades. In the south, the Sierra curves southwestward to join the Tehachapi Mountains that in turn join the Transverse Ranges of southern California. We have arbitrarily chosen the southern limit of the Sierra to be the upper south-facing slopes of the South Fork of the Kern River and the upper slopes north of Walker Pass in Kern County. The ecosystem of the Valley of the South Fork of the Kern River and the neighboring lower canyon slopes including Walker Pass has a decidedly desert flavor, with many species characteristic of the California deserts.

This area corresponds roughly to the 'Core Area' defined by the Sierra Nevada Ecosystems Project (1996), but is slightly more restricted. In keeping with a true "Sierra" management plan, we have excluded areas that would have added substantially more species, habitats, and associated management issues, but are not genuinely montane in character (e.g., eastside alkaline lakes, such as Mono Lake; broad eastside and westside valleys, such as Sierra Valley, Walker Valley, Owen's Valley; and the lower, Central Valley portions of most major west slope rivers, including the Feather, American, Tuolumne, San Joaquin and Kern).

State of Knowledge

DeSante (1995) synthesized information on the migratory status, distribution, abundance,

demographics, and risks faced by each of the 146 landbird species (excluding diurnal raptors and gallinaceous species) that constitute the breeding avifauna of the Sierra. That synthesis, edited to reflect more recent population and demographic data, is reproduced here in Appendix 1.

The fundamental patterns of distribution and overall relative abundance have been described fairly well for many of the more common species in the Sierra. Much of the existing information, however, disproportionately describes the avifauna of the mid-elevation zone of the central Sierra, during the warmer months of the year.

The winter ecology of much of the Sierra's birdlife is still poorly understood, including distributional questions (i.e., where do most of the Sierra's Williamson's Sapsuckers and Cassin's Finches spend the winter?), life-history/demographic questions (i.e., how much of the annual mortality of Sierra resident birds is effected during winter months?) and resource management questions (i.e., how do various forest management practices affect avian community structure and nesting success?).

The birds of the rugged east slope of the Sierra are less well known than those of the west slope, and both the northern and southern Sierra appear to be less well studied than the central Sierra. Recent work has filled many gaps in our understanding of birds of the high country, but many basic aspects of the distribution and ecology of Sierra birds at lower elevations of the west slope remain unresolved. The chaparral of the lower-elevation slopes is extremely important to the overall populations of several rare or uncommon species, including Black-chinned Sparrow, Rufous-crowned Sparrow, Sage (Bell's) Sparrow, and Lawrence's Goldfinch. Reliable Breeding Bird Survey (BBS) trend data do not exist for any of these species, which could be undergoing serious declines, with little possibility of detection.

Nocturnal species represent another formidable gap in basic ecological information. Although the Spotted Owl and Great Gray Owl have, deservedly, received considerable attention and study, the most basic aspects of the distribution and ecology of the Long-eared Owl and most small owls in the Sierra remain almost a complete mystery. Common Nighthawk is the only nocturnal species for which reliable BBS trend data in the Sierra exist.

Although the Breeding Bird Survey provides the best long-term data available on population trends of Sierra birds, the historically low number of BBS routes conducted in the Sierra hampers conclusive assessments of the population trends of most species. Recent efforts within the Forest Service to add additional BBS routes throughout the Sierra will go a long way toward ameliorating this problem in the future, but overall avian monitoring efforts are still far from adequate to provide a thorough understanding of how resource management activities and other anthropogenic processes in the Sierra impact bird populations.

Compiling basic data on distribution and abundance constitutes only a first step toward understanding the population dynamics of Sierra birds. Adequate stewardship of Sierra bird populations requires increased efforts and new initiatives to elucidate:

a) habitat-specific population trends,

b) the primary demographic parameters that drive those population trends,

c) effects of management practices on primary demographic parameters, and

d) the status of numerous species that are too rare or locally distributed to be effectively surveyed by existing monitoring efforts.

Conservation Opportunities/Conservation Challenges

Now is a time of both unprecedented opportunity for conservation efforts in the Sierra, and

increasingly difficult challenges. Resource managers and landowners throughout the Sierra are seeking more sustainable methods of resource extraction and are explicitly incorporating the conservation of biodiversity into resource management objectives. At the same time, population and recreational-use pressures are growing rapidly. The human population of the Sierra doubled between 1970 and 1990, resulting in extensive land conversion, and growth is expected to accelerate in the next decades (Duane 1996). Conserving the Sierra's biodiversity in the context of rapid population growth will be a major challenge of the coming years.

Several recent and current largescale efforts to assess the ecological condition of the Sierra and to revise management practices have been initiated, including the Sierra Nevada Ecosystem Project's (1996) four volume report to Congress, the USDA Forest Services's ongoing Sierra Nevada Framework for Conservation and Collaboration and associated efforts to amend the management plans of each of the Sierra's national forests, and the Sierra Nevada Forest Protection Campaign's (1999) recent volume of Sierra-wide management recommendations. We hope this report will build on those efforts, by exploring the implications of various land management issues on the Sierra's avifauna.

3. AVIFAUNA ANALYSIS

Methods

The extensive scope of this project requires that we take a 'broad-brush' approach to assessing the condition and needs of the Sierra avifauna. Readers interested in species-specific information are referred to the detailed species accounts in Appendix 1.

We analyzed population trend data from Breeding Bird Survey (BBS) routes located in the Sierra Nevada physiographic province. Droege (1990) and Peterjohn & Sauer (1993) provide detailed descriptions of BBS methodology and rationale. The BBS consists of a continent-wide array of roadside point-count transects, or routes. Each route is 39.4 km long, and comprises 50 3-minute point counts at 0.8 km intervals. Expert observers conduct point-counts once each year during the peak of the breeding season (June in the Sierra), recording numbers of every species detected within a 0.4 km radius.

BBS data have some important limitations. Reliable information is produced only for the more common species. Of the more than 150 bird species that constitute the complete Sierra's breeding avifauna (Gaines 1992, DeSante 1995), only 77 were detected frequently enough on BBS routes between 1966 and 1996 to produce meaningful population trend estimates. The population status of rarer Sierra species, indeed, many of the species that are most likely to be in jeopardy, therefore cannot be evaluated using BBS data.

Additionally, BBS data are problematic because point counts are conducted exclusively at roadsides, which often include a large proportion of fragmented and edge habitats, and may not be representative of the larger habitat matrix. The result may be biases in the kinds of species that are detected, and in the number of individuals of some species counted (O'Connor 1992, DeSante & George 1994). Despite these shortcomings, BBS data provide the most extensive, long-term data set available on landbird population trends, and are a tremendously valuable resource for conservation planning.

We used the Interactive Route Regression Module provided on-line by the USGS Patuxent Wildlife Research Center to estimate population trends for the BBS Sierra Nevada physiographic province (stratum 66), from the inception of the BBS program in 1966 up through 1996. Unfortunately, the BBS has arbitrarily defined the Sierra Nevada physiographic province to encircle the north end of the Sacramento Valley, including the southern Cascades, and the Trinity Alps. Our analysis consequently includes four routes (of a total 17 routes) that are actually located outside the Sierra Nevada as it is defined for this conservation plan. We can only hope that the inclusion of these data does not substantially bias trend calculations for the Sierra.

Province-wide trends were calculated as a weighted average of individual route trends, using the estimating equations estimator described in Link and Sauer (1994). The estimator model incorporates observer effects to prevent bias associated with changes in observer quality (Sauer et al. 1994).

BBS personnel suggest that a species must be detected on at least 14 different routes to provide enough data to reliably assess it's regional populations trend. Because a maximum of only 17 routes were surveyed in the Sierra during the years under consideration, relatively few species met this threshold. To provide a meaningful framework for analyzing BBS population data, we consequently classified populations trends according to the system presented in Table 1. Species that were detected too infrequently to reach even the 'increasing tendency', 'decreasing tendency', or 'stable tendency' thresholds were excluded from the analysis.

We also used mark-recapture data gathered between 1992 and 1997 as part of the Monitoring Avian Productivity and Survivorship (MAPS) program (DeSante et al. 1995, 1998, Burton and DeSante 1998). The MAPS program collects bird-banding data from over 500 stations across the North American continent, adopting a 'constant-effort' mist-netting method to index productivity and using mark-recapture techniques to estimate survivorship of landbirds. Bird-banding teams at each station run approximately 10 mist nets within the central 8 ha of a 20-ha plot for six hours following sunrise. Each station is visited on one day within each of 7-8 sequential ten-day periods throughout the breeding season (May 21 or May 31 [depending on altitude] to August 8 in the Sierra). Remote sensing of habitat patterns in the vicinity of each station in conjunction with on-ground spatial habitat assessment and local climate data forms the basis of a geographical information system (GIS) for the MAPS program (MAPSIS). This system is used to identify habitat patterns (at a variety of spatial scales) that are associated with declining (or increasing) population trends caused by low (or high) productivity or survivorship for target species.

Results

Seventy seven species were detected frequently enough to allow the calculation of Breeding Bird Survey population trends estimates (Appendix 1). The trend classifications of these 77 species are presented in Table 2. Overall, 40 species (51.9%) exhibit negative trends, 18 species (23.4%) exhibit positive trends, and 19 species (24.7%) exhibit stable trends. Of the 58 species exhibiting either positive or negative trends in the Sierra, significantly more appear to be declining than would be expected due to chance alone (Binomial Test, $P < 0.05$). Table 3 lists only those species whose Sierra population trends are statistically significant, at various thresholds. Overall, 18 species show significantly decreasing trends, compared to only 4 species with significantly increasing trends; again, this preponderance of declining species differs significantly from the distribution expected by chance (Binomial Test, $P < 0.01$).

Dependence on particular habitats

Species dependent on a few critical habitats within the Sierra appear disproportionately likely to exhibit decreasing trends. These habitats include montane meadows, non-meadow riparian habitat, late successional/old growth forest, and oak woodland.

Montane meadows -- Based on the species accounts in Appendix 1, we compiled lists of a) species that critically depend on Sierra montane meadows for at least a portion of their life cycle (Table 4) and b) species that are strongly associated with montane meadows, but do not necessarily critically depend upon them (Table 5). Of the 37 species on the combined lists, 13 are inadequately sampled by the BBS to allow the calculation of a population trend. Among those 13 are two California Endangered Species (Willow Flycatcher and Great Gray Owl) and a California Bird Species of Special Concern (Vaux's Swift) (Comrack 1992). Of the 24 species with adequate BBS data to calculate population trends, 6 are stable, 14 are decreasing, and 4 are increasing (Fig. 1); the preponderance of decreasing species is statistically significant (Binomial Test, $P < 0.05$; Fig. 2).

Non-meadow riparian habitat -- Thirteen of the meadow-dependent species in the Sierra are also dependent on non-meadow riparian habitat. They include Long-eared Owl, Belted Kingfisher, Black Phoebe, Warbling Vireo, Tree Swallow, Northern Rough-winged Swallow, House Wren, Swainson's Thrush, Yellow Warbler, MacGillivray's Warbler, Wilson's Warbler,

Song Sparrow, and Lazuli Bunting. An additional 16 non-meadow species are dependent on non-meadow riparian habitat in the Sierra, although many of these occur primarily in the lower foothills of the Sierra. These 16 species include Great Blue Heron, Wood Duck, Harlequin Duck, Common Merganser, Red-shouldered Hawk, Killdeer, Spotted Sandpiper, Black-chinned Hummingbird, Downy Woodpecker, Pacific-slope Flycatcher, Winter Wren, American Dipper, Yellow-breasted Chat, Black-headed Grosbeak, Blue Grosbeak, and American Goldfinch. Of the 14 of these combined 29 species with adequate data to calculate population trends, 5 are stable, 6 are decreasing, and 3 are increasing. We refer the reader to Riparian Habitat Joint Venture (1998) for an extensive analysis of the status of riparian-dependent birds throughout California.

Late successional/old growth forest -- We used data from the California Wildlife Habitat Relationships Database system (California Department of Fish and Game 1994) to compile lists of a) species whose population viability in the Sierra requires late successional/old growth (LS/OG) forest habitats (Table 6), and b) species that use LS/OG habitat, but whose populations do not critically depend on it (Table 7). The combined lists comprise 34 species, 14 of which are inadequately sampled by the BBS to calculate population trends. Once again, some of the most high-risk species (i.e., Northern Goshawk and Spotted Owl) are those that are lacking in BBS data. Of the 20 species with calculable population trends, 5 are stable, 4 are increasing, and 11 are decreasing (Figure 3). The ratio of decreasing to increasing species is skewed heavily toward decreasing species, but does not quite reach the threshold of statistical significance (Binomial Test, $P > 0.05$, Fig. 4).

Oak woodlands -- We used the species accounts in Appendix 1 to compile lists of a) species that critically depend on the Sierra's oak woodlands (Table 8) and b) species that are strongly associated with oak woodland, but do not necessarily depend critically upon it (table 9.) Of the 30 species on the combined lists, 11 are insufficiently sampled by the BBS to produce reliable population trends. Three of the remaining species have population trends that are stable, 4 have increasing trends, and 13 have decreasing trends (Fig. 5). The ratio of decreasing trends to increasing trends departs significantly from that expected by chance (Binomial Test, $P < 0.05$; Fig. 6).

Problems in the Sierra Nevada or on the wintering grounds?

Observed declines of Sierra bird populations could be due to diminished productivity and/or survival in the Sierra, or to reduced survival on the wintering grounds or along migratory routes, at least for migratory species. To help distinguish between these two possibilities, we assessed migratory status as a predictor of population trend direction.

DeSante (1995; Appendix 1) classified the migratory status of each Sierra bird species as either resident (R), resident/short-distance migrant (R-SDM), short-distance migrant (SDM), short-distance migrant/Neotropical migrant (SD-NTM), or Neotropical migrant (NTM), according to the system in Table 10. Within each migratory status classification, we tallied the number of species (of the 77 species with calculable trends) that were increasing (including everything from 'increasing tendency' to 'definitely increasing'), stable (including everything from 'stable tendency' to definitely stable'), or decreasing (including everything from 'decreasing tendency' to 'definitely decreasing'). If problems driving the apparent decreases in Sierra bird populations were primarily encountered on the wintering grounds of migratory species, we would expect strictly resident birds to include relatively fewer species with decreasing trends than would migratory birds. Figure 7 shows that this is not the case; over 61% of strictly resident species with calculable trends show

decreases, compared to only about 42% of Neotropical migrants. If anything, resident birds appear to be faring worse than Neotropical migrants, suggesting that pervasive ecological problems may be affecting productivity and/or survival rates within the Sierra. Patterns of population trends exhibited by the three classes of short-distance migrants are difficult to interpret. Resident/short-distance migrants include the lowest proportion of decreasing population trends (33.3%), while short-distance migrants account for the highest proportion of decreasing trends (65.0 %). We obtained similar results when we considered only the 50 species with 'definite', 'likely', or 'possibly' trend classifications, as well as to only the 26 species with 'definite' or 'likely' trend classifications, and to only the 16 species with 'definite' trend classifications.

In order to create categories with adequate sample sizes for performing binomial tests, we further aggregated migratory status classifications into three broad categories: 1) resident or resident/short-distance migrant (R/R-SDM), 2) short-distance migrant or short-distance/Neotropical migrant (SDM/SD-NTM), and 3) Neotropical migrant (NTM). We then tallied the species with decreasing and increasing Sierra-wide trends in each category (Fig. 8), again assuming that non-stable trends should be equally distributed between decreasing and increasing species.

Among both R/R-SDM and NTM species, this was indeed the case; more species exhibited decreasing than increasing trends, but the distribution was not significantly different than that expected due to chance (Binomial Tests, $P > 0.05$). SDM/SD-NTM species, however, were dramatically more likely to be decreasing than increasing (Binomial Test, $P < 0.005$). Again, similar results (significantly more decreases than increases for SDM/SD-NTM species; more, but not significantly more, decreases than increases for R/R-SDM and NTM species) were obtained when we considered only 'definitely', 'likely', or 'possibly' trends; 'definitely' and 'likely' trends only; or 'definitely' trends only. Although much concern has been raised about declining populations of Neotropical migrants throughout North America, BBS trend data suggest Neotropical migrants are faring no worse in the Sierra than other species. Rather, short-distance migrants seem to be at the greatest risk. These results agree with Hutto (1988), who questioned the decline of Neotropical migrants wintering in western and southern Mexico, and with DeSante and George (1994) who found that Neotropical migrants generally showed fewer and smaller decreasing trends than short-distance migrants throughout the western United States.

These results should not be interpreted as indicating that problems do not exist among Neotropical migrants, nor that tropical deforestation is not a problem for some migratory Sierra birds, but merely that gross generalizations regarding massive declines of Neotropical migrants in western North America in general, and the Sierra Nevada in particular, may be unfounded. More importantly, more attention should be focused on problems the Sierra's short-distance migrants may be encountering on their wintering grounds in southern California Arizona, and northern Mexico. Finally, the relatively high proportion of decreasing population trends in all categories, particularly among strictly resident birds, suggests that pervasive productivity and/or survivorship problems may exist within and throughout the Sierra.

Can decreasing population trends be linked to land management practices?

The design of the BBS monitoring system makes correlating population trends with land management practices virtually impossible. Point count transects that are 34.9 km long generally pass through lands that include widely differing habitat types, let alone management regimes. Once

data from the various points along each transect are combined (which is necessary to amass an adequate sample size for trend detection), adequate resolution for correlating abundance data with land management practices (or even habitat types) is necessarily lost.

Standardized, constant-effort mist-netting data from the MAPS program may provide bird population indices for more circumscribed areas than BBS routes, and therefore provide the potential for linking specific land management regimes to their consequences for local bird populations. Additionally, MAPS data provide information on primary demographic parameters, so that observed population changes can be attributed to changes in either productivity, survival, or both. We used data from 12 Sierra Nevada MAPS stations operated between 1992 and 1997 to investigate whether observed population declines may be linked to Sierra land management practices. Five of the stations were located in Yosemite National Park, and seven were located on or adjacent to the Tahoe National Forest. Stations in the two areas, which are were mostly located along the edges of montane meadows, spanned roughly equivalent elevational gradients. Station elevation averaged 1,804 m in Yosemite (minimum elevation = 1,311 m; maximum = 2,402 m) and 1,887 m in the Tahoe area (minimum elevation = 1,494 m; maximum = 2,042 m).

We compared productivity indices (per cent of the catch comprised of juveniles) by combining capture data within each of the two sets of stations. Adequate data existed to calculate productivity at both sets of stations for 22 species (Fig. 9). Sixteen of the 22 species (73%) had higher productivity indices in Yosemite than at Tahoe; of the 16 species whose productivity indices from the two sets of stations differed by 10% or more, 12 (75%) had higher productivity in Yosemite. Of considerable interest is the a fact that 14 out of 16 species (88%) with higher productivity indices in Yosemite National Park than on the Tahoe National Forest are meadow or late successional/old growth dependent species, while only 3 out of 6 species (50%) with higher productivity on the Tahoe than in Yosemite are meadow or LS/OG dependent species.

We believe that this preponderance of higher productivity indices at the Yosemite stations may reflect differences resulting from land management regimes at and around the two sets of stations. Despite decades of fire suppression efforts and some historical grazing, forest stands and meadows in the Sierra's national parks are still probably more similar to their pre-European settlement conditions than forest stands and meadows in the national forests, which have often been subject to heavy grazing and logging pressures. While inconclusive, this comparison of indices strongly suggests a problem of diminished productivity on the historically more heavily managed lands of the Tahoe National Forest.

4. PRIORITY HABITATS FOR CONSERVATION

Based on the species accounts in Appendix 1, our avifauna analysis, and other information, we identified the following habitats as top conservation priorities within the Sierra Nevada: montane meadows, non-meadow riparian habitat, late successional/old growth forest and oak woodland. Although montane meadows are sometimes included with streamside vegetation in more general discussions of 'riparian' habitat, we believe that the critical role that Sierra montane meadows play in supporting numerous Sierra bird species (many of which are not normally associated with other types of riparian habitat) merits treating them as a separate habitat category.

In the following sections we identify and briefly summarize major land management issues affecting each of the top priority habitats. The summaries are not intended to be exhaustive; fully addressing the complexity of each issue, and even thoroughly summarizing the relevant literature is beyond the scope of this project. Rather, our more limited objectives are to identify those land management issues that are most likely to affect the security of Sierra bird populations, and to point the reader toward more detailed discussions of the issues.

PRIORITY HABITAT 1: MONTANE MEADOWS

Montane meadows are a distinct type of riparian plant community, generally dominated by sedges, but also including rushes, grasses and forbs. Whether or not surface water is present, high ground water excludes most plant species (Kattelman and Embury 1996), even in meadows that are generally classified as 'dry' (Whitney 1979). Sierra meadows range in size from just a few square meters to several square kilometers (Allen 1987), and most commonly occupy glaciated subalpine zone basins, although smaller numbers of meadows are found all the way down to 1,200 m in the northern part of the mountain range, and 1,800 m in the south. Montane meadow habitat is extremely important to the Sierra avifauna. Not only do numerous species depend on montane meadows for breeding habitat, but meadows also serve as important supplemental habitat for many species that breed in other habitats; examples include Red-breasted Sapsucker, which utilizes willows in montane meadows for a steady supply of sap during the breeding season, and several finch species which require a daily water supply (DeSante 1995). Additionally, montane meadows provide critical molting and pre-migration staging areas for juveniles and adults of a broad array of Sierra landbird species, many of which also do not actually use meadow habitat for breeding. For some of these species, such as Orange-crowned and Nashville Warblers, montane meadows in mid-summer may be the single most critical Sierra habitat requirement (DeSante 1995). Finally, the population densities of many forest-inhabiting species are often highest near meadow edges, even if the birds rarely or never actually venture into the meadows (DeSante 1995).

Historic and current human activities, particularly livestock grazing, have compromised the viability of meadow habitat for birds in many parts of the Sierra Nevada. Severe overgrazing between the late 1800s and about 1930 heavily impacted Sierra meadows, resulting in accelerated erosion and massive gullying (reviewed in Menke et al 1996, Kattelman and Embury 1996). Although the worst abuses were halted, Sierra meadows were still heavily grazed up until the 1970s, when the Forest Service began to take a more ecologically oriented approach to range management. Although conditions have subsequently improved, the continuing presence of large livestock herds in many areas continues to impact meadow ecosystems today.

California's Endangered Species list includes two meadow-dependent birds, Willow Flycatcher and Great Gray Owl, and cattle grazing has been implicated in the decline of each

(Serena 1982, Harris et al. 1987, Gaines 1988, Harris et al. 1988, Ohmart 1994, Graber 1996). Willow Flycatchers avoid nesting in the lowermost foliage of willows that have been denuded by cattle grazing (Duff 1979, Gaines 1988, Fowler et al. 1991). Great Gray Owls depend on meadow vole populations, which livestock grazing can reduce (USFWS 1980, Hanley and Page 1982, Kauffman et al. 1982, Winter 1986, Kie 1991, Greene 1995). Additionally, Great Gray Owls may be excluded from foraging in grazed meadows by Great Horned Owls, which apparently prefer grazed meadows (Gaines 1992).

More generally, improper grazing practices have a variety of effects on meadows that are ultimately deleterious to many Sierra bird species. In addition to trampling nests (Skovlin 1984), livestock grazing can reduce herbaceous vegetation cover, making habitat unsuitable for many riparian birds that are fairly sensitive to changes in complexity and density of vegetation structure (Dobkin 1994). Moreover, many meadow-associated bird species depend upon invertebrate prey that in turn require herbaceous plants for sustenance. Reduced herbaceous plant cover consequently may result in reduced food resources for birds. Heavy grazing over many years can also prevent shrub and tree regeneration, eliminating essential nesting and foraging habitat (Skovlin 1984).

Improper grazing practices reduce vegetation cover and alter vegetation composition (Holechek et al. 1989). They can also cause soil compaction and damage the banks of streams, resulting in increased channelization and a general drying out of meadows, and ultimately, hasten forest encroachment (Odion et al. 1990, Ohmart 1994, Kattelmann and Embury 1996**,** Menke et al. 1996). Such problems are widespread throughout Sierra meadows (DeBenedetti and Parsons 1979, Ratliff 1985, Hagberg 1995, Moyle 1996).

Finally, the presence of cattle in montane meadows may attract cowbirds, which parasitize nests of many bird species in the surrounding forest (Verner and Ritter 1983, Rothstein et al.1980, Rothstein et al. 1984, Laymon 1987, Graber 1996). Although BBS data indicate that Brown-headed Cowbirds may be declining in the Sierra, nest parasitism is still an important issue, especially for the most vulnerable species, which are generally riparian-dependent (Airola 1986).

For all of these reasons, poorly managed grazing in riparian areas can reduce nesting densities of many bird species (reviewed by Fleischner 1994, Saab et al. 1995), particularly of habitat specialists such as Willow Flycatcher, Lincoln's Sparrow and White-crowned Sparrow (Knopf et al. 1988).

Other human activities in the surrounding watershed can also contribute to the gradual drying out of meadows. Examples include road construction (often related to forestry activities) and deforestation associated with logging, both of which can result in increased water runoff and consequent downstream channel incision. As meadow stream channels become incised, the surrounding water table is lowered, and flood events capable of inundating the surrounding meadow become increasingly rare. Substantial changes in vegetation, including loss of woody riparian vegetation (i.e., willows and alders), forest encroachment, and sweeping changes in graminoid community composition can then result.

PRIORITY HABITAT 2: NON-MEADOW RIPARIAN HABITAT

The loss and degradation of riparian habitats have been implicated as key factors in population declines of western North American landbirds (Terborgh 1989, DeSante and George

1994, Ohmart 1994). As in other regions, riparian zones in the Sierra are crucial to the numerous bird species that utilize them for breeding, to many additional species which depend on them as migration stopover areas, and even to many species of upland-dwelling birds, whose populations densities are often elevated adjacent to riparian areas (Carothers 1977). Riparian areas have been identified as the single most critical habitat for avian conservation across California (Miller 1951, Manley and Davidson 1993, Riparian Habitat Joint Venture 1998). Because of a) the critical importance of riparian habitat to numerous Sierra species, and b) the extensive anthropogenic modification of Sierra riparian areas, riparian habitat should be considered a high-priority habitat within the Sierra Nevada.

Because of it's narrow, linear configuration, riparian habitat in the Sierra occupies a very small proportion of the overall landscape— estimates vary considerably depending on the particular criteria used for delineation, but all sources place the value at well under 5% (reviewed in Kattelman and Embury 1996). Davis and Stoms (1996) estimate that riparian forest and riparian scrub cover a total of approximately 59 km^2 and 119 km^2, respectively, in the Sierra (as delineated by the Sierra Nevada Ecosystems Project).

Surprisingly little attention has been paid to Sierra riparian ecology in the scientific literature (reviewed in Kondolf et al. 1996), with even fewer studies directly addressing the Sierra's riparian avifauna. This is unfortunate because riparian corridors throughout the Sierra are badly in need of conservation and restoration measures. A recent aerial survey indicated that extensive loss and fragmentation of riparian vegetation is common along most Sierra riparian corridors, especially at lower elevations (Kattelman and Embury 1996).

Kondolf et al. (1996) and Kattelman and Embury (1996) exhaustively review major human impacts on riparian areas in the Sierra, and conclude that the most prevalent present-day causes of riparian habitat loss and fragmentation are road and railroad crossings, timber harvesting, clearing of private lots/urbanization, water diversion for hydroelectric generation or irrigation, livestock grazing and inundation for reservoirs.

The California Partners in Flight Riparian Habitat Conservation Plan (Riparian Habitat Joint Venture 1998) provides an extensive discussion of important riparian habitat conservation issues, and should be referred to for more detailed information.

PRIORITY HABITAT 3: LATE SUCCESSIONAL/OLD-GROWTH FOREST

The aerial extent of late successional/old growth (LS/OG) forest, as well as overall structural complexity throughout the low- to mid-elevation forest belts, has been greatly reduced by past and present logging practices and human-altered fire regimes (Franklin and Fites-Kaufmann 1996). In their extensive assessment of the status of LS/OG forest in the Sierra, Franklin and Fites-Kaufmann reach several major conclusions, reproduced below:

1. There is relatively little high-quality late-successional forest remaining in the Sierra Nevada, particularly in the commercial forest zones.

2. Commercially important forest types— such as the westside mixed-conifer and eastside pine forests— are most deficient in high-quality late-successional forest relative to their potential and to presettlement conditions.

3. Key structural features of the late-successional forests— such as large diameter trees, snags, and logs— are generally at low levels in the forests of the Sierra Nevada.

4. On the positive side, the forest cover of the Sierra Nevada is relatively intact and most

forest stands have sufficient structural complexity to provide for at least low levels of late-successional forest function...[However] while forest continuity is high in the Sierra Nevada, as noted above, the forest structure has been greatly simplified relative to presettlement conditions so that the forests do not provide the same level of wildlife habitat and other ecological functions characteristic of high quality LS/OG forests.

5. National parks provide the major concentrations of high-quality late successional forests, especially at the landscape level, and on a percentage basis, have about twice as much highly rated forest [LS/OG characteristics] as adjacent national forests.

6. Much of the highly-ranked late-successional forest on national forest lands is unreserved and potentially available for harvest.

These changes in LS/OG habitat availability, particularly the loss of LS/OG forest characteristics such as large trees, abundant snags, and large downed logs, have placed many high-profile LS/OG dependent bird species such as Spotted Owl, Northern Goshawk and Great Gray Owl at risk, along with several LS/OG dependent mammals, including fisher, American marten, Sierra Nevada red fox, and wolverine (Verner et al. 1992, Powell and Zielinski 1994, Graber 1996). Effects on numerous lower-profile species are poorly known.

Reduction in the aerial extent of LS/OG forest in the Sierra reflects pervasive changes in forest structure throughout the Sierra since the mid- 19th century. Timber harvest practices and fire suppression have reduced the frequency of low-intensity fires, reduced the number of large trees, increased the density of smaller, understory trees, and possibly reduced the extent of shrub cover and the density of snags (Weaver 1974, Vankat and Major 1978, Parsons and DeBenedetti 1979 McKelvey and Johnston 1992, Andrews 1994, Hejl 1994, Chang 1996, Franklin and Fites-Kaufmann 1996). Suppression of surface fires, in particular, also affects forest community composition, favoring the recruitment of white fir over pines and black oak (Agee et al. 1978, Husari 1980, Chang 1996). Gradual conversion to white fir-dominated stands is consequently in progress across much of the Sierra (Parsons and DeBenedetti 1979, Bonnicksen and Stone 1982, van Wagtendonk 1985, Weatherspoon et al. 1992). All these changes in forest structure and composition have surely had far-reaching effects on avian community composition (Beedy 1982, Raphael and White 1984, Raphael et al. 1987, Hejl 1994), although adequate data for reconstructing those effects are lacking.

Another, more indirect effect of fire suppression practices may be a gradual loss of habitat diversity throughout Sierra forests. The accumulation of downed logs and other fuel that has resulted from fire suppression, along with the increasingly dense understory, have made large, high-severity crown fires more common (Andrews 1994). Such large, intense fires typically kill vegetation over broad areas, ultimately increasing homogeneity and patch sizes within affected forests (Weatherspoon et al. 1992, Andrews 1994, Skinner and Chang 1996). The long-term result is a less diverse forest, capable of supporting a less diverse avifauna.

PRIORITY HABITAT 4: OAK WOODLANDS

The human population of the Sierra Nevada doubled between 1970 and 1990, with 40% of that growth occurring in the foothill zones of Nevada, Placer and El Dorado Counties (Duane 1996). Human population is predicted to increase three-fold between 1990 and 2040, with the land area developed for human settlement increasing four-fold (Duane 1996). This rapid land conversion presents an obvious threat to the whole suite of species dependent on foothill blue oak woodlands.

Equally important to numerous bird species for nesting and roosting (as well as acorn-dependent species) are the oaks of the lower conifer zone (black oak, canyon oak, interior live oak, and tanoak). Although urbanization is not as much of a threat in this zone as in the blue oak elevational belt, both blue and black oaks have shown alarmingly poor recruitment throughout the last half century, possibly as a result of fire suppression (McClaran and Bartolome 1989, Chang 1996). Patterns of oak distribution and abundance prior to European settlement are believed to have been actively maintained through extensive use of low-intensity fires by native Americans **(**Anderson 1993, Anderson and Moratto 1996). Without a dramatic change in fire regimes, it has been suggested that black oak habitat in the Sierra will eventually occupy only a small fraction of its current distribution (McDonald 1990), with dire consequences for oak-dependent birds.

5. CONSERVATION RECOMMENDATIONS

MONTANE MEADOWS

Objective 1. Safeguard existing high-quality meadow habitat throughout the Sierra.

Recommendation 1-1. Use a standardized methodology to identify meadows throughout the Sierra that are particularly valuable to breeding, dispersing, and migrating birds.

Initial lists of a tractable number (30-50?) candidate meadows for top-priority conservation status within each of the Sierra's national forests and national parks, as well as additional meadows on privately held lands, should be produced using GIS and other existing data. Depending on available data, criteria for candidacy could include elevation, size, presence and extent of surface water, presence and size of willow thickets, per cent cover of the surrounding forest, or remoteness from other candidate meadows. Current Forest Service efforts to model potential Willow Flycatcher habitat may produce additional criteria.

Once lists of candidate meadows have been developed, a standardized, rapid field methodology should be implemented to survey each candidate meadow. The Institute for Bird Populations has recently developed such a protocol, and has implemented it in portions of the southern Sierra.

Several different criteria should then be considered in selecting surveyed meadows for top-priority conservation status, including:

a) presence of species of management concern,

b) particularly high species richness and/or relative abundance of breeding bird species,

c) high concentrations of dispersing juveniles (these data can be standardized with respect to seasonal timing and elevation by comparison with analogous data from Sierra MAPS stations operated each summer for many years at varying elevations), and

d) geographical remoteness from other high-quality meadows.

Recommendation 1- 2. Confer formal protection status on high-priority meadows.

A proactive, Sierra-wide strategy for safeguarding meadow habitat is necessary to ensure the long-term viability of populations of many vulnerable meadow-dependent Sierra bird species. We suggest conferring Important Bird Area (IBA) status on a Sierra-wide network of meadows, including the 12 to 18 highest priority meadows within each administrative unit (national park or national forest) and additional meadows on privately held lands. All these meadows would be included in a Sierra Meadows Important Bird Area (IBA).

The IBA approach has been found to be an effective habitat management and conservation tool, and has been widely adopted around the world. The International Council for Bird Preservation (now Birdlife International) started the program in the mid-1980s as a comprehensive approach to encouraging conservation of sites that provide essential habitat to vulnerable or endemic species, or unusually large concentrations of birds. The program has been enormously successful, with over 3,000 IBA sites designated worldwide, and numerous sites throughout the United States. The IBA strategy has been explicitly endorsed by Partners in Flight, and was recently codified into New York state law.

IBA designation would not necessarily exclude management activities such as livestock

grazing, but it would require that any such activities be consistent with the IBA's primary goal of maintaining high-quality bird habitat. The IBA designation would carry no legal weight, but would serve to remind land managers and resource users of the meadows' critical importance to Sierra birds.

Members of the US Forest Service's Sierra Nevada Framework for Conservation and Collaboration EIS team have recently expressed an interest in incorporating a formal meadow reserve network into the revised management plans for the Sierra's national forests. Such an approach would likely have even stronger impacts on meadow management practices than would an IBA system, and should be encouraged. Regardless of which system of protection is adopted, designated meadows should be managed explicitly to maintain populations of meadow-dependent birds.

Recommendation 1-3. Use existing information to develop and implement management prescriptions for protected meadows.

A 'toolbox' of possible strategies for reducing the deleterious effects of various human activities on montane meadow ecosystems should be produced by searching and synthesizing the vast published literature and consulting with range management experts. Strategies should focus primarily on lessening the negative impacts of livestock grazing, but the effects of all relevant land management practices should also be reviewed. A resulting summary of meadow management alternatives could form the basis of the management prescriptions for the designated IBA meadows, and would also be extremely useful to managers of montane meadow habitat throughout western North America. The summary should be made widely available to public and private land managers.

Subsequent to field assessments and selection of IBA meadows, an initial set of management prescriptions should be formulated for each of the designated IBA meadows, in conjunction with the appropriate land holders/land managers. Prescriptions should be specific to each meadow and should be based on the 'toolbox' of options described above. Most importantly, prescriptions must be acceptable to land holders/land managers, so that they will actually be implemented.

Recommendation 1-4. Monitor the effectiveness of the management prescriptions implemented on the protected meadows and, if necessary, modify the prescriptions and implement them in an adaptive management framework.

It is crucial that the management prescriptions implemented on the protected meadows can be demonstrated to be effective at safeguarding the avian resources of the meadow. This is important because the management prescriptions implemented will likely tend to reduce the extent of certain other activities, such as livestock grazing, extraction of wood products, and construction of roads, on and immediately adjacent to the protected meadows. This can be accomplished by monitoring the populations of breeding and dispersing birds in the protected meadows and comparing these populations to those in paired control meadows on which management prescriptions are not implemented. For optimal results, monitoring and management should be linked within a research framework; this is the essence of adaptive management (Holling 1978, Noss and Cooperrider 1994).

Recommendation 1-5. Focus research efforts on the effects of different livestock grazing practices

on the abundance, diversity, and nesting productivity of meadow-dependent birds. Although adequate scientific information currently exist to formulate preliminary meadow management guidelines, hypothesis-driven research on the effects of specific land management practices on meadow avifauna are badly needed. In particular, research should focus on ways of reducing potentially harmful effects of livestock grazing and other management practices.

Objective 2. Restore degraded meadows to enhance their value for breeding, dispersing, and migrating birds.

Recommendation 2-1. Encourage landholders (public and private) and resource users to incorporate avian habitat needs into management practices on all meadows, not just those with formal protection status.

Management guidelines based on the best available information (see Recommendation 1-3) should be made widely available to Sierra land managers (both public and private). Concise, easily accessible information, combined with a vigorous outreach campaign, should encourage land managers of meadows *not* included in the IBA to factor the needs of Sierra birds into their management decisions as well. Because meadows are considered more responsive to changes in management and reductions in grazing intensity than any other type of range ecosystem (Menke et al. 1996), even relatively minor changes in management practices may produce important benefits for meadow-dependent birds.

Recommendation 2-2. Where feasible, promote active restoration of meadows, including re-vegetation and restoration of natural hydrologic processes, in an adaptive management framework.

Recent advances in stream restoration suggest that even deeply incised meadow streams can be successfully altered to restore natural flooding regimes to unnaturally dried-out meadows (Jim Wilcox, pers. comm.). This is especially true where stream incision and associated drying of meadows primarily reflect the effects of past, rather than current land management practices. Meadow restoration projects, incorporating hydrologic as well as vegetative restoration, should be encouraged on public and private lands throughout the Sierra. To maximize the benefits from revegetation and restoration efforts, their effectiveness must be monitored and the protocols and techniques modified in an adaptive management framework. A twofold approach to such monitoring is useful and involves: (1) monitoring breeding and dispersing bird populations in such meadows before and after revegetation and restoration efforts; and (2) monitoring revegetated and restored meadows and paired control (unrestored) meadows.

NON-MEADOW RIPARIAN HABITAT

The 14 comprehensive riparian conservation objectives developed by the Riparian Habitat Joint Venture (RHJV 1998) provide an excellent framework for prioritizing riparian bird conservation efforts within the Sierra, as well as throughout California. The reader is referred to that document for conservation objectives and recommendations.

LATE-SUCCESSIONAL/OLD-GROWTH FOREST

Objective 3. Safeguard existing high-quality LS/OG habitat throughout the Sierra.

Recommendation 3-1. Create a Sierra-wide LS/OG reserve network, to ensure the long-term maintenance of habitat for LS/OG-dependent birds.

The Sierra Nevada Forest Protection Campaign (Britting et al. 1999) recently called for the establishment of a an LS/OG reserve network, using the regions identified as Areas of Late Successional Emphasis in the SNEP report. This LS/OG conservation approach is one of two reserve design strategies endorsed by the SNEP Working Group on Late-Successional Conservation Strategies (Franklin et al. 1997). Such a reserve network would be managed for "the conservation and restoration of high quality LS/OG forests and associated ecosystem processes in those forests most strongly affected by the commercial logging and fire suppression practices of the past 150 years: westside mixed conifer, westside pine, red fir, eastside mixed conifer, and eastside pine" (Britting et al. 1999). We believe this strategy provides a workable means of safeguarding essential habitat for LS/OG-dependent birds. Again, as with the meadow reserve system, the results of management prescriptions implemented on LS/OG reserves must be monitored and modified in an adaptive management framework.

Recommendation 3-2. Study and revise fire and other management practices to help restore the Sierra's natural level of forest diversity, and to promote a gradual increase in the aerial extent of LS/OG forest. Fire regimes should be as similar to naturally occurring patterns as possible, in order to promote the long-term development of LS/OG forest, and to maintain historic levels of forest diversity and patchiness. In many parts of the Sierra, large fires present a substantial risk to humans and their property, and therefore are neither practical nor politically feasible. Moreover, in many areas the size and extent of fuel loads that have resulted from decades of fire suppression may prohibit the use of controlled fire regimes. Mechanically manipulating vegetation to mimic the forest structures created by fire is a potential solution; studies of its effects on forest ecology and avian community composition and nesting success are urgently needed.

Objective 4. Continue and improve efforts to monitor the population status of LS/OG dependent species.

Recommendation 4-1. Focus research efforts on the status of LS/OG-dependent species not adequately monitored by the BBS approach.

Much of the Sierra's remaining LS/OG habitat remains in areas with limited road access, and is consequently poorly sampled by BBS roadside transects. Indeed, nearly 60% of LS/OG-associated species are detected too infrequently during BBS surveys to allow calculation of reliable BBS trends (Tables 7 and 8). A handful of these species are known to be declining and/or very localized in their distribution, and are already under intensive study (e.g. Spotted Owl, Northern Goshawk), but the Sierra-wide status of others is relatively unknown. Monitoring and research efforts focusing specifically on LS/OG-dependent avifauna are urgently needed.

OAK WOODLANDS

Objective 5. Halt the rapid destruction of oak woodlands in the Sierra foothills.

Recommendation 5-1. Mount a vigorous public outreach campaign to insert a concern for oak woodlands preservation and the habitat needs of oak-dependent wildlife into the growth plans of Sierra foothill communities.

Unlike most conservation problems in the conifer forest belt, solutions to problems in oak woodlands depend primarily on actions on private rather than public lands; a relatively meager proportion of the Sierra's oak woodlands are contained in national forests and national parks. Outreach efforts must therefore be aimed at modifying activities, particularly land conversion for urbanization and residential development on private lands. Investigation of the design and extent of a Sierra-wide oak reserve network, similar to the LS/OG reserve network discussed above, should be implemented. Even more importantly, however, oak woodland preservation and safeguarding the habitat needs of oak-dependent species must be built into the growth plans of all Sierra foothill communities and counties.

Objective 6. Improve oak recruitment throughout the Sierra.

Recommendation 6-1. Study and revise fire and other land management practices to encourage oak regeneration.

Numerous factors, including fire management, livestock grazing, and invasion by exotic grasses have likely played roles in dampening oak recruitment throughout the Sierra. Research should focus on land management practices that might improve recruitment. Appropriate fire management is a very promising tool, and should be implemented where feasible.

SIERRA NEVADA REGION-WIDE RECOMMENDATIONS

Objective 7. Continue and expand current Sierra-wide bird monitoring efforts.

Recommendation 7-1. Recruit committed observers to continue surveying the Sierra BBS routes, including the 20 new routes generated since 1997.

BBS data provide an enormously valuable record of changes in bird abundance and distribution over time. The recent addition of more routes promises a dramatic improvement in our ability to detect changes in Sierra avian community dynamics over the coming years. The realization of this improvement, however, requires that committed observers be recruited to continue to conduct the surveys indefinitely into the future.

Recommendation 7-2. Design and implement a long-term, off-road, habitat-specific avian monitoring program.

Despite its tremendous value, the BBS protocol has substantial limitations, including its restriction to roadside survey points, and its inability to distinguish differences in avian community composition by habitat, let alone management regime. An off-road, habitat-specific monitoring program throughout the Sierra Nevada would be enormously valuable in providing baseline data on the status of many Sierra bird populations not adequately sampled by the BBS.

Recommendation 7-3. Deploy additional MAPS stations throughout the Sierra to better

understand the primary demographic parameters responsible for Sierra-wide population trends of numerous species.

An additional limitation of the BBS protocol is that it provides information only on secondary population parameters, such as population size and density, rather than primary demographic parameters like productivity, fecundity, survivorship and dispersal. Primary parameters may be more useful than secondary parameters in determining the causes of population changes, and suggesting possible actions to reverse them (DeSante and George 1994). Additionally, studying primary parameters over the short-term can elucidate long-term population trajectories (Hutto 1988, Temple and Wiens 1989).

The MAPS protocol allows the estimation or indexing of primary demographic parameters, including productivity and survivorship. The 15 MAPS stations currently in operation in the Sierra will shed much light on population changes of Sierra birds, and more importantly, proximate causes of those changes (i.e., changes in productivity, indicating problems on the Sierra breeding grounds, or changes in survivorship, which could reflect problems on far-away wintering grounds). However additional stations throughout the Sierra would be invaluable in increasing the precision of parameter estimates, and in providing truly Sierra-wide data. Existing stations are concentrated in Yosemite National Park and Tahoe National Forest, leaving the southern Sierra (as well as large regions of the central and northern Sierra) completely unrepresented.

Recommendation 7-4. Implement effective monitoring efforts for habitats, species, and seasons for which current efforts are insufficient.

Population size estimates, population trends, and detailed distributional information for chaparral-inhabiting species in the foothills of the Sierra are currently unavailable, despite the fact that a substantial portion of the entire breeding range of several of these species occurs in the Sierra foothills. Examples include California Rufous-crowned Sparrow (*A. r. ruficeps*), California Black-chinned Sparrow (*S. a. cana*), California Sage Sparrow (*A. b. belli*), and Lawrence's Goldfinch. Likewise, population size estimates, population trends, and detailed distributional information are also generally lacking in the Sierra for nocturnal species, particularly Long-eared Owl and most small owls. In addition, winter distributional information and the relationship between winter distribution and acorn, conifer nut and seed, and berry food crops is scanty and fragmentary. Effective long-term monitoring efforts to provide baseline data on these habitats, species, and processes should be implemented.

Objective 8. Focus hypothesis-driven research on the effects of specific land management practices on breeding, dispersing, migrating, and over-wintering birds, and on the relationships between spatial patterns of productivity, survivorship, and population trends, for selected target species.

Recommendation 8-1. Deploy additional MAPS stations in locations that will test the effects of specific land management practices on avian productivity and survival and the relationships between productivity, survivorship, and population trends.

If new MAPS stations are thoughtfully sited using spatially explicit,-landscape level habitat data, they will be enormously useful in determining the effects of specific habitat and management characteristics on avian community composition and demographic parameters. Forest composition and structure, timber harvest regimes and grazing practices are all examples of variables whose

effects on avian productivity and survivorship could be elucidated with appropriately placed MAPS stations.

A second fruitful approach is to site MAPS stations in habitat types, management regimes, and geographic areas in the Sierra where population trends for a given target species are decreasing, and in analogous habitats, management regimes, or geographic areas where population trends for the same species are stable or increasing. This will allow identification of the primary demographic cause of population declines (low productivity, low recruitment, or low survivorship). When coupled in a GIS with spatially explicit habitat and weather information, data from such MAPS stations will allow strong, testable hypotheses to be formulated regarding the ultimate environmental cause of population declines, and will aid in the identification of specific management actions and conservation strategies to reverse the declines.

Recommendation 8-2. Deploy nest-monitoring studies throughout the Sierra to provide a mechanistic understanding of how various habitat variables and land management practices affect nesting productivity.

Very little is known about the effects of different land management practices, including management regimes that govern fire control, timber extraction, and livestock grazing, on the nesting success of birds in general (Martin 1992), let alone Sierra birds. The BBIRD field protocol (Martin et al. 1997) provides a clear, standardized methodology for using nest monitoring to provide a mechanistic understanding of how habitats or management practices impact productivity. At least two large-scale, multi-species nest monitoring studies are currently in progress in the Sierra, but additional studies addressing a variety of habitat variables and land management practices should be implemented throughout the region.

Objective 9. Focus research efforts on the effects on bird populations of ongoing ecological changes in the Sierra including those caused by factors both internal and external to the Sierra.

Recommendation 9-1. Encourage the collection of data that will enable prediction of how ongoing changes in forest composition and structure brought about by management actions in the Sierra will affect avian community composition and population dynamics.

Although the overall state of forest health in the Sierra may be relatively good (Franklin and Fites-Kaufmann 1996) even subtle changes in age-class distribution, structure and composition of forest stands, and patterns of forest distribution across the landscape may have far-reaching implications for avian community composition (Hejl 1994). The ongoing conversion to white fir-dominated stands throughout much of the Sierra, as well as associated changes in forest structure, is likely to have a profound effect on the abundance and distribution of many Sierra bird species. . A far better understanding of habitat preferences and the ecological factors affecting nesting success of numerous bird species is required to predict the consequences of these changes for the Sierra avifauna. Such predictions are critical for proactively focusing monitoring and conservation efforts on the species that are most likely to require them in the coming decades, before populations become critically at-risk. If implemented thoughtfully, all the research and monitoring efforts called for in Recommendations 7-1 through 8-2 will contribute to reaching this goal.

Recommendation 9-2. Encourage the collection of data that will elucidate the likely effects on

Sierra bird populations of environmental factors originating from or acting outside of the Sierra. Three environmental factors originating from outside the Sierra are noteworthy here. First is large-scale human-caused climate change, particularly that associated with increased levels of CO_2 and other greenhouse gases. Relationships between climate change and ecological and demographic parameters of Sierra birds are likely to be very complex and to involve substantial time lags. Indeed, even the various manifestations of climate change itself, involving both temperature and precipitation, are likely to be complex and to show substantial seasonal variation. Precipitation, for example, could increase during winter leading to heavier snow packs and wetter conditions, but decrease (on the east side of the Sierra at least) during summer leading to drier conditions. Temperatures could be increased in some seasons and decreased in others. Initial analyses of Sierra MAPS data suggest an inverse relationship between winter precipitation and breeding productivity for several species, including certain meadow-dependent species such as Lincoln's Sparrow and MacGillivray's Warbler (P. Nott, pers comm.). These data suggest that increasingly dry winter conditions could lead in the short term to higher population sizes through increased productivity, but such conditions may also lead in the long term to increased drying out of meadows and subsequent populations declines through lowered recruitment due to loss of meadow habitat. The collection of long-term data relating both local and large-scale weather conditions to demographic parameters of Sierra birds is crucial for predicting likely consequences of climate change on Sierra birds. Even more importantly, demonstration of the probable ecological effects of climate change before they happen may provide one of the best means of triggering effective actions to reduce the anthropomorphic causes of climate change.

A second major environmental stressor from outside the Sierra that can effect the ecology of Sierran birds is large-scale, pervasive, airborne pollution. Detrimental effects on amphibians and piscivorous birds from acid deposition in lakes and rivers through rain and snow provide one of the best-known examples of the effects of this type of pollution. The ecological effects of smog, which has become pervasive over the southern (at least) Sierra in recent years, are virtually unknown. A third potential stressor is provided by the increased use of agricultural pesticides in the Central Valley which could negatively affect those flying insects in the Central Valley that are subsequently wind-drifted to higher elevations in the Sierra and that may provide important food sources for swifts, nighthawks, Olive-sided Flycatchers, and even Gray-crowned Rosy Finches which feed extensively on wind-drifted insects that are precipitated onto alpine snowpack. Additional research on the effects of airborne pollution and the effects of agricultural pesticides on wind-drifted insects is needed before either of these potential risks to Sierra birds can be dismissed.

A fourth factor operating outside the Sierra that could be very important in effecting Sierra bird populations is destruction and degradation of wintering habitat. Analyses presented earlier in this report suggest that Neotropical-wintering species are generally faring as well as or better than permanent resident and short-distance migrants, although declining trends in several species, including Olive-sided Flycatcher and Swainson's Thrush, may well be caused by conditions on their tropical wintering grounds. The same data, however, suggest that a major cause of the declines in short-distance migrants may well involve adverse wintering-ground conditions in southern California, Arizona, and northern Mexico. The conclusive demonstration of such links is critical for efforts to provide habitat protection of the wintering grounds. The encouragement of research and monitoring efforts to establish such links, including efforts to use genetic evidence and trace element analysis to establish concordance between breeding and wintering areas for discreet Sierra populations should be an integral part of any effective Sierra Nevada avian conservation

plan.

Objective 10. Maintain and restore habitat diversity throughout the Sierra Nevada.

Recommendation 10-1. Revise fire management regimes to mimic natural fire systems wherever possible.

Fire is critical for maintaining and restoring forest diversity. Using prescribed burns to clear out unnaturally high downed fuel loads, and then permitting low-intensity surface fires to run their course (where human structures are not threatened) can be a valuable tool for stimulating oak regeneration (see Recommendation 6-1), promoting the development of LS/OG forest characteristics (see Recommendation 3-2), and generally preserving forest heterogeneity, which is critical for maintaining the Sierra's full complement of avian diversity.

Recommendation 10-2. Integrate components of this avian conservation plan into management plans developed by federal agencies for their Sierra landholdings and into plans being created by counties and communities in the Sierra to guide growth and residential and commercial development.

The rapid growth of the human population in the Sierra, which involved a doubling in the twenty years between 1970 and 1990, is expected to accelerate over the next few decades (Duane 1996). This will not only involve greatly increased residential and commercial development of the lower elevations of the Sierra, but vastly increased pressure on all elevations for recreational use and water resources. This growth will place further demands on the public as well as private lands of the Sierra. It is imperative that this growth be planned and regulated in ways that preserve the ecological integrity and aesthetic values of the entire range. Comprehensive range-wide planning is already underway on lands managed by the USDA Forest Service and these plans are being integrated with planning processes for the individual national parks. It is crucial that the plans being developed by federal agencies take into account the human population growth that is inevitable, but is equally critical that important management concepts developed in public plans be included in the planning process for private lands. Moreover, it is essential that the underlying concepts developed in this avian conservation plan filter into subsequent plans for both private and public lands.

The challenge before us in the Sierra, to do it right this time, has never been more critical because we may never get another chance. Yet, the information and tools we have in our hands have never been more powerful and the willingness to cooperate has never been higher. We have an unprecedented opportunity to fashion the direction that management and development in the Sierra will take over the next few decades such that the Sierra can continue to remain, for all the world to see, "The Range of Light."

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Table 1. Breeding Bird Survey (BBS) population trend classification system.

Classification	No. of Routes	Trend	Sig. of Trend
Definitely increasing	n > 14	Tr > 1%	P < 0.05
	9 < n < 13	Tr > 1%	P < 0.01
Likely increasing	n > 14	Tr > 1%	0.05 < P < 0.1
	9 < n < 13	Tr > 1%	0.01 < P < 0.05
	5 < n < 8	Tr > 1%	P < 0.01
Possibly increasing	n > 14	Tr > 1%	P > 0.1
	9 < n < 13	Tr > 1%	0.05 < P < 0.1
	5 < n < 8	Tr > 1%	0.01 < P < 0.05
	1 < n < 4	Tr > 1%	P < 0.01
Increasing tendency	9 < n < 13	Tr > 1%	P > 0.1
	5 < n < 8	Tr > 1%	0.05 < P < 0.1
	5 < n < 8	Tr > 5%	P > 0.1
	1 < n < 4	Tr > 1%	0.01 < P < 0.05
Definitely decreasing	n > 14	Tr < -1%	P < 0.05
	9 < n < 13	Tr < -1%	P < 0.01
Likely decreasing	n > 14	Tr < -1%	0.05 < P < 0.1
	9 < n < 13	Tr < -1%	0.01 < P < 0.05
	5 < n < 8	Tr < -1%	P < 0.01
Possibly decreasing	n > 14	Tr < -1%	P > 0.1
	9 < n < 13	Tr < -1%	0.05 < P < 0.1
	5 < n < 8	Tr < -1%	0.01 < P < 0.05
	1 < n < 4	Tr < -1%	P < 0.01
Decreasing tendency	9 < n < 13	Tr < -1%	P > 0.1
	5 < n < 8	Tr < -1%	0.05 < P < 0.1
	5 < n < 8	Tr < -5%	P > 0.1
	1 < n < 4	Tr < -1%	0.01 < P < 0.05
Definitely stable	n > 14	-0.5% < Tr < 0.5%	--
Likely stable	n > 14	-1.0% < Tr < 0.5%	--
	n > 14	0.5% < Tr < 1.0%	--
Possibly stable	9 < n < 13	-1.0%< Tr < 1.0%	--
Stable tendency	5 < n < 8	-1.0%< Tr < 1.0%	--

Table 2. Trend classifications of all species with adequate data for calculating Sierra-wide BBS trends.

Negative Trends	Positive Trends	Stable Trends
Band-tailed Pigeon	Cassin's Vireo	Mountain Quail
Olive-sided Flycatcher		Red-shafted Flicker
Western Wood-Pewee		Hammond's Flycatcher
Steller's Jay		Audubon's Warbler
Mountain Chickadee		Western Tanager
American Robin		
Chipping Sparrow		
Dark-eyed Junco		
Brown-headed Cowbird		
Lesser Goldfinch		
Likely Decreasing:	***Likely Increasing:***	***Likely Stable:***
Golden-crowned Kinglet	Tree Swallow	Hairy Woodpecker
Green-tailed Towhee		Warbling Vireo
Cassin's Finch		Red-breasted Nuthatch
		Hermit Warbler
		MacGillivray's Warbler
		Fox Sparrow
Possibly Decreasing:	***Possibly Increasing:***	***Possibly Stable:***
Mourning Dove	Anna's Hummingbird	Barn Swallow
Belted Kingfisher	White-headed	House Wren
Acorn Woodpecker	Dusky Flycatcher	Black-throated Gray
Red-breasted Sapsucker	Hermit Thrush	Lazuli Bunting
White-breasted Nuthatch	Spotted Towhee	Red-winged Blackbird
Brown Creeper	Red Crossbill	
Winter Wren		
Townsend's Solitaire		
Orange-crowned		
Nashville Warbler		
Yellow Warbler		
Black-headed Grosbeak		
Brewer's Blackbird		
Decreasing Tendency:	***Increasing Tendency:***	***Stable Tendency:***
California Quail	Mallard	Turkey Vulture
Common Nighthawk	Red-tailed Hawk	American Dipper
White-throated Swift	Blue Grouse	Mountain Bluebird
Pileated Woodpecker	Pacific-slope Flycatcher	
Violet-green Swallow	Common Raven	
Bushtit	Cliff Swallow	
Bewick's Wren	Western Bluebird	
Ruby-crowned Kinglet	Wrentit	
Swainson's Thrush	European Starling	
Wilson's Warbler	Song Sparrow	
White-crowned Sparrow		
Purple Finch		
Pine Siskin		
Evening Grosbeak		

Table 3. Species with statistically significant Sierra-wide BBS population trends.

Species	Trend (% change/ yr)	Signif. Level[1]	No. of Routes
Decreasing Trends			
Band-tailed Pigeon	-5.69	***	14
Mourning Dove	-4.28	*	13
Belted Kingfisher	-19.16	***	4
Acorn Woodpecker	-5.34	**	7
Olive-sided Flycatcher	-3.75	***	17
Western Wood-Pewee	-2.87	***	17
Steller's Jay	-1.73	**	17
Mountain Chickadee	-1.89	**	16
Winter Wren	-5.00	**	7
Golden-crowned Kinglet	-4.02	*	17
American Robin	-3.07	***	17
Green-tailed Towhee	-3.88	**	12
Chipping Sparrow	-6.29	***	16
White-crowned Sparrow	-8.82	**	4
Dark-eyed Junco	-2.80	**	17
Brown-headed Cowbird	-4.85	***	15
Cassin's Finch	-3.06	*	14
Lesser Goldfinch	-6.80	***	9
Increasing Trends			
Anna's Hummingbird	+62.32	*	9
Cassin's Vireo	+3.98	**	16
Tree Swallow	+6.13	**	12
Red Crossbill	+5.91	*	7

[1]* = $p < 0.1$, ** = $p < 0.05$, *** = $p < 0.01$.

Table 4. Species that depend critically on montane meadow habitat in the Sierra.

Species	BBS trend
Great Gray Owl	insufficient data
Long-eared Owl	insufficient data
Vaux's Swift	insufficient data
Belted Kingfisher	possibly decreasing
Red-naped Sapsucker	insufficient data
Red-breasted Sapsucker	possibly decreasing
Willow Flycatcher	insufficient data
Tree Swallow	likely increasing
Northern Rough-winged Swallow	insufficient data
House Wren	possibly stable
Swainson's Thrush	decreasing tendency
American Robin	definitely decreasing
Orange-crowned Warbler	possibly decreasing
Nashville Warbler	possibly decreasing
Yellow Warbler	possibly decreasing
MacGillivray's Warbler	likely stable
Wilson's Warbler	decreasing tendency
Chipping Sparrow	definitely decreasing
Song Sparrow	increasing tendency
Lincoln's Sparrow	insufficient data
White-crowned Sparrow	decreasing tendency
Lazuli Bunting	possibly stable

Table 5. Species that are strongly associated with montane meadow habitat, but cannot be said to depend critically on it.

Species	BBS trend
Dusky Flycatcher	possibly increasing
Black Phoebe	insufficient data
Warbling Vireo	likely stable
Western Bluebird	increasing tendency
Mountain Bluebird	stable tendency
Vesper Sparrow	insufficient data
Sage Sparrow	insufficient data
Grasshopper Sparrow	insufficient data
Dark-eyed Junco	definitely decreasing
Red-winged Blackbird	possibly stable
Western Meadowlark	insufficient data
Pine Grosbeak	insufficient data
Purple Finch	decreasing tendency
Cassin's Finch	likely decreasing
Lesser Goldfinch	definitely decreasing

Table 6. Species that depend critically on late successional/old growth forest.

Species	BBS trend
Northern Goshawk	insufficient data
Spotted Owl	insufficient data
Vaux's Swift	insufficient data
White-headed Woodpecker	possibly increasing
Pileated Woodpecker	decreasing tendency
Red-breasted Nuthatch	likely stable
Pygmy Nuthatch	insufficient data
Brown Creeper	possibly decreasing
Winter Wren	possible decreasing
Hermit Warbler	likely stable
Purple Finch	decreasing tendency
Cassin's Finch	likely decreasing
Evening Grosbeak	decreasing tendency

Table 7. Species that substantially utilize late successional/old growth forest, but cannot be said to depend critically on it.

Species	BBS trend
Blue Grouse	increasing tendency
Band-tailed Pigeon	definitely decreasing
Flammulated Owl	insufficient data
Northern Pygmy Owl	insufficient data
Long-eared Owl	insufficient data
Northern Saw-whet Owl	insufficient data
Red-naped Sapsucker	insufficient data
Red-breasted Sapsucker	probably decreasing
Williamson's Sapsucker	insufficient data
Hairy Woodpecker	likely stable
Black-backed Woodpecker	insufficient data
Olive-sided Flycatcher	definitely decreasing
Willow Flycatcher	insufficient data
Hammond's Flycatcher	definitely stable
Steller's Jay	definitely decreasing
Tree Swallow	likely increasing
Chestnut-backed Chickadee	insufficient data
White-breasted Nuthatch	likely stable
Golden-crowned Kinglet	likely decreasing
Hermit Thrush	possibly increasing
Varied Thrush	insufficient data

Table 8. Species that depend critically on oaks or oak woodland.

Species	BBS trend
Band-tailed Pigeon	definitely decreasing
Flammulated Owl	insufficient data
Western Screech-Owl	insufficient data
Anna's Hummingbird	possibly increasing
Acorn Woodpecker	possibly decreasing
Nuttall's Woodpecker	insufficient data
Ash-throated Flycatcher	insufficient data
Cassin's Vireo	definitely increasing
Hutton's Vireo	insufficient data
Steller's Jay	definitely decreasing
Scrub Jay	insufficient data
Oak Titmouse	insufficient data
White-breasted Nuthatch	possibly decreasing
House Wren	possibly stable
Blue-gray Gnatcatcher	insufficient data
Western Bluebird	increasing tendency
Phainopepla	insufficient data
Orange-crowned Warbler	possibly decreasing
Nashville Warbler	possibly decreasing
B.-throated Gray Warbler	possibly stable
Black-headed Grosbeak	possibly decreasing
Bullock's Oriole	insufficient data
Lesser Goldfinch	definitely decreasing
Lawrence's Goldfinch	insufficient data

Table 9. Species that substantially utilize oaks or oak woodland but cannot be said to depend critically on them.

Species	BBS trend
California Quail	decreasing tendency
Bushtit	decreasing tendency
Bewick's Wren	decreasing tendency
Spotted Towhee	possibly increasing
Lazuli Bunting	possibly stable
Purple Finch	decreasing tendency

Table 10. Explanation of classification system for migratory status of Sierra bird species (after DeSante 1995).

Migratory Status	Code	Description
Resident	R	Year-round resident in the Sierra; most populations are sedentary.
Resident/short-distance migrant	R-SDM	Year-round resident in at least part of the Sierra, but migration to lower levels or movement out of the Sierra is apparent in at least some years.
Short-distance migrant	SDM	Most Sierra populations are migratory but winter at temperate latitudes in the U.S. or northern Mexico.
Short-distance/Neotropical migrant	SD-NTM	Most populations are migratory and winter regularly in both temperate and tropical latitudes. In many cases it is unclear exactly where Sierra populations winter.
Neotropical migrant	NTM	Most Sierra populations winter in tropical latitudes.

FIGURE 1.

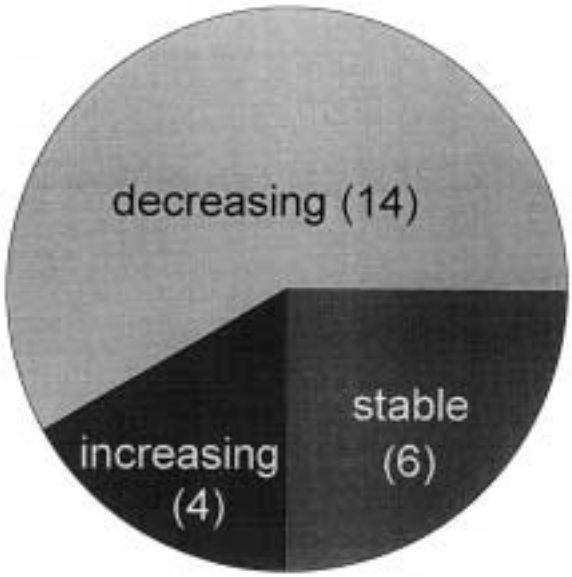

Figure 1. Proportion of increasing, decreasing, and stable population trends among the 24 species that require or substantially utilize montane meadow habitat and have calculable BBS population trends.

FIGURE 2.

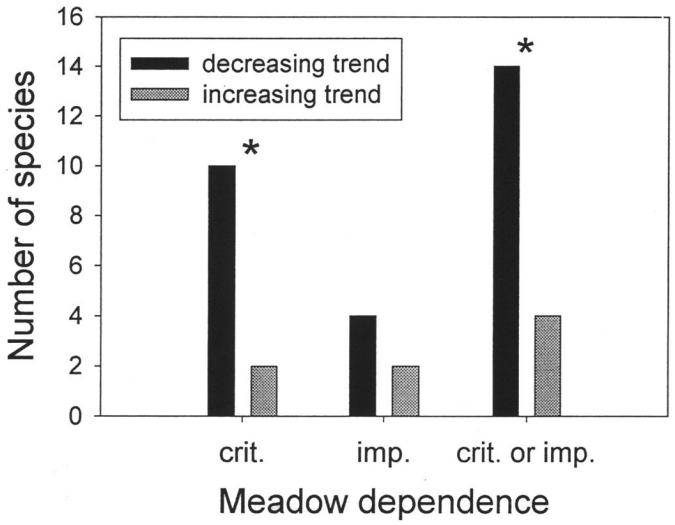

Figure 2. Number of increasing versus decreasing BBS population trends among species that are a) critically dependent on montane meadow ('crit.'), b) strongly associated with, though not critically dependent upon montane meadows ('imp.'), and c) critically dependent or strong associated with montane meadows. Asterisks indicate statistically significant departures from the expected distribution of decreasing and increasing trends, due to chance ($P < 0.05$).

FIGURE 3.

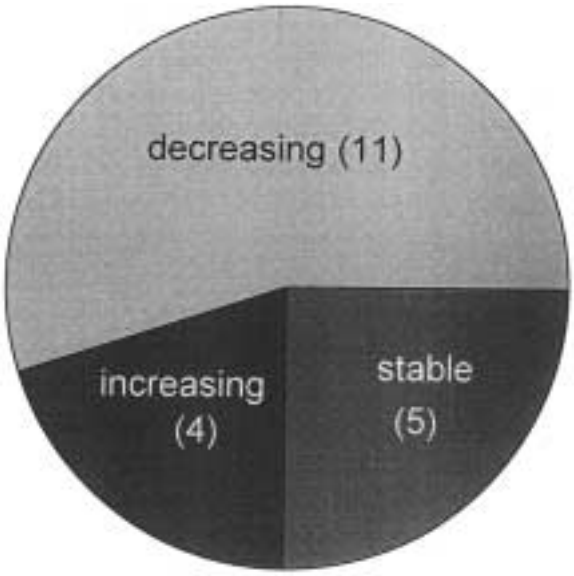

Figure 3. Proportion of the 20 species that require or substantially utilize LS/OG forest and have BBS population trends, that are decreasing, increasing, or stable.

FIGURE 4.

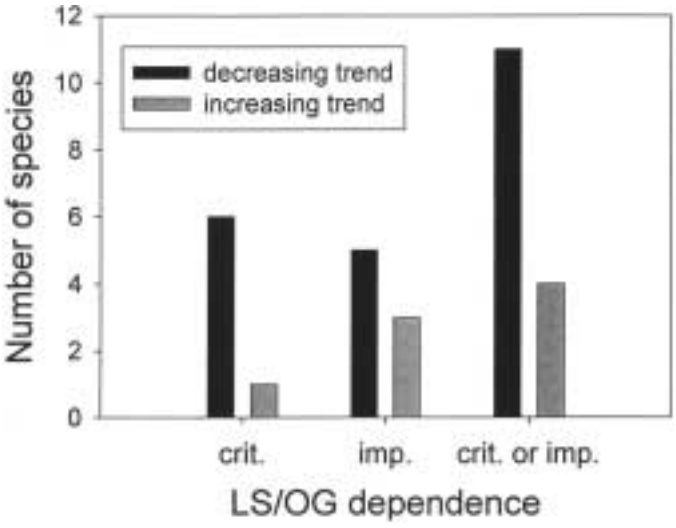

Figure 4. Number of increasing versus decreasing BBS population trends among species that are a) critically dependent on LS/OG forest ('crit.'), b) strongly associated with, though not critically dependent on LS/OG forest ('imp.'), and c) critically dependent on, or stronly associatd with LS/OG forest. No comparisons reached the threshold of statistical significance (Binomial Test, $P > 0.05$).

FIGURE 5.

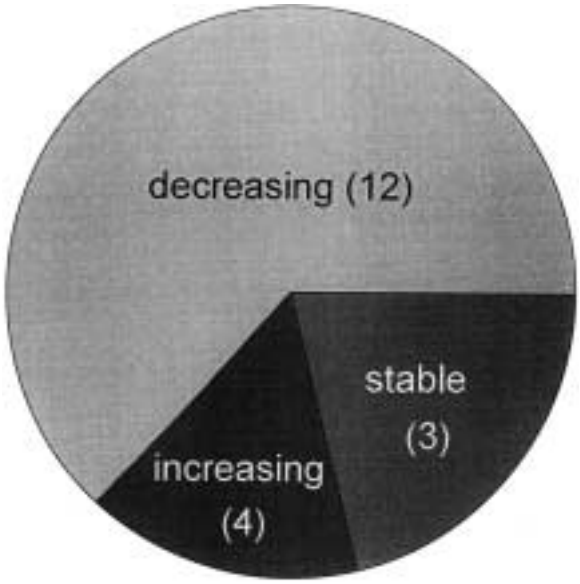

Figure 5. Proportion of the 19 species that require or substantially utilize oaks or oak woodlands and have BBS population trends, that are decreasing, increasing or stable.

FIGURE 6.

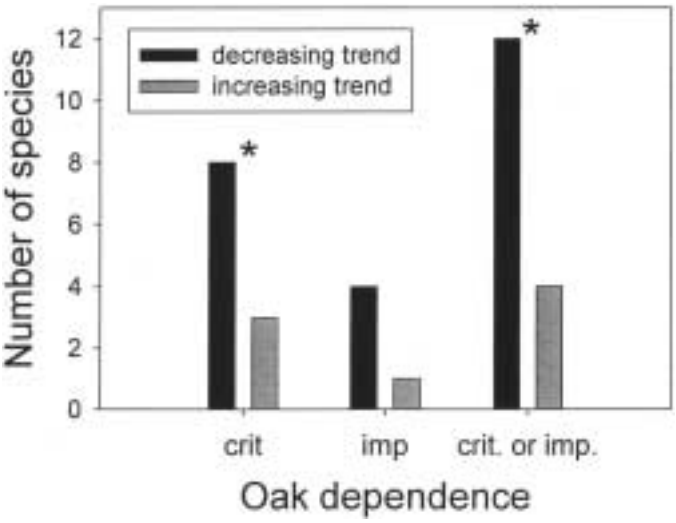

Figure 6. Number of increasing versus decreasing population trends among species that are a) critically dependent on oaks or oak woodland ('crit.'), b) strongly associated with, though not critically dependent on oaks or oak woodland ('imp.'), and c) critically dependent or strongly associated with oaks or oak woodland ('crit. or imp.'). Asterisks indicate statistically significant departures from distributions expected due to chance (Binomial Test, $P < 0.05$).

FIGURE 7.

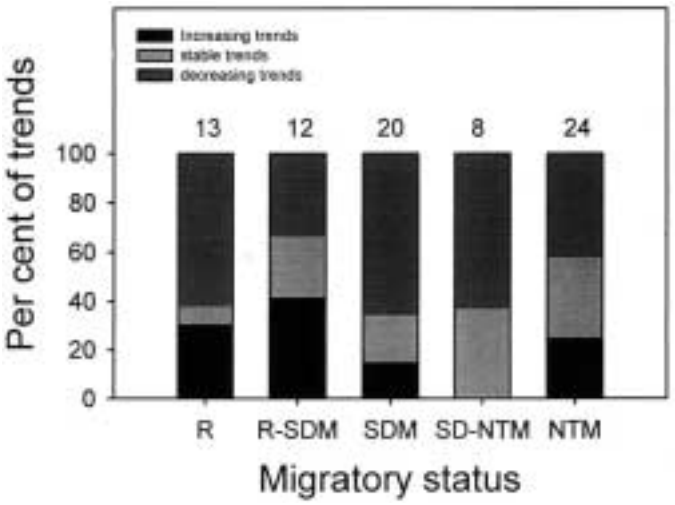

Figure 7. Percent of calculable BBS population trends within each migratory status classification that are increasing, stable or decreasing. Numbers above bars indicate total number of species with calculable trends in each migratory status classification.

FIGURE 8.

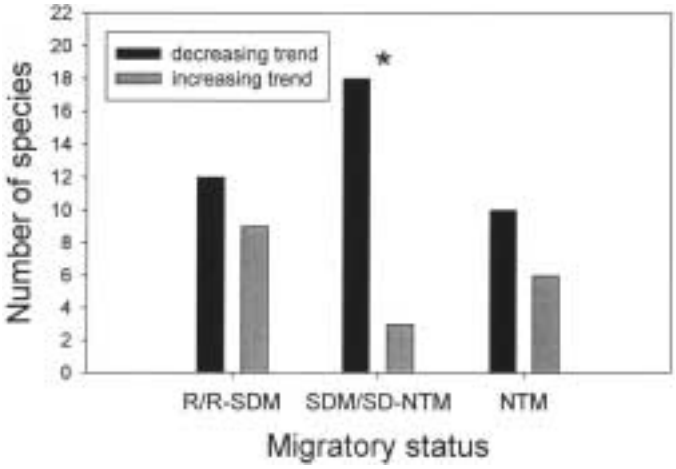

Figure 8. Number of species with decreasing and increasing Sierra-wide trends, grouped by migratory status. Migratory status classifications are discussed in the text and in Table 10. Asterisk indicates a statistically significant departure from the expected distribution (Binomial Test, $P < 0.005$).

FIGURE 9.

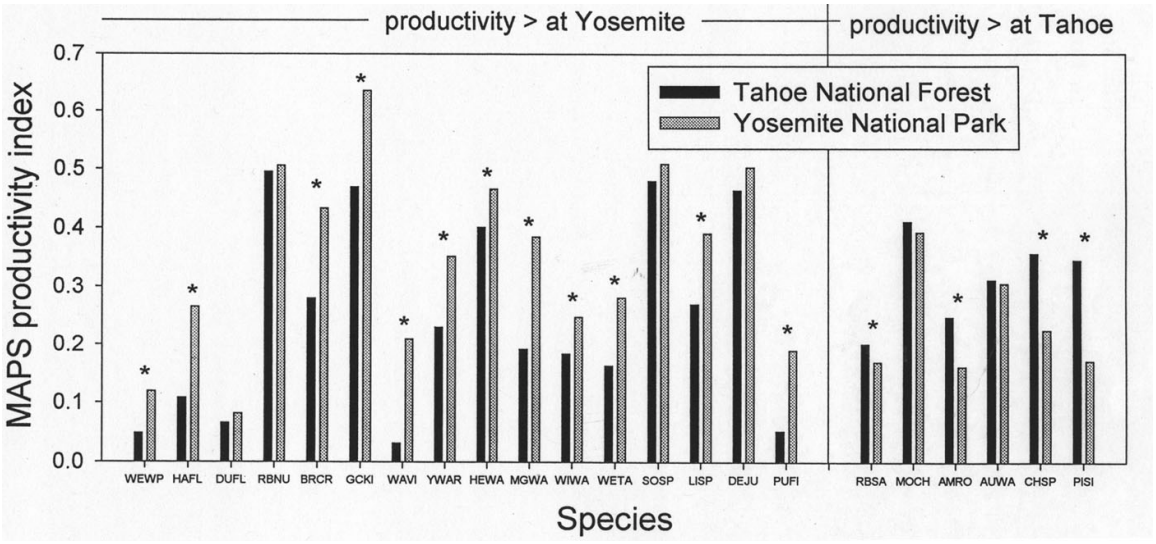

Figure 9. Productivity indices from MAPS stations at Yosemite National Park vs. productivity indices from MAPS stations on and adjacent to Tahoe National Forest. Asterisks indicate comparisons that differ at least by 10%.

Appendix 1: Species Accounts for the Landbird Avifauna of the Sierra Nevada

David F. DeSante

This appendix summarizes the status, distribution, abundance, population trends, and demographics of the landbirds of the Sierra Nevada ecosystem, as well as the significance of the Sierra to each species' and subspecies' overall range and range in California. This report also attempts to define the risks that each Sierran species currently faces and to speculate on the causes of current population trends. The species accounts presented here were originally developed in 1995 as part of a report to the Sierra Nevada Ecosystems Project. They remain unaltered, except that BBS data analyses and MAPS survival estimates have been updated to incorporate more recent data.

Included in this report are all species of landbirds known or strongly suspected to have bred at least once in the "Sierra proper" (as defined in the main body of this report) with the exception of diurnal raptors (order *Falconiformes*) and gallinaceous species (order *Galliformes*). Included, therefore, are the *orders Columbiformes, Cuculiformes, Strigiformes, Caprimulgiformes, Apodiformes, Coraciiformes, Piciformes,* and *Passeriformes*.

Species of landbirds (defined as above) that breed (or formerly bred) in the Central Valley and, perhaps, the lowermost foothills of the west slope of the Sierra that are excluded from this report include: Spotted Dove (*Streptopelia chinensis*), Yellow-billed Cuckoo (*Coccyzus americanus*), Burrowing Owl (*Speotyto cunicularia*), Short-eared Owl (*Asio flammeus*), Lesser Nighthawk (*Chordeiles acutipennis*), Bank Swallow (*Riparia riparia*), Yellow-billed Magpie (*Pica nuttallii*), Northern Mockingbird (*Mimus polyglottos*), Bell's Vireo (*Vireo bellii*), Tricolored Blackbird (*Agelaius tricolor*), and Hooded Oriole (*Icterus cucullatus*).

All but two of these species, Spotted Dove and Yellow-billed Magpie, also breed (or formerly bred) just east of the Sierra or in the Valley of the South Fork of the Kern River. I know of no breeding records for the Sierra proper for any of the above 11 species, although some of them, including Burrowing Owl, Short-eared Owl (possibly), Bank Swallow, Yellow-billed Magpie, Northern Mockingbird, and (possibly) Tricolored Blackbird, have occurred in the Sierra proper as transients. In addition, Rock Dove, Black-chinned Hummingbird, Say's Phoebe, American Crow, Common Yellowthroat, Blue Grosbeak, Lark Sparrow, and American Goldfinch should, perhaps, be included in this same category because, except for a single, old nesting record of Blue Grosbeak at 1,700' along the Merced River, I know of no verified breeding records for any of these species for the Sierra proper. Nevertheless, I have included them in this report because summer records in the Sierra indicative of possible or probable breeding exist for all of them.

Nine additional species of landbirds that breed (or formerly bred) just east of the the eastern base of the Sierran escarpment, in the Valley of the South Fork of the Kern River, or near Walker Pass, Kern County, are also excluded from this report: Costa's Hummingbird (*Calypte costae*), Ladder-backed Woodpecker (*Picoides scalaris*), Brown-crested Flycatcher (*Myiarchus tyrannulus*; which, I believe, has bred at least once in the Valley of the South Fork of the Kern River), Eastern

Kingbird (*Tyrannus tyrannus*; which has bred once in the Honey Lake Basin), Cactus Wren (*Campylorhynchus brunneicapillus*), LeConte' Thrasher (*Toxostoma lecontei*), Gray Vireo (*Vireo vicinior*), Summer Tanager (*Piranga rubra*), and Scott's Oriole (*Icterus parisorum*). As with the former 11 species, I know of no breeding records for the Sierra proper for any of these nine species. Moreover, of all these nine species, only Costa's Hummingbird has been recorded in the Sierra proper. In addition, Sage Thrasher should, perhaps, be included in this same category as I know of no verified breeding record for the Sierra proper. Nevertheless, I have included it in this report because summer records in the Sierra indicative of possible breeding may exist.

Finally, all species of landbirds that occur in the Sierra proper only as winter residents or visitants, rare summer visitors, passage migrants, or vagrants have been excluded from this report. Noteworthy in this regard are Rufous Hummingbird (*Selasphorus rufus*), Varied Thrush (*Ixoreus naevius*), Cedar Waxwing (*Bombycilla cedrorum*), Townsend's Warbler (*Dendroica townsendi*), and Golden-crowned Sparrow (*Zonotrichia atricapilla*), all of which migrate through or winter in the Sierra in substantial numbers. In addition, Bohemian Waxwing (*Bombycilla garrulus*) and Northern Shrike (*Lanius excubitor*) appear to be irregular winter visitants to the Sierra proper, while Allen's Hummingbird (*Selasphorus sasin*) and American Redstart (*Setophaga ruticilla*) may be regular passage migrants in small numbers.

In summary, this report deals with 146 species of landbirds that may be considered to comprise the breeding landbird fauna of the Sierra Nevada.

Major sources of information used in the preparation of this report were:

1. Literature

The Distribution of the Birds of California (Grinnell and Miller 1944) for status and habitat information for Sierran birds and for detailed distributional information for California for all species and subspecies found in the Sierra and in California.

The AOU Checklist of North American Birds (American Ornithologists' Union 1983 and Supplements appearing every two years in the Auk) for taxonomy and nomenclature and for continental aspects of bird distribution.

The AOU Checklist of North American Birds (American Ornithologists' Union 1957) for subspecific taxonomy and nomenclature and for the continental distrbutions of all subspecies that occur in the Sierra.

Distributional Checklist of North American Birds (DeSante and Pyle 1986) for supplemental state-by-state status and abundance information of North American birds.

Birds of Yosemite and the East Slope (Gaines 1988 and revised 1992) for detailed status, abundance, habitat, and life history information on central Sierran birds.

Discovering Sierra Birds (Beedy and Granholm 1985) for supplemental status, abundance, habitat, and life history information on birds of the west slope of the entire Sierra.

Of these, Grinnell and Miller (1944) and Gaines (1988) provided the bulk of the information used in the preparation of this report.

2. Databases Data from the North American Breeding Bird Survey (BBS) from the Sierra Nevada phyiographic province from 1966-1996 were used to determine abundance categories and population trends for Sierra birds. Discussion of the methods and important limitations of these data are presented in the main body of this report.

Monitoring Avian Productivity and Survivorship (MAPS) data from the 12 constant-effort mist-netting stations operated during various summers in the Sierra Nevada between 1990-1994 (for productivity indices) and 1993-1996 (for survival estimates). The MAPS program is coordinated and administered by The Institute for Bird Populations. Data used in this report include summary regional adult population size and productivity indices and estimates of annual survival rates and recapture probabilities.
Additionally, data on the population dynamics of subalpine Sierran birds in the Harvey Monroe Hall Natural Area of the Inyo National Forest were used to provide supplemental and incidental information for this report. These data were collected by the author (and assistants) during 22 years (1977-1998) of spot mapping, nest monitoring, and limited color-banding-resighting studies.

All inferences regarding potential risks faced by Sierran birds and possible causes of population trends and all suggestions regarding management actions to reduce risks or reverse negative trends are entirely the opinion and responsibility of the author unless supporting references are cited.

The results of this survey and synthesis are presented below. The accounts are organized as follows:

1. Species common and scientific names: Nomenclature and order of listing follow AOU (1983) as updated every two years in The Auk .

2. Stat: Status in the Sierra. The migratory status of the species in the Sierra is provided first. Codes follow the criteria in Table 10 of the main body of the report.

Next, status and abundance codes are presented separately for the west and east slopes of the Sierra. These codes were taken, with some modification, from Gaines (1988) and are most appropriate for the central Sierra, but are generally applicable to the entire range. Definitions of Gaines' codes, in turn, were borrowed from DeSante and Pyle (1986) and are as follows:

Status codes:
R = Resident and confirmed breeder.
S = Summer resident and confirmed breeder.
S* = Summer resident with no evidence of breeding.
T = Transient. Includes passage migrants and up- or down-slope visitors during spring, summer, or fall. Abundance classifications given for transient status reflects the species' abundance at higher and/or lower elevations than the breeding range.
W = Winter resident or winter visitor.
Abundance codes:
c = common or abundant

f = fairly common
u = uncommon
r = rare
x = exceptionally rare; less than 10 total records during the season over all years.

Prefixes to abundance codes:
l = local. Found at but a few discreet locations within its range.
i = irregular.
Numbers vary markedly from year-to-year. The abundance code given for species with an irregular status classification generally reflects abundance when the species does occur. Obviously, in some years, they are present in lower numbers than indicated and, rarely, in higher numbers.

3. Dist: Distribution of the species in the Sierra. First is given a code that describes the species' north-south distribution:

T = throughout the Sierra from north to south (but not necessarily from east to west).
N, C, S = northern, central, southern respectively.
NC = northern and central,
CS = central and southern, etc.
NE = northern part of east slope,
CSE = central and southern part of east slope, etc.

Following this, elevational limits (in 1,000' intervals abbreviated as 2 = 2,000', 10 = 10,000', etc.) are given separately for breeding (B), for transient or summer visitant status (T), and for wintering (W). These elevational limits were taken with relatively little modification from Gaines (1988) and, as such are strictly applicable only for the central Sierra. In general, one should add about 1,000' to both the lower and upper elevational limit for the extreme southern Sierra and subtract about 1,000' for the extreme northern Sierra.

F = the lowest foothills of the west slope at less than 1,000' to 1,500' elevation.
B = the eastern base of the Sierran escarpment on the east slope at about 3,000' to 4,000' in the south, 4,000' to 5,000' in the north, and as high as 6,000' to 7,000' on the central part of the east slope.

4. Sign: Significance of the Sierran range of the species to its continental and California range. In other words, the importance of the Sierra to the species overall populations. This importance is indicated by an importance classification system that increases in importance from 1 to 12. Importance classifications are as follows:

CONT-1 = Distributed over much of the entire North American continent north of Mexico, including at least the southern part of Canada.
US-2 = Distributed over much of the United States including both the eastern and western parts, but generally absent from Canada.
CAN/WMT-3 = Distributed over much of Canada and the mountains of western U.S. but absent from eastern U.S. except perhaps in the Appalachians.

CAN/EUS-3 = An unusual distribution for species absent from most of western U.S. except along the Pacific Coast or locally in the Southwest.
WEST-4 = Limited to western North America including at least the southern part of Canada, but widely distributed in the west.
WUS-5 = Rather widely distributed in western U.S., but generally does not occur in Canada.
WMT-6 = Occurs over much of western North America, but generally limited to the higher mountains, at least in the U.S.
PAC-7 = Generally limited to the Pacific Slope of western North America, and does not generally occur in the Great Basin or Rocky Mountains.
RM/GB-8 = Limited primarily to the Great Basin and/or Rocky Mountain region of western U.S., and generally absent from the Pacific Slope.
SW-9 = Limited to the southwestern U.S., often including much of California.
CAL-10 = Occurs, for the most part only in California, but widely distributed over much of the state.
PCAL-11 = Occurs in only a portion of California.
SIE-12 = Essentially or entirely endemic to the Sierra.

If a species is divided into recognized subspecies, the Sierran range and a separate importance classification is provided for every subspecies that breeds in the Sierra. These importance classifications are usually supplemented by some explanatory text unless they are completely straightforward.

5. Hab: Habitat preferences and descriptions. Habitat preferences for each species for reproduction (R) and feeding (F) are provided for all habitats given a high (3) or medium (2) value classification according to the Wildlife Habitat Relationships (WHR) for California as a whole. These WHR were taken from AVESBASE (Davidson and Manley (1993). I did not record habitats given a low (1) value classification nor did I utilize relationships for cover as I have never been able to appreciate the significance of these classifications. Nor did I utilize habitat size classes or canopy closure classes, because I feel that these aspects of the habitat can be more accurately and effectively conveyed in succinct, integrated, holistic descriptions that incorporate other important variables such as moisture regime, shrub components, and edge vs. interior preferences.

Habitats considered here are those thought to exist in substantial amounts in the Sierra and be of some importance to at least some members of the Sierran landbird community. The order of listing of habitats does not indicate any order of importance to the species, other than the fact that class 3 habitats are listed before class 2 habitats. Rather, forest and woodland habitats are listed first, followed by shrubland or grassland habitats, followed finally by human-created habitats. Forest and woodland habitats are listed generally as they occur from west to east (lower to higher elevations on the west slope followed by higher to lower elevations on the east slope). Shrubland or grassland habitats are listed from high to low moisture regime. Habitats included in this report and their order of listing are: MHW - montane hardwood; MHC - montane hardwood-conifer; PPN - ponderosa pine; DFR - Douglas fir; MCN - mixed conifer; JPN - jeffrey pine; RFR - red fir; LPN - lodgepole pine; SCN - subalpine conifer; ASP - aspen; EPN - eastside pine; PJN - pine-juniper; JUN - juniper; WTM - wet meadow; MRI - montane riparian; MCP - montane chaparral; ADS - alpine dwarf scrub; BAR - barren; PAS - pasture; and RSP - residential-park.

Probably because the Wildlife Habitat Relationships presented in AVESBASE are not specific to the Sierra but rather encompass all of California, I often found habitats that I believed to be classified too high for a given species. Such habitats are enclosed in single parentheses () and indicate that the value of the habitat should be at least one class lower. In a few cases I found classifications that I believed were completely erroneous for anywhere in California (or elsewhere for that matter). A prime example was Western Meadowlark, class 3 in Douglas fir forests! Such classifications are enclosed in double parentheses (()) and indicate that the classification is in error. In still other cases, I felt that habitats of high or medium value to a species in the Sierra were missing from the WHR. I added such habitats under the appropriate 3 or 2 heading but enclosed them in brackets [] to indicate that they were absent from the WHR.

Finally, I provided a brief narrative description of what I believe to be the key elements of preferred Sierran habitat for each species considered here. These narratives were based extensively on similar descriptions in Grinnell and Miller (1944), Gaines (1988), and, to a lesser extent, Beedy and Granholm (1985). In all cases, I modified these descriptions, when necessary, based on my personal experience.

6. Abundance: Data on relative numbers of Sierran landbirds were compiled from two sources: the North American Breeding Bird Survey (BBS) coordinated by the USDI National Biological Service and the Monitoring Avian Productivity and Survivorship (MAPS) Program coordinated by The Institute for Bird Populations. BBS results are presented as: (1) the number of BBS routes (out of 17 total) in the Sierra Nevada physiographic region (Stratum 66) from which data was used to calculate the regional trend for the species; and (2) the average relative abundance, that is, the mean number of birds seen or heard on the routes used in this analysis (given as birds per route). This latter includes routes on which the species was never recorded provided, of course, that the species was recorded somewhere in the Sierra Nevada on (presumably) at least two BBS routes. These data were taken from the on-line interactive route regression module provided by the BBS, and include data from the 31-year period 1966-1996.
MAPS results are presented as the mean number of adult birds captured per 600 net-hours at all 12 of the MAPS stations operated in the Sierra Nevada over the five years 1990-1995. I used 600 net-hours as the standard for comparison because it represents the amount of effort expended at a typical single MAPS station during a single season (ten 12-meter mist nets operated for six hours per day, for one day per 10-day period, and for ten consecutive 10-day periods from May 21 through August 28). These relative abundance data from MAPS must be interpreted with caution because 10 of the 12 Sierran MAPS stations were located at a forest-meadow interface between about 4,300' and 7,900' elevations. Moreover, mist nets tend to capture birds more efficiently that forage near the ground than those that forage in the canopy.

7. Trends: Population trends are based on 30 years (1966-1996) of BBS data for the Sierra Nevada physiographic region. Trend data, where available, are presented for each species first by one of the following trend classifications:

DI – Definitely increasing LI – Likely increasing PI – Possibly increasing IT – Increasing tendency

DS – Definitely stable LI – Likely stable PI – Possibly stable ST – Stable tendency

DD – Definitely decreasing LD – Likely decreasing PD – Possibly decreasing IT – Increasing tendency

UN – Trend unknown due to small sample size

Criteria for inclusion in each category are described in Table 1 of the main body of this report.

Because of the limited number of years that the MAPS Program has existed in the Sierra and the comparably few stations operated, reliable trend data is not yet available from MAPS.

8. Demographics: Preliminary demographic data are available for various landbird species from the MAPS Program (DeSante 1992, 1994). These data are presented as follows:
Productivity: Productivity indices are presented for various species as the percentage of young in the catch, which is defined as 100*(the total capture rate of young birds)/(the total capture rate of all birds identified to age). Productivity data for a given species are included only from stations where the species is known to breed. Thus, for example, no productivity data is reported for the Orange-crowned Warbler because this species breeds at lower elevations than those at which all of the 12 Sierran MAPS stations were located. Productivity indices from MAPS are reported for 55 landbird species for which at east 10 aged individuals were captured during the five years of the study. The numbers of aged individuals contributing to these data varied from a low of 12 for Williamson's Sapsucker and Downy Woodpecker to a high of 2,151 for Dark-eyed Junco, and averaged 266.3 for the 55 species.

Survivorship: Estimates of the annual survival rate of adult birds and the capture probability of adults were obtained from modified Cormack-Jolly-Seber mark-recapture analyses (Pollock et al. 1990, Lebreton et al. 1992) using the computer program SURVIV. Estimates were obtained using a model that differentiates between resident and transient adults, and incorporates constant survival and capture probability.

Estimates of annual survival rates and recapture probabilities for adult birds were based on four years (1993-1996) of pooled mark-recapture data from 12 MAPS stations (five in Yosemite National Park and seven on or adjacent to Tahoe National Forest). Estimates of annual survival rates of adult birds (and their standard errors), along with estimates of capture probabilities for adult birds (and their standard errors) are presented in the Species Accounts of each species for which adequate data existed.

9. Potential risks and suggested causes of population trends: The final section in each species account outlines the potential risks that the species faces and, at least for those species undergoing definite or likely population changes, provides suggestions as to possible causes of the changes. As should be evident from the results presented to date, only the barest of beginnings have been established regarding demographic monitoring of Sierran birds. Without detailed habitat specific data on primary demographic parameters it is very difficult to deduce causes of population changes.

Thus, most of the material presented in this section must be considered speculative at best. I hope, however, that it can provide some direction for future research efforts and management strategies.

Finally, I must specify non-landbird (as defined here) species of the Sierra that critically need study -- just so I can be assured that they are not somehow missed:

Wood Duck
Harlequin Duck
Osprey
White-tailed Kite - may not breed in the Sierra proper
Bald Eagle
Sharp-shinned Hawk
Cooper's Hawk
Northern Goshawk
Swainson's Hawk - may not breed in the Sierra proper)
Golden Eagle
Peregrine Falcon
Prairie Falcon
Blue Grouse
Sage Grouse - may not breed in the Sierra proper

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SPECIES ACCOUNTS

ROCK DOVE - *Columba livia*
Stat: R **West:** rR?,xT. **East:** rR?,xT.
Dist: T **West: N:**F-2?; **T:**F-10; **W:**F-2. **East: N:**B-4? **T:**B-10; **W:**B-4.
Sign: CONT-1. This is a species of cities, towns, and extensive agricultural areas in the lowlands. Sierran population is extremely small and insignificant to the species. Probably no valid breeding records above the lowermost foothills.
Hab: **R:** 3-RSP.
F: 3-PAS,RSP.
Sp: This feral species is almost completely dependent upon cities and extensive agricultural areas throughout its range.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: No obvious risks except diseases from infected populations. Not necessarily a desirable element in the Sierran ecosystem because it could cause disease among native pigeons.

BAND-TAILED PIGEON - *Columba fasciata*
Stat: SDM **West:** uS,rT,ifW. **East:** irS,irT.
Dist: T **West: N:**F-6; **T:**F-10; **W:**F-5. **East: N:**8; **T:**B-10.
Sign: WEST-4 (but absent from most of the northern interior of western North America so distribution really a composite of PAC-7 and SW-9). **Ssp.** *monilis* PAC-7.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,MRI,RSP.
F: 3-MHW,MHC,MCN,MRI,RSP; 2-PPN,DFR,MCP.
F: Because acorns are their staple food the species is highly dependent upon oaks for foraging both in and out of the nesting season. When the acorn crop fails, they resort to the fleshy fruits of madrone, toyon, manzanita, elderberry, dogwood, and chokecherry, or turn their attention to grain fields. They also require a steady source of water.
Abundance: BBS: 14 routes; 2.40 birds/route. **MAPS:**
Trends: BBS: DD; -5.7% per year ***
Demographics: MAPS:
Potential risks and suggested causes of population trends: One of ten Sierran species in definite and serious decline. Risks and causes of decline difficult to assess. My best guess is that its winter (and perhaps breeding) food supply (primarily acorns and secondarily other fruits) may be declining. Perhaps acorn production in the Sierra is down because of the recent history of extreme weather conditions, especially drought. Or perhaps there is a decrease in the population of oaks due to natural attrition and poor productivity. It is of interest in this regard that Acorn Woodpeckers and Scrub Jays also show similar negative population trends in the Sierra (-5.3 for the woodpecker and –3.2 for the jay). The species may breed semi-colonially so decreasing populations may act to stimulate further decreases by decreasing the impetus for breeding. It is also possible (but unlikely?) that transmission of disease from Rock Doves has contributed. Hunting pressure may also be a relatively minor risk. Regardless, it is very definitely a species that needs study.

MOURNING DOVE - *Zenaida macroura*
Stat: SDM **West:** uS,rT,rW. **East:** fS,rT.
Dist: T **West: N:**F-5; **T:**F-10; **W:**F-4. **East: N:**B-7; **T:**B-10.
Sign: CONT-1. **Ssp.** *marginella* WEST-4. Primarily a species of open country in foothills and lower elevations; thus, the Sierra is relatively unimportant to their overall or California populations.
Hab: **R:** 3-MHW,MHC,PPN,MRI,RSP; 2-DFR,MCN.
F: 3-MHW,MHC,PPN,MRI,PAS,RSP; 2-DFR,MCN,EPN,MCP.
F: Open grassy areas bordered by woodland or scrub. A water source within their daily cruising radius is also necessary.
Abundance: BBS: 13 routes; 1.66 birds/route. **MAPS:**
Trends: BBS: PD; -4.3% per year *
Demographics: MAPS:
Potential risks and suggested causes of population trends: Another declining species that is difficult to assess. It is a short-distance migrant that winters primarily in the grassland habitats of the southern United States and northern Mexico. These grasslands are being seriously overgrazed and otherwise degraded and are being destroyed for residential and agricultural purposes. Many grassland-inhabiting short-distance migrants are in decline. I suspect this is the major problem. Loss of riparian habitat for drinking and roosting, especially in winter but, to a lesser extent, also during the breeding season may also be a factor. Hunting pressure presents another risk -- perhaps especially severe in Mexico.

GREATER ROADRUNNER - *Geoccoyx californianus*
Stat: R **West:** rR,xT. **East:** rR,xT.
Dist: TW,SE **West:** N:F-3; **T:**F-4; **W:**F-3. **East: N:**B-4; **T:**B-7; **W:**B-4.
Sign: SW-9. Sierran population very small and of insignificant importance to the species.
Hab: **R:**
F:
F: A species of arid open land with scattered bushes or thickets, generally at lower elevations than the Sierra proper.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: This species has been in decline in California for a long time (Grinnell and Miller 1944) and I suspect it has declined dramatically in the Sierran foothills as well. Human development of its habitat (both residential and agricultural) is unfavorable for this species. A general decline in its prey base (primarily lizards and snakes) may be a very important risk.

BARN OWL - Tyto alba
Stat: **R** **West:** fR,rT. **East:** fR,rT.
Dist: TW,SE **West: N:**F-2; **T:**F-6; **W:**F-2. **East: N:**B-4; **T:**B-7; **W:**B-4.
Sign: US-2. **Ssp.** *pratincola* - US-2. Sierran population very small and of very little importance to the species.
Hab: **R:** 3-MHW,MHC,(PPN),(DFR),(MCN),MRI,MCP,BAR,RSP; 2-PJN.
F: 3-MHW,MHC,(PPN),(MCN),WTM,MRI,MCP,PAS,RSP; 2-PJN.
F: Generally confined to lower elevation valley bottoms and lower foothills where they dwell in rolling oak savannah and riparian habitats and nest in buildings, cavities in cliffs, or occasionally hollow trees.
Abundance: BBS: **MAPS:**

Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of large old oaks and cottonwoods for nests may be compensated for by increased human structures. Modern structures, however, seem less likely to harbor Barn Owls, so nest supply may be limited. Like many valley raptors, loss of prey base due to residential and agricultural development and increased pesticide levels are risks.

FLAMMULATED OWL - *Otus flammeolus*

Stat: NTM **West:** uS. **East:** rS.
Dist: T **West:** **N:**3-7. **East:** **N:**6-8.
Sign: WMT-6. **Ssp.** *flammeolus* - WTM-6. This species is generally quite uncommon and of irregular distribution over most of its range. Local Sierran populations can be relatively large for this species; thus, the Sierra is of greater importance for this species than for most other WMT-6 species.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,JPN,(RFR),(LPN),(ASP),(EPN),(MRI); 2-(SCN), (PJN).
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,(RFR),(LPN),(ASP),(EPN),(MRI); 2-(SCN), (PJN).
F: Favors open forests of black oak mixed with conifers, especially ponderosa pine and white fir, interspersed with small shrubby openings. Unlike most Sierran owls, they are almost completely insectivorous. Cavity nester.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of old snags with large woodpecker holes may be critical. General decline in populations of black oaks is another risk. Poor production of large insects due to drought and other weather-related factors is another likely risk. Pesticide use in tropical upland forests and loss of snags there may also be a problem. This species need extensive study. I believe it may be in trouble.

WESTERN SCREECH-OWL - *Otus kennicottii*

Stat: **R** **West:** lfR,rT. **East:** lfR,rT.
Dist: TW,SE **West:** **N:**F-4; **T:**F-8; **W:**F-4. **East:** **N:**B-5; **T:**B-10; **W:**B-5.
Sign: WEST-4. **Ssp.** *quercinus* on West slope - CAL-10; inyoensis along base of southern East slope; of limited distribution from the Inyo region of eastern California East to northwestern Utah - SW-9. Mostly confined to lower elevation foothill woodland so Sierran populations are of relatively low importance to the species.
Hab: **R:** 3-MHW,MHC,MRI,RSP; 2-PPN,(JPN),(RFR),(LPN),(SCN),(EPN),(PJN),(JUN).

F: 3-MHW,MHC,MRI,WTM,PAS,RSP; 2-PPN,(MCN),(JPN),(RFR),(LPN),(SCN),(EPN), (PJN),(JUN).
F: Prefers broken woodlands of live and blue oaks that may or may not be mixed with conifers. Also occurs often in riparian situations.

Cavity nester.
Abundance: **BBS:** **MAPS:**

Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Loss of oak and riparian cottonwood habitat is perhaps the major risk. Loss of snags and large old trees for nesting and roosting must be important. Pesticide use is a potential problem.

GREAT HORNED OWL - *Bubo virginianus*
Stat: R **West:** fR,uT. **East:** fR,uT.
Dist: T **West: N:**F-9; **T**:F-10; **W**:F-9. **East: N:**B-9; **T:**B-10; **W:**B-9.
Sign: CONT-1. **Ssp.** *pacificus* - CAL-10.
Hab: R: 3-MHW,MHC,PPN,MCN,EPN,MRI,BAR,RSP; 2-DFR,JPN,RFR,LPN,ASP,PJN,JUN.
F: 3-MHW,MHC,PPN,DFR,MCN,EPN,MRI,WTM,PAS,BAR,RSP; 2-JPN,RFR,LPN,ASP, PJN,JUN.
F: Occurs in an extremely wide variety of habitats but seems to shun dense old-growth mid-elevation forests and densely vegetated mid-elevation meadows.
Abundance: BBS: 4 routes; 0.06 birds/route. **MAPS:**
Trends: BBS: UN; -3.9% per year
Potential risks and suggested causes of population trends: Shooting "vermin" is still probably a risk. Loss of prey base and pesticide use are risks. Increased residential and agricultural development are important risks, although the species often thrives close to human habitations. Harassment from increasing crow populations in the lowest foothills may be a risk.

NORTHERN PYGMY-OWL - *Glaucidium gnoma*
Stat: R-SDM **West:** uS,xT,iuW. **East:** rS,xT,irW.
Dist: T **West: N:**3-7; **T:**F-9; **W:**F-7. **East: N:**7-8; **T:**B-8; **W:**B-8.
Sign: WMT-6. **Ssp.** *californicum* - WTM-6; Grinnell and Miller (1944) distinguish *pinicola* on the East slope of the southern Sierra (and possibly on the East slope of the central Sierra as well) from *californicum* in the rest of the Sierra, but AOU (1957) did not recognize *pinicola*; if *pinicola* is recognized then subspecies become *californicum* - CAL-10 and *pinicola* - RM/GB-8.
Hab: R: 3-MHW,MHC,PPN,DFR,MCN,EPN,PJN,MRI,RSP.
F: 3-MHW,MHC,PPN,DFR,MCN,EPN,PJN,MRI,WTM,PAS,RSP; 2-MCP.
F: Favors open stands of black oaks, ponderosa pines, incense cedars, and white firs, but also occurs in sugar pines, sequoias, riparian

hardwoods, and abandoned orchards. Perhaps prefers edge or broken situations. Cavity nester.

Abundance: **BBS:** 5 routes; 0.14 birds/route. **MAPS:**
Trends: **BBS:** UN; 2.4% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of snags is the only important risk I can suggest. Maybe loss of black oaks is also important. I believe this species is declining but I don't know the cause.

I believe it has declined heavily since the days of Grinnell and Miller (1944) who rated it as common. It needs to be extensively studied.

SPOTTED OWL - *Strix occidentalis*

Stat: **R** **West:** uR,xT. **East:** xS*.
Dist: T **West:** **N:**3-6; **T:**3-7: **W:**3-6. **East:** **N:**8?.
Sign: WMT-6. Actually a composite of PAC-7 and SW-9. **Ssp.** *occidentalis* - PCAL-11. The Sierra Nevada offers the only extensive, nearly continuous habitat existing for this subspecies, the California Spotted Owl, which has been designated by the USDI Fish and Wildlife Service as a "Candidate 2" species with its population in documented decline, and by the California Department of Fish and Game as a "Species of Special Concern". As such the Sierra population is of critical importance for protecting this subspecies. In addition, considering that the Northern Spotted Owl, subspecies *caurina*, is already listed as "Federally Threatened" and the Mexican Spotted owl, subspecies *lucida*, may also be in serious trouble, the Sierran population of the Spotted Owl is of extreme importance for the conservation of the entire species.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,RFR,MRI; 2-LPN,EPN.
F: 3-MHW,MHC,PPN,DFR,MCN,RFR,MRI; 2-LPN,EPN.
F: Prefers dense, multilayered old-growth forests especially on shady slopes or in canyonbottoms. Often includes a hardwood element but also occurs in the absence of hardwoods. Seems to reach maximum **Abundance** at elevations below the red fir zone.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species is being extensively studied so I can't add much to the discussion (see Verner et al. 1992). Habitat change due to logging is the major threat. Maintaining an even distribution of birds should be the major management action. Loss of old-growth forest and fragmentation of all mature forests are, perhaps, the biggest threats.

GREAT GRAY OWL - *Strix nebulosa*

Stat: **R** **West:** rS,xT,rW. **East:**
Dist: C **West:** **N:**4-7; **T:**3-10; **W:**3-5. **East:**
Sign: CAN/WMT-3. **Ssp.** *nebulosa* - CAN/WMT-3. Sierran population small and of little importance to the species. However, the entire California population of this species is located in the central Sierra; thus, the Sierra is all-important for the survival of the species in California.

Moreover, the Sierran population appears to be completely isolated from the next nearest population of this species which is in the Cascades of southern Oregon. The California population is by far the southernmost population of this species on Earth. A "California Endangered" species.
Hab: **R:** 3-MCN,RFR,LPN.
F: 3-MCN,RFR,LPN,WTM.
F: Requires extensive, densely-vegetated, wet or moist meadows margined by old-growth coniferous forest from the mixed conifer through the

red fir to the lower lodgepole zones. Prefers the tops of tall broken snags for nesting.

Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Grazing of mid-elevation meadows is the major threat and probable cause of its very low current population size. Grazing thins the vegetation and makes the meadow more attractive to Great Horned Owls, which tend to exclude Great Grays. Virtually California's entire population resides in Yosemite NP where grazing is not permitted. Yet, in winters of heavy snowfall, the birds must move out of the Park to nearby lower elevation meadows. Grazing on these wintering meadows must be prohibited if the population is to survive. Eliminating grazing on Sierran meadows overall would be one of the best possible management actions to enhance all species of Sierran landbirds and reverse their population declines. Disturbance by humans (birders) at the Great Gray's Yosemite nesting haunts is a risk.

LONG-EARED OWL - *Asio otus*

Stat: **R**-SDM **West:** rS,rT,rW. **East:** luS,rT,rW.
Dist: T **West:** **N:**F-6?; **T:**F-10; **W:**F-5?. **East:** **N:**B-8; **T:**B-10; **W:**B-7.
Sign: CONT-1. **Ssp.** *tuftsi* - **WEST**-4; **West** slope Sierran population very small and of little significance to the species; East slope population larger and of considerably greater significance. However, because the overall population in California is very small, all Sierran birds are of great importance to the California population.
Hab: **R:** 3-MRI; 2-MHC,PPN,MCN,EPN,JUN.
F: 3-MRI,WTM,MCP,PAS; 2-MHC,PPN,MCN,EPN,JUN.
F: Habitat requirements not well-understood. On the West slope may prefer riparian and oak-conifer forests. On the East slope utilizes eastside pine and juniper habitats as well as riparian situations. Utilizes old Magpie nests.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Has decreased significantly in California in historic times; Grinnell and Miller (1994) considered them to be "common" or even "abundant" locally, but noted that the species was already declining. Loss of riparian habitat, especially arborescent riparian vegetation, is probably the major threat. But who know anything about this species in the Sierra? Not me. Do they fall victim to increasing numbers of Great Horneds? How is their prey base? This species needs to be thoroughly studied.

NORTHERN SAW-WHET OWL - *Aegolius acadicus*

Stat: **R**-SDM **West:** rR,xT. **East:** rR,rT.
Dist: T **West:** **N:**4-6?; **T:**4-8?; **W:**4-6?. **East:** **N:**6-8?; **T:**6-10?; **W:**6-8?.
Sign: CAN/WMT-3. **Ssp.** *acadicus* - CAN/WMT-3. Sierran population is presumably quite small and of relatively little significance to the species.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,LPN,EPN,MRI; 2-JPN,RFR,PJN,JUN.
F: 3-MHW,MHC,PPN,DFR,MCN,LPN,EPN,MRI; 2-JPN,RFR,ASP,PJN,JUN,WTM.
F: Very poorly known in the Sierra. Probably prefers dense oak-conifer forest but may also occur in pure conifer forest. May nest in eastside pine forest on the East slope. Cavity nester.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Another mystery

species. Loss of snags is probably important. Do they use oaks? If so, loss of black oaks could be a major risk.

COMMON NIGHTHAWK - *Chordeiles minor*
Stat: NTM **West:** rS,rT. **East:** rS,rT.
Dist: T **West: N:**F-10?; **T:**F-12. **East: N:**B-8; **T:**B-11.
Sign: CONT-1. **Ssp.** *hesperis* - WUS-5. Populations in the Sierra are small and of very little significance to the species. The species becomes common east of the eastern base of the Sierran escarpment.
Hab: **R:** 3-MHC,MCN,BAR; 2-PPN,JPN,EPN,PJN,JUN,MCP,RSP.
F: 3-MHC,PPN,DFR,MCN,JPN,RFR,EPN,PJN,JUN,WTM,MCP,PAS,BAR,RSP.
F: Needs large gravelly openings in forested country or open country itself for nesting. Generally hunts over water, meadows, sagebrush scrub, or open coniferous forest.
Abundance: BBS: 9 routes; 0.85 birds/route. **MAPS:**
Trends: BBS: DT; -2.1% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: I believe this species has declined drastically in the Sierra since days of Grinnell and Miller (1944) and is still declining. Loss of upslope-wind-drifted large insects form the Central Valley and Great Basin due to agricultural development and pesticide use could be the major factor. Similar factors on the winter range could be a problem. Also, nest disturbance and trampling by grazing cattle could be problem. Further study is warranted.

COMMON POORWIL - *Phalaenoptilus nuttallii*
Stat: SD-NTM **West:** fS,rT **East:** fS,rT.
Dist: T **West: N:**F-6; **T:**F-10. **East: N:**B-8; **T:**B-10.
Sign: WUS-5. **Ssp.** *californicus* west slope - CAL-10; *nuttallii* east slope - WUS-5.
Hab: **R:** 3-PJN,JUN,BAR; 2-MHW,MHC,EPN,MCP.
F: 3-PJN,JUN,BAR; 2-MHW,MHC,EPN,MCP.
F: Generally prefers rather open chaparral or quite open oak woodland or coniferous forest, generally on the edges of open space, clearings, or roads. An open mixture of shrubs and small trees seems especially to their liking.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: May be increasing in the Sierra. Risks are hard to suggest. A general decrease in large flying insects due to adverse weather and pesticide use could be a risk. Logging may be benefiting this species.

BLACK SWIFT - *Cypseloides niger*
Stat: NTM **West:** luS,rT. **East:** rT.
Dist: T **West: N:**4-7; **T:**4-13. **East: T:**9-13.
Sign: PAC-7. **Ssp.** *borealis* - PAC-7. Also occurs sparingly in Rocky Mts. Because the species is uncommon or rare and irregularly distributed throughout its range, the Sierra population is of considerable importance to the species.
Hab: **R:** 3-MHC,MCN,DFR,JPN,RFR,LPN,MRI,BAR.
F: 3-MHC,MCN,DFR,JPN,RFR,LPN,MRI,MCP,BAR; 2-RSP.
F: Requires sheer, well-shaded cliffs, often beside or behind waterfalls, for nesting. The species is probably a "cloud swift" that requires complex moving airmasses for foraging.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:

Potential risks and suggested causes of population trends: I believe that this species, although always local and uncommon, may be declining. A reduction in wind-borne insects from lower elevations due to agricultural development and pesticide use may be a problem, especially because it is apparently a "cloud swift" that specializes in such prey. Similar considerations in the tropics may also exist. Disturbance at certain more accessible nests may also be a risk. Needs study.

VAUX'S SWIFT - *Chaetura vauxi*

Stat: NTM **West:** rS,rT. **East:** xS*,rT.
Dist: T **West:** **N:**4-7; **T:**F-4. **East:** **N:**7?; **T:**B-8.
Sign: PAC-7. **Ssp.** *vauxi* - PAC-7. Sierra population small and relatively unimportant to the species.
Hab: **R:** 3-DFR.
F: 3-DFR,RSP; 2-MHW,MHC,PPN,MCN,RFR,WTM,MRI.
F: Prefers mid-elevation old-growth forests, probably at the edges of wet meadows. Requires large hollow snags and trees for nesting.
Abundance: **BBS:** 3 routes; 0.10 birds/route. **MAPS:**
Trends: **BBS:** UN; -10.7% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: The same factors regarding food supply that apply to Black Swift may apply to this species, although it may not be such a "cloud swift". Perhaps more important is the loss of large snags at the edges of mid-elevation wet meadows for nest sites. The grazing of these meadows may speed their drying and disappearance and may be a risk.

WHITE-THROATED SWIFT - *Aeronautes saxatalis*

Stat: SD-NTM **West:** cS,rT,uW. **East:** luS,uT.
Dist: T **West:** N:**F**-8; T:**F**-13; W:**F**-3. **East**: N:B-9; **T:**B-13.
Sign: WUS-5. **Ssp.** *saxatalis* - WUS-5.
Hab: **R:** 3-MHW,MHC,PPN,MCN,LPN,EPN,MRI,MCP,BAR.
F: 3-MHW,MHC,PPN,DFR,MCN,LPN,EPN,MRI,BAR,RSP; 2-JPN,RFR,ASP,PJN,JUN, WTM,MCP.
F: Requires sheer cliffs (usually granite) for nesting. Undergoes winter torpor.
Abundance: **BBS:** 5 routes; 0.63 birds/route. **MAPS:**
Trends: **BBS:** DT; -26.4% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: The fact that BBS data suggest both Vaux's and White-throated swifts, which have very disparate nesting habits, may be declining (though the small sample size for Vaux’s Swift prevents classification of its trend) suggests that the problem
lies with the reduction of the prey base. Since most White-throateds winter in the temperate zone while Vaux's winter in the tropics, the problem may be right here.

BLACK-CHINNED HUMMINGBIRD - *Archilochus alexandri*

Stat: NTM **West:** rS,xT. **East:** rS,xT.
Dist: T **West:** N:**F**-4?; T:**F**-8. **East:** **N:**B-7?; **T:**B-10.
Sign: WUS-5. A species of lowland valleys and foothills in California. Sierran breeding population is miniscule and of virtually no significance to the species.
Hab: **R:** 3-RSP.
F: 3-RSP.
F: Prefers arborescent riparian habitat, at least for nesting.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**

Potential risks and suggested causes of population trends: Who knows anything about this bird in the Sierra? Peak of abundance is probably in the arborescent riparian habitat at the very base of the West slope. Thus, loss of riparian habitat is the major threat. I believe this species has declined substantially since Grinnell and Miller's (1944) days, probably due loss of riparian forests in the floor and along the edges of the Central Valley. Is competition with the larger, increasing Anna's Hummingbird a risk?

ANNA'S HUMMINGBIRD - *Calypte anna*

Stat: SDM **West:** lfS,ifT,lfW. **East:** rT.
Dist: T **West: N:**F-4; **T:**F-10; **W**:F-2. **East: T:**B-10.
Sign: PAC-6. Breeding population in Sierra small is and is of less importance than many other PAC-6 species. However, substantial numbers disperse up-mountain into the Sierra during the summer when flowers mostly disappear from lowland California.
Hab: **R:** 3-RSP; 2-MHW,MHC,PPN,MCN,MRI,MCP.
F: 3-RSP; 2-MHW,MHC,PPN,MCN,MRI,MCP.
F: Prefers dry slopes with broken chaparral or open woodland, and, of course, abundant flowers. Attracted to human habitations and gardens.
Abundance: **BBS:** 9 routes; 0.19 birds/route. **MAPS:**
Trends: **BBS:** PI; 62.3% per year *
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species has probably increased since 1944 and is probably still increasing, due to its association with human gardens and feeders. I don't see many potential risks.

CALLIOPE HUMMINGBIRD - *Stellula calliope*

Stat: NTM **West:** lfS,ifT. **East:** lfS,ifT.
Dist: T **West: N:**4-10; **T:**F-10. **East**: N:6-10; **T:**B-10.
Sign: WMT-6. Absent as a breeder in most of southwest mountains and scarce in Canada, so Sierran importance is greater than for many WMT-6 species.
Hab: **R:** 3-MHC,DFR,MCN,JPN,LPN,ASP,EPN,MRI,RSP; 2-MHW,PPN,RFR,SCN.
F: 3-MHW,MHC,DFR,MCN,JPN,LPN,ASP,EPN,WTM,MRI,MCP,RSP; 2-PPN,RFR,SCN.
F: Prefers open habitats with scattered trees and shrubs but nesting sites may be in fairly dense forest. Male territories can be in moist or dry habitats on the west slope but usually limited to moist sites on East slope, perhaps because of the necessity for abundant flowers.
Abundance: **BBS:** 8 routes; 0.24 birds/route. **MAPS:**
Trends: **BBS:** UN; 1.3% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Invasion of its habitat by the larger, increasing Anna's is a risk; however, its habitat gets invaded every year by swarms of even more aggressive migrant Rufous Hummingbirds. Yet, Rufous Hummingbirds seem to be declining in the West. Perch hypothermia is a risk (feeders with perches that are left out at night when the temperature drops to near freezing -- the hummer tanks up on great quantities of very cold liquid first thing in the morning while resting on a perch and its body temperature drops to torpor and it falls of the perch only to be killed by cats and dogs -- sounds incredible? -- its a common phenomenon in Montana in the summer -- solution -- remove the perches and the heat generated by flight keeps the body temperature sufficiently high to avoid torpor -- does this happen at feeders at high elevations in the Sierra too?).

BROAD-TAILED HUMMINGBIRD - *Selasphorus platycercus*

Stat: NTM **West:** xT. **East:** lrS,rT.
Dist: C **West: T:**8. **East: N:**8-9; **T:**6-12.
Sign: RM/GB-8. **Ssp.** *platycercus* - RM/GB-86. Sierra population very small and insignificant to the species. However, this species is of very limited range in California, so the Sierra population is of considerable significance to the overall California population.
Hab: **R:** 3-MRI,MCP; 2-MCN,PJN.
F: 3-MRI,MCP; 2-MCN,PJN,WTM.
SP: Rare, local summer resident and presumed breeder on east slope of Sierra where they prefer open canyonsides usually near streams or other water.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species is apparently currently attempting to colonize the central east slope of the Sierra. As with other hummers (except Black-chinned) I don't see any obvious risks except perch hypothermia at high altitudes.

BELTED KINGFISHER - *Ceryle alcyon*
Stat: SDM **West:** uS,rT,uW. **East:** rS,rT,rW.
Dist: TW,NCE **West: N:**F-6; **T:**F-10; **W:**F-5. **East: N:**B-8; **T:**B-10; **W:**B-8.
Sign: CONT-1. **Ssp.** *caurina* - WEST-4. Kingfishers are relatively uncommon in the Sierra so the area is of relatively little importance to the species as a whole.
Hab: **R:** 3-MRI,BAR.
F: 3-MRI.
F: Requires streams, rivers, or lakes with fish; dirt banks for nesting.
Abundance: **BBS:** 4 routes; 0.15 birds/route. **MAPS:** 0.02 ad/600 nh
Trends: **BBS:** PD; -19.2% per year ***
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Why are kingfishers declining so fast in the Sierra? Are introduced trout eating the kingfisher-sized fish? Is there too much human disturbance along stream banks where they nest? Is stream channelization destroying nesting locations? Or is there just a general decline in fish populations? Being at the top of an aquatic food chain, they face the risk of pesticide accumulation up the food chain. This could well occur on wintering grounds in the Central Valley and is, perhaps, the most likely explanation.

LEWIS' WOODPECKER - *Melanerpes lewis*
Stat: SDM **West:** irS,irT,ifW. **East:** luS,irT.
Dist: TW,NCE **West: N:**F-5; **T:**F-10; **W:**F-2. **East: N:**7-8; **T:**B-10.
Sign: WEST-4. This species is primarily a denizen of lowland foothill oak woodland on the West slope and of Jeffery Pine forest East of the Sierra escarpment and is quite uncommon in the Sierra proper. Thus, the Sierra is of less importance to this species than most WEST-4 species. The species, however, is very local, irregular, and uncommon virtually everywhere in California, so all Sierran populations, even small ones, are of great importance to the overall California population.
Hab: **R:** 3-MHW,MHC,PPN,MCN,JPN,EPN,PJN,MRI.
F: 3-MHW,MHC,PPN,MCN,JPN,EPN,PJN,WTM,MRI; 2-JUN.
F: Requires open woodland as described in the WHR above. Often highly dependent upon acorns in winter. Attracted to orchards in fall migration.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**

Demographics: **MAPS:**
Potential risks and suggested causes of population trends: I believe that this species is declining. I especially believe that it has declined enormously since Grinnell and Miller (1944). Although it ranges widely and feeds extensively on flying insects, acorns are probably a mainstay, and oaks are a preferred winter habitat, at least on the West slope. Thus disappearance of oaks, especially attrition of large oaks for nest sites, is a risk, as are decreases in acorn production (see Band-tailed Pigeon). Usurpation of nest holes by introduced European Starlings is another very real risk. Loss of snags for lookout perches may also be a risk.

ACORN WOODPECKER - *Melanerpes formicivorus*
Stat: **R** **West:** cR,xT. **East:** lrR,xT.
Dist: TW,NE **West:** N:**F**-5; T:**F**-8; W:**F**-5. **East:** **N:**4; **T:**7-10; **W:**4.
Sign: SW-8. **Spp**. *bairdi* - CAL-10. The only breeding population on the East slope of the Sierra of which I am aware is a small population in Janesville, just south of Susanville.
Hab: **R:** 3-MHW,MHC,RSP; 2-PPN,MRI.
F: 3-MHW,MHC,PPN,MRI,RSP.
F: Intimately dependent upon oaks for their winter food stores. Generally favors open woodland or forest
Abundance: **BBS:** 7 routes; 1.76 birds/route. **MAPS:** 0.02 ad/600 nh
Trends: **BBS:** PD; -5.3% per year
Potential risks and suggested causes of population trends: Another acorn specialist that is rapidly declining. See Band-tailed Pigeon, Lewis' Woodpecker, and Scrub Jay. Usurpation of nest holes by starlings may also be a problem, but the communal nature of nesting Acorn Woodpeckers may allow them to defend their nests against starlings better Lewis' Woodpeckers and other non-communal nesters.

WILLIAMSON'S SAPSUCKER - *Sphyrapicus thyroides*
Stat: **R**-SDM **West:** uS,uT,uW. **East:** uS,uT,xW.
Dist: T **West:** **N:**7-9; **T:**6-10; **W:**4-6. **East:** **N:**7-9; **T:**6-10; **W:**7-8.
Sign: WUS-5. **Ssp**. *thyroides* - PAC-7. The whereabouts of East slope Williamson's Sapsuckers during the winter is a mystery. Apparently almost all of them migrate, presumably in a southeasterly direction.
Hab: **R:** 3-LPN,ASP,RSP; 2-[RFR].
F: 3-PPN,MCN,RFR,LPN,ASP,MRI,RSP; 2-JPN,EPN.
F: Occurs in a variety of habitats from dry, rocky, openly-wooded ridges to densely forested valley bottoms. Favored trees are lodgepole pines, white pines, mountain hemlocks, and jeffrey pines.

Apparently does not require hardwoods for sap.
Abundance: **BBS:** 3 routes; 0.06 birds/route. **MAPS:** 0.22 ad/600 nh
Trends: **BBS:** UN; -12.9% per year
Demographics: **MAPS:** Prod. index: 0.0% yg.
Potential risks and suggested causes of population trends: This species occurs in relatively open forest so logging operations may not hurt it as much as Red-breasted Sapsuckers. Loss of snags is an important threat. It does not feed on willow sap so grazing of meadows is not a risk. It thus seems clear that it faces fewer risks than Red-breasts; and, yet, it seems To be decreasing at, perhaps, even a faster rate than Red-breasts. Pesticide use on forest insect outbreaks may be a risk. The 0.0% productivity index is undoubtedly an artifact of small sample size. Still it is surprising that out of 12 Williamson's Sapsucker captured, we have never captured a young bird. Much needs to be learned about this species' winter whereabouts.

RED-NAPED SAPSUCKER - *Sphyrapicus nuchalis*
Stat: SDM **West:** xS*,rW. **East:** xS,rT,xW.

Dist: T **West: N:**7; **W:**F-4. **East: N:**9; **T:**B-9, **W:**B-7.
Sign: RM/GB-8. This species is an extremely rare breeder in the Sierra with only one confirmed breeding record (plus one record of a mixed *nuchalis-daggetti* pair). Thus, its Sierran range is insignificant to the species overall population.
Hab: **R:** 3-(MHW),MHC,MCN,ASP,EPN,MRI.
F: 3-(MHW),MHC,MCN,ASP,EPN,MRI,RSP; 2-LPN,(SCN),PJN,JUN.
F: Habitat requirements probably like Red-breasted Sapsucker but possibly more dependent upon riparian, aspen, and other hardwoods during the nesting season.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: We know next to nothing of this species in the Sierra. However, its is so much like Red-breasted Sapsucker that what is written there may apply here.

RED-BREASTED SAPSUCKER - *Sphyrapicus ruber*
Stat: SDM **West:** fS,iuT,uW. **East:** cS,iuT,xW.
Dist: T **West: N:**4-8; T:**F**-10; W:**F**-4. **East: N:**6-10; **T:**B-10, **W:**B-6.
Sign: PAC-7. **Ssp.** *daggetti* - CAL-10. The Sierra represents the metropolis of this subspecies range and is of extreme importance to the subspecies as a whole.
Hab: **R:** 3-MHW,MHC,DFR,MCN,JPN,RFR,LPN,ASP,EPN,MRI,RSP; 2-PPN,PJN,JUN.
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,ASP,EPN,PJN,JUN,MRI,RSP.
F: Requires hardwoods for sap (and often for nesting) but occurs commonly in mixed or even pure coniferous forest provided willow thickets are available for a sap source. In such situations they become very dependent on the small willows that occur in montane meadows. On the East side they often nest in aspen or riparian woodland in the complete absence of conifers, but do not breed on the West slope in the absence of conifers.
Abundance: **BBS:** 16 routes; 1.61 birds/route. **MAPS:** 3.34 ad/600 nh
Trends: **BBS:** PD; -2.8% per year
Demographics: **MAPS:** Prod. index: 34.3% yg.
Ann. surv. rate: 0..581 (0.214);
Cap. prob.: 0.340 (0.400).
Potential risks and suggested causes of population trends: BBS data suggest that this species may be in trouble in the Sierra. We capture large numbers at MAPS stations located on the edges of wet meadows, but all meadows where we have MAPS stations are entirely or virtually free of grazing. The birds are attracted to sap wells that they dig in the large willow clumps in the meadows. Grazing tends to denude willows of their lower foliage and could adversely affect the quantity or quality of the sap produced. This hypothesis deserves serious study. Red-breasted Sapsuckers also tend to prefer dense forest, often rather young stands as well as more mature growth. I don't particularly associate them with old growth, however. I suspect that logging practices that open up the forest are detrimental to Red-breasts. To me, the greatest evidence of declines is on wintering grounds in central coastal California where they are becoming much scarcer than they formerly were. Could the cause of decline be on the wintering grounds? Like all woodpeckers, loss of snags could also be a problem. Pesticide use on forest insect outbreaks could be a risk. Perhaps sapsuckers are suffering on both the breeding and wintering grounds. Certainly, this is a key critical species that deserves much study in the Sierra. I believe it can tell us much about problems that Sierran birds face, particularly grazing of meadows and logging of forests, two of the most important threats to Sierran landbirds.

NUTTALL'S WOODPECKER - *Picoides nuttallii*

Stat: **R** **West:** fS,rT,ifW. **East:** irT.
Dist: T **West:** N:F-3; **T:**F-8; **W:**F-4. **East:** **T:**B-7.
Sign: CAL-10. This species is primarily a denizen of the lower foothills and lowland valleys West of the Sierra. Thus, the Sierra proper is not as important to the overall species' range as it would be if it were more widely distributed in the Sierra.
Hab: **R:** 3-MRI; 2-MHW,MHC.
F: 3-MHW,MHC,MRI; 2-PPN,MCN,RSP.
F: Favors blue and live oaks and riparian forests. From late summer through winter some move into higher mixed conifer forests.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of oak woodland and tall foothill riparian habitat are the major risks. Seems to adapt well to residential areas, at least outside the breeding season. Usurpation of nest sites by starling is possible but Nuttall's nests may be too small for starlings. Pesticide use on forest insect outbreaks could be a risk when the species moves up into higher elevations.

DOWNY WOODPECKER - *Picoides pubescens*
Stat: **R** **West:** uR.rT. **East:** uR.
Dist: T **West:** **N:**F-4; **T:**F-9; **W:**F-4. **East:** **N:**B-7; **W:**B-7.
Sign: CONT-1. **Ssp**. *turati* - PAC-7. Because this subspecies is replaced by *gairdneri* in the western portions of Washington, Oregon, and northwestern California, its Sierran range is of greater importance than for most PAC-7 subspecies. However, because the species is uncommon and limited to lower elevations in the Sierra, the importance of the Sierra to the subspecies' overall range is small.
Hab: **R:** 3-ASP,MRI,[RSP]; 2-MHW,MHC.
F: 3-ASP,MRI,[RSP]; 2-MHW,MHC,PPN,DFR,MCN,JPN,(RFR),(LPN),EPN.
F: Prefers riparian forests and woodlands (and aspen on the East slope). Only rarely utilizes upland oak woodland, mixed oak-conifer forest, or conifer forest. Requires wood in advanced decay for nesting cavities.
Abundance: **BBS:** 8 routes; 0.23 birds/route. **MAPS:** 0.17 ad/600 nh
Trends: **BBS:** UN; -1.0% per year
Demographics: **MAPS:** Prod. index: 18.9% yg.
Potential risks and suggested causes of population trends: Loss of riparian habitat is the biggest risk. Loss of snags may be important as they require decaying wood for nest holes. Pesticide use on forest insect outbreaks could be a risk when the species moves up into higher elevations. Low MAPS productivity is probably an artifact of small sample size.

HAIRY WOODPECKER - *Picoides villosus*
Stat: **R** **West:** fS,ifW. **East:** fR.
Dist: T **West:** **N:**3-10; **W:**3-10. **East:** **N:**B-10; **W:**B-10.
Sign: CONT-1. **Ssp**. *orius* northern Sierra north of Yosemite region- PAC-7; *hyloscopus* southern Sierra from about Yosemite southward - CAL-10. Because *orius* is replaced by *harrisi* in the western portions of Washington, Oregon, and northwestern California, its Sierran range is of greater importance than for most PAC-7 subspecies. Overall, the Sierra is of substantial importance for both subspecies.
Hab: **R:** 3-MHW,MHC,PPN,MCN,JPN,LPN,SCN,ASP,EPN,MRI,[RSP]; 2-DFR,RFR.
F: 3-MHW,MHC,PPN,MCN,JPN,LPN,SCN,ASP,EPN,MRI,[RSP]; 2-DFR,RFR.
F: Mature timber and dead snags or trees of moderate to large size are more important than tree species.
Abundance: **BBS:** 15 routes; 1.63 birds/route. **MAPS:** 0.69 ad/600 nh

Trends: BBS: LS; 0.9% per year
Demographics: MAPS: Prod. index: 37.2% yg.
Potential risks and suggested causes of population trends: Hairy Woodpeckers prefer rather mature forests with large trees, so logging operations can be detrimental. Pesticide use on forest insect outbreaks could also be a risk, as could the removal of snags. Loss of riparian habitat may also be a risk. Overall they seem to face fewer risks than Red-breasted Sapsuckers but more than White-headed Woodpeckers; and their population trend is intermediate between the decline of sapsuckers and the increase of White-heads.

WHITE-HEADED WOODPECKER - *Picoides albolarvatus*
Stat: R **West:** fR. **East:** rR,rT.
Dist: T **West: N:**4-8; **W:**4-8. **East: N:**7-9 **T:**7-10, **W:**7-9.
Sign: PAC-7. **Ssp**. *albolarvatus* - PAC-7. This species may be more common in the Sierra than in any other part of its range. Thus, the Sierra is of great importance to the species' overall population.
Hab: R: 3-PPN,MCN,JPN,EPN; 2-MHC,RFR,LPN,[RSP].
F: 3-PPN,MCN,JPN,EPN; 2-MHC,RFR,LPN,[RSP].
F: Prefers mature mixed coniferous forest with trees of moderate to large size, but also occurs commonly in more open ponderosa and jeffrey pine forest and less commonly in more closed red fir forest and eastside jeffrey pine forest.
Abundance: BBS: 15 routes; 1.81 birds/route. **MAPS:** 0.66 ad/600 nh
Trends: BBS: PI; 3.7% per year
Demographics: MAPS: Prod. index: 4.1% yg.
Potential risks and suggested causes of population trends: This species prefers more open forest than either Red-breasted Sapsuckers or Hairy Woodpeckers and its population trend shows an increase. Logging operations are, thus, probably beneficial to this species. Pesticide use on forest insect outbreaks could be a risk, as could the removal of snags. Comparative study of the woodpeckers as a function of management practice could reveal important information.

BLACK-BACKED WOODPECKER - *Picoides arcticus*
Stat: R **West:** luR,xT. **East:** xT.
Dist: NC **West: N:**7-9; **T:**4-9; **W:**7-9. **East: T:**8-10.
Sign: CAN/WMT-3. This species occurs in western mountains only south to central California and northern Wyoming and is generally uncommon everywhere. Thus its Sierran range may be more important to the species than most CAN/WMT-3 species. The central and northern Sierra seems to be the metropolis of the species range in California and thus is extremely important for the entire California population.
Hab: R: 3-LPN,(SCN).
F: 3-LPN,(SCN); 2-RFR.
F: Prefers lodgepole pines and, less commonly, red firs, white pines, and mountain hemlocks. Contrary to the WHR, I have not found the species in subalpine conifers. They are partial to areas infected with larval bark insects and often occur most commonly in recently defoliated or burned areas.
Abundance: BBS: 4 routes; 0.09 birds/route. **MAPS:** 0.01 ad/600 nh
Trends: BBS: UN; 14.9% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: Despite the few routes on which this species has been recorded, the increasing population trend may be real. If so, the increase could be due the relatively recent outbreaks of larval bark beetles that may have been promoted by recent occurrences of fire and drought. Pesticide use on forest insect outbreaks could be an important risk, but snag removal may not be a problem as Black-backs almost invariably nest in live trees. This also could account for the lack of a decrease. This unique species deserves concerted study.

NORTHERN FLICKER - *Colaptes auratus*
Stat: SDM **West:** fS,rT,ifW. **East:** fS,rT,ifW.
Dist: T **West:** **N:**F-10; **T:**F-13; **W:**F-5. **East**: N:B-10; **T:**B-13; **W:**B-8.
Sign: CONT-1. Spp. collaris - WEST-4.
Hab: **R:** 3-MHW,MHC,PPN,MCN,JPN,ASP,EPN,MRI,RSP; 2-DFR,LPN,PJN,JUN.
F: 3-MHW,MHC,PPN,MCN,JPN,ASP,EPN,MRI,PAS,RSP; 2-DFR,LPN,PJN,JUN,WTM, MCP.
F: Extremely widespread but always requires some open area for ground foraging.
Abundance: **BBS:** 17 routes; 5.93 birds/route. **MAPS:** 0.28 ad/600 nh
Trends: **BBS:** DS; -0.5% per year
Demographics: **MAPS:** Prod. index: 32.5% yg.
Potential risks and suggested causes of population trends: Logging operations may have little effect on flickers which often tend to avoid forested areas, both closed and open. Similarly, pesticide use on forest insect outbreaks is unlikely to be a risk as flickers do not seem to concentrate at such outbreaks. Snag removal remains a risk. Otherwise, risks are hard to suggest for this adaptable species. And indeed, the flicker is one of only five Sierran landbirds that seems to have a definitely relatively stable population trend. Productivity seems to be similar to other woodpeckers.

PILEATED WOODPECKER - *Dryocopus pileatus*
Stat: R **West:** uR,rT. **East:** xT.
Dist: T **West:** **N:**3-7; **T:**3-9; **W:**3-7. **East:** **T:**7-8.
Sign: CAN/EUS-3. **Ssp**. *picinus* - PAC-7. The Sierra represents an important part of the species' California range.
Hab: **R:** 3-MHC,PPN,DFR,MCN,JPN,RFR,(LPN); 2-MHW.
F: 3-MHC,PPN,DFR,MCN,JPN,RFR,(LPN); 2-MHW.
F: Generally requires old-growth forest with an Abundance of large, decayed, standing and fallen timber. The size and state of the trees seems to be more important than tree species.
Abundance: **BBS:** 11 routes; 0.59 birds/route. **MAPS:**
Trends: **BBS:** DT; -2.6% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species may be changing its habitat requirements in the Sierra, as it has done over most of the continent, to become more tolerant of second growth forests. Regardless, however, the forests still need to be relatively dense and closed and contain considerable dead wood. It is not surprising, therefore, that this species continues to show a decreasing tendency. Pesticide use on forest insect outbreaks could be a risk and snag removal is most definitely a risk.

OLIVE-SIDED FLYCATCHER - *Contopus borealis*
Stat: NTM **West:** fS,uT. **East:** uS,rT.
Dist: T **West:** **N:**3-9; **T:**F-10. **East:** **N:**7-9; **T:**B-10.
Sign: CAN/WMT-3.
Hab: **R:** 3-MHC,DFR,MCN,JPN,RFR,LPN.
F: 3-MHC,DFR,MCN,JPN,RFR,LPN; 2-MHW,PPN,SCN,ASP,EPN,MRI.
Sp: Requires very tall trees with dead perches at their very top. If such are present, will occur atop trees in dense forests or more open woodlands. Because of their height requirements, tall conifers generally must always be present.
Abundance: **BBS:** 17 routes; 12.37 birds/route. **MAPS:** 0.29 ad/600 nh
Trends: **BBS:** DD; -3.8% per year ***
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Here is another

species that is definitely decreasing in the Sierra and over its entire range (DeSante and George 1994). Marshall (1988) suggested that deforestation on its wintering grounds is the probable cause and I concur with this assessment. Not only has its Central American wintering grounds (where Sierran birds probably winter) been heavily impacted, the metropolis of its winter range on the East slope of the Andes in northern South America lies in the heart of the coca production area of South America. This species may, therefore, be an indirect casualty of cocaine abuse. Loss of old-growth forests and snags on the breeding range may also be a risk as might the effects of pesticides on large flying insects on both the breeding and wintering ranges. This is a species that must be closely monitored. It is a federal Candidate 2 species.

WESTERN WOOD-PEWEE - *Contopus sordidulus*

Stat: NTM **West:** cS,uT. **East:** cS,rT.
Dist: T **West: N:**3-9; **T:**F-10. **East: N:**B-9; **T:**B-10.
Sign: WEST-4. **Ssp.** *veliei* - WEST-4.
Hab: **R:** 3-MHW,MHC,PPN,MCN,JPN,RFR,LPN,ASP,EPN,(PJN),MRI; 2-DFR.
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,ASP,EPN,(PJN),MRI,RSP.
Sp: Very widespread but requires conspicuous lookout posts in an open mid-story beneath the canopy for foraging. Shuns only the interior of very dense forests but inhabits openings and the edges of such forests. In my experience tends to avoid pinyon-juniper on the East slope.
Abundance: **BBS:** 17 routes; 22.63 birds/route. **MAPS:** 2.62 ad/600 nh
Trends: **BBS:** DD; -2.9% per year ***
Demographics: **MAPS:** Prod. index: 24.9% yg.
Potential risks and suggested causes of population trends: Here is another decreasing Neotropical migrant that winters virtually entirely in South America. Again, I suspect deforestation on the winter grounds in the area where Sierran birds winter to be the major risk, as the species may be increasing over much of its breeding range (DeSante and George 1994). If the causes of decline of the species in the Sierra lie on the breeding range, they are a mystery to me as I can not easily identify risks that the species might face. A general reduction in the total amount of forested area due to logging is all that comes to mind. Like most flycatchers, its MAPS productivity index is low. However, it is the lowest of the seven Sierran flycatcher sampled by the MAPS program, so maybe something is going on in the Sierra. This is a species to watch.

WILLOW FLYCATCHER - *Empidonax traillii*

Stat: NTM **West:** lrS,xT. **East:** lrS,xT.
Dist: T **West: N:**4-7; **T:**4-8. **East: N:**B-8; **T:**B-10.
Sign: US-2. **Ssp.** *brewsteri* - PAC-7. The *brewsteri* subspecies is currently classified by the USDI Fish and Wildlife Service as a Federal Candidate 2 species and by the California Department of Fish and Game as an Endangered Species in California. Its population in the Sierra has decreased drastically over the past 50-60 years and it is now on the brink of extinction in the Sierra. The subspecies *extimus* occurs in the Kern River Valley, just outside of the area covered by this analysis. It is also listed as Endangered in California and has been formally proposed for listing as a Federal Endangered species. Without question, the Willow Flycatcher is the most endangered landbird species in the Sierra.
Hab: **R:** 3-MRI.
F: 3-WTM,MRI.
Sp: Wedded to willows in the Sierra. Requires large shrubby willows that line slow-moving streams in open meadow situations or that scatter about seeps in moist meadows. Definitely prefers clumps of willows to dense continuous thickets and prefers shrubby rather than

arborescent willows.

Abundance: **BBS:** **MAPS:** 1.23 ad/600 nh

Trends: **BBS:**

Demographics: **MAPS:** Prod. index: 35.6% yg.

Potential risks and suggested causes of population trends: Here is a species that has all but disappeared from the Sierra. The cause for its decline seems clearly to be the browsing of the willows by livestock in the montane meadows that it requires for breeding. Serena (1982) showed that the species does not occur in willows if the lower foliage has been denuded by livestock. In meadows where it does breed, which are always meadows where there is no grazing, the species still seems to be reproducing well. The productivity index for the Sierra from MAPS data (35.6% yg.) is at least as high as those for Western Wood Pewee (24.9%), Hammond's Flycactcher (27.6%), and Dusky Flycatcher (33.0%). The similarity to Dusky Flycatcher is important as the two species often nest side-by-side in nearby willow patches in the same meadows.

In the humid coast ranges of Oregon and Washington, Willow Flycatchers have apparently responded well to the red alder thickets that spring up on lower level montane hillsides after clearcutting (pers. observ.). As a result, Willow Flycatchers seem to be doing well in coastal Oregon and Washington, despite the possibility that they may face similar grazing problems in willow meadow habitats there. Because of drier conditions, such growths of red alder do not occur after clearcutting in the Sierra. Moreover, Sierran Willow Flycatchers seem to shun the mountain alder thickets that choke streamsides in wooded areas of the Sierra. Rather, they seem to be entirely wedded to the open clumps of willows in Sierran meadows. The complete elimination of grazing in montane meadows in the Sierra may offer the only hope for preserving this vanishing part of the Sierran avifauna.

HAMMOND'S FLYCATCHER - *Empidonax hammondii*

Stat: NTM **West:** cS,uT. **East:** rT.

Dist: T **West:** **N:**3-8; **T:**F-10. **East:** **T:**B-10.

Sign: WMT-6.

Hab: **R:** 3-MHC,(PPN),DFR,MCN,(JPN),RFR,RSP; 2-MRI.

F: 3-MHW,MHC,(PPN),DFR,MCN,(JPN),RFR,MRI,RSP.

Sp: Requires deeply shaded foliage beneath the canopy of large conifers. Favored trees are white and red firs, sugar pines, Douglas firs, and sequoias. Contrary to WHR I find them much less commonly in ponderosa pines and jeffrey pine forests. Occurs in moderately dense late-stage second growth as well as old growth but always requires considerable canopy closure.

Abundance: **BBS:** 14 routes; 6.05 birds/route. **MAPS:** 2.68 ad/600 nh

Trends: **BBS:** DS; -0.2% per year

The definitely stable BBS trend for this species may be offset partially by a decrease in unidentified Empidonax over the years, as observers became more familiar with the diagnostic calls of Hammond’s and Dusky Flycatchers.

Demographics: **MAPS:** Prod. index: 27.6% yg.

Potential risks and suggested causes of population trends: Because Hammond's Flycatchers prefer dense closed forests at mid-elevations in the Sierra, one would expect that logging of all kinds would be detrimental to their existence. Thus the definitely stable trend for this species comes as a surprise. One would also expect that, more than most species, they would also be subject to similar risks in the tropics. Problems, however, do not seem to be widespread on the wintering grounds as the species shows high annual survival rates. What is it that allows this species to survive and even thrive in Sierran and, apparently, Mexican forests as well? Or could the apparent increasing trend be completely an artifact of recent advances in the understanding of the vocalizations of this species? Indeed, the most

common call of this species, a sharp Pygmy Nuthatch-like "pip" or "peek", was not widely appreciated by birders until the 1980s. Controlled studies of the population trends in this species are needed.

GRAY FLYCATCHER - *Empidonax wrightii*

Stat: NTM **West:** lrS?,rT. **East:** luS,uT.
Dist: SW,TE **West: N:**7?; **T:**4-7. **East: N:**B-8; **T:**B-8.
Sign: RM/GB-8. Gray Flycatchers are generally rare on the east slope of the Sierra, becoming more common east of the Sierran escarpment. They may also nest on the Kern Plateau on the west slope of the southern Sierra.

Thus, the Sierra is less important to their overall population than for other RM/GB-8 species.
Hab: **R:** 3-PJN,JUN; 2-[EPN].
F: 3-PJN,JUN; 2-[EPN].
Sp: Requires large, dense-foliaged shrubs, usually sagebrush, bitterbrush, or junipers, sometimes amidst very scattered pinyons or eastside jeffrey pines.
Abundance: BBS: **MAPS:** 0.24 ad/600 nh
Trends: BBS:
Demographics: MAPS: Prod. index: 77.2% yg.
Potential risks and suggested causes of population trends: The high productivity index for this species is an artifact of the near lack of breeding habitat at the single MAPS station at which it occurs and the attractiveness of the willow habitat there to dispersing juveniles. No obvious threats come to mind other than grazing on its breeding habitat (it is unclear how this species responds to grazing) and degradation of its northern Mexican brushland wintering habitat.

DUSKY FLYCATCHER - *Empidonax oberholseri*

Stat: NTM **West:** fS,rT. **East:** fS,uT.
Dist: T **West: N:**4-10; **T:**F-10. **East: N:**7-10; **T:**B-10.
Sign: WMT-6.
Hab: **R:** 3-MHC,PPN,MCN,JPN,LPN,SCN,ASP,EPN,MRI,MCP; 2-RFR.
F: 3-MHC,PPN,MCN,JPN,LPN,SCN,ASP,EPN,MRI,MCP; 2-DFR,RFR.
Sp: At higher elevations, prefers open or broken lodgepole or subalpine forest particularly about meadows, clearings, and brushy slopes. At lower elevations, where perhaps less abundant, prefers montane chaparral intermixed with scattered trees or open forest. Also utilizes willow thickets, especially drier ones than preferred by Willow Flycatchers, riparian habitats, especially more open ones than preferred by "Western" Flycatchers, and aspen forests.
Abundance: BBS: 15 routes; 4.34 birds/route. **MAPS:** 9.35 ad/600 nh
Trends: BBS: PI; 6.1% per year
As with Hammond's Flycatcher, the observed trend for Dusky Flycatcher may have been distorted by the decreasing trend in unidentified *Empidonax*.
Demographics: MAPS: Prod. index: 33.0% yg.
Ann. surv. rate: 0.645 (0.147);
Cap. prob.: 0.546 (0.139).
Potential risks and suggested causes of population trends: Because this species prefers open, broken forest and scattered shrub cover, we might expect that some forestry practices might be beneficial to it. Furthermore, it seems to be more tolerant of grazing in montane meadows than the Willow Flycatcher as it breeds in willows in grazed meadows where Willow Flycatchers are absent. Indeed, I cannot easily identify any serious risks to it in the Sierra. Because of potential confusion of Hammond's and Dusky Flycatchers on BBS routes, especially during the early years of the Program, the increasing tendency of the species may not be accurate. However, it is worth noting that population levels of the species have remained remarkably

stable (despite marked year to year variations as result of snowpack [DeSante 1990]) for 17 years in a 1-km^2 subalpine study area in the Hall Natural Area of the Inyo National Forest (DeSante pers. observ.).

PACIFIC-SLOPE FLYCATCHER - *Empidonax difficilis*

Stat: NTM **West:** uS,rT. **East:** rT?.
Dist: T **West: N:**F-6; **T**:F-10. **East: T:**B-10?.
Sign: PAC-7. **Ssp.** *difficilis* - PAC-7. The "Western Flycatcher" has been split recently into two essentially allopatric species, the Pacific-slope Flycatcher on the West slope and the Cordilleran Flycatcher, which is presumably the species breeding in small numbers on the East slope. The status of Pacific-slope Flycatchers on the East slope is unknown. Presumably, most East slope migrants are Cordilleran Flycatchers but Pacific-slope Flycatchers from north of California probably migrate in substantial numbers east of the Sierra. Generally, however, "Western" Flycatchers of any kind are rare migrants on the east slope of the Sierra. Because the Pacific-slope Flycatcher is relatively uncommon in the Sierra, its importance there is less than some other PAC-7 species.
Hab: **R:** 3-MHC,PPN,MCN,JPN,LPN,SCN,ASP,EPN,MRI,MCP; 2-RFR.
F: 3-MHC,PPN,MCN,JPN,LPN,SCN,ASP,EPN,MRI,MCP; 2-DFR,RFR.
Sp: Requires dense, shady, moist mixed forest usually with maple and Douglas fir, or dense, shady forested canyonbottoms, often in the vicinity of running water. Requires a bank, structure, or tree roots or stump against which to place its nest.
Abundance: **BBS:** 9 routes; 0.84 birds/route. **MAPS:** 2.25 ad/600 nh
Trends: **BBS:** IT; 2.5% per year
Demographics: **MAPS:** Prod. index: 41.5% yg.
Potential risks and suggested causes of population trends: Risks include logging of dense, shady, mature Douglas fir forests, but the streamside canyon-bottom nature of its preferred habitat may provide a large measure of safety from logging operations. Deforestation and fragmentation of tropical winter habitat and pesticide use are also risks. MAPS productivity seems to be fine for a flycatcher, and, indeed, the species shows an increasing tendency.

CORDILLERAN FLYCATCHER - *Empidonax occidentalis*

Stat: NTM **West:** ?? **East:** rS,rT.
Dist: NC? **West:** ?? **East: N:**8-9; **T:**B-10.
Sign: RM/GB-8. See above under Pacific-slope Flycatcher. The status of the Cordilleran Flycatcher on the West slope is unknown. It is likely a very rare transient there if it occurs at all. To my knowledge, Cordilleran Flycatchers have not been recorded nesting south of Mammoth Lakes but this needs to be confirmed. Because this species is so rare in the Sierra, its importance there is less than some other RM/GB-8 species.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MRI,RSP.
F: 3-MHW,MHC,PPN,DFR,MRI,RSP.
Sp: Appears to require shady streamside groves of conifers and aspens. Nest requirements probably as in Pacific-slope Flycatcher but more work is needed here.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: I have no idea but suspect that risks would be similar to the Pacific-slope Flycatcher.

BLACK PHOEBE - *Sayornis nigricans*

Stat: R-SDM **West:** fR,xT. **East:** rT.
Dist: T **West: N:**F-5; **T:**F-9; **W:**F-4. **East: T:**B-10.

Sign: SW-9. **Ssp.** *semiatra* - SW-9. Because Black Phoebes are of limited Distribution in the Sierra, the Sierra is not of such great importance to this species as it could be for a SW-9 species.
Hab: **R:** 3-MRI,RSP.
F: 3-WTM,MRI,(BAR),RSP; 2-PAS.
Sp: Requires structures such as houses, sheds, or bridges for nest sites and, usually, the presence of water. even artificial water supplies.
Abundance: **BBS:** 2 routes; 0.03 birds/route. **MAPS:** 0.27 ad/600 nh
Trends: **BBS:** UN; 17.32% per year
Demographics: **MAPS:** Prod. index: 60.1% yg.
Potential risks and suggested causes of population trends: This species has adapted well to the human presence. Indeed, BBS data shows it increasing dramatically, though the trend cannot be classified due to low sample size. The species' MAPS productivity index also seems to be good for a flycatcher. Pesticide use, particularly around human settlements, may be a risk.

SAY'S PHOEBE - *Sayornis saya*
Stat: SDM **West:** rT,rW. **East:** rS?,rT.
Dist: T **West:** **T:**F-10; **W:**F-2. **East:** **N:**B-8?, **T:**B-10.
Sign: WEST-4. **Ssp.** *saya* - WEST-4. Say's Phoebes are rare transients and probably rare breeders on the East slope of the Sierra proper, but become uncommon breeders and fairly common transients east of the east base of the Sierran escarpment. They also breed in the arid lower foothills on the west slope of the Sierra. Because they are so rare in the Sierra, the Sierra is much less important to their overall population than it is for most WEST-4 species.
Hab: **R:** 3-PJN,JUN,MCP,BAR.
F: 3-PJN,JUN,PAS; 2-MCP,BAR.
Sp: Requires open country with scattered bushes, rocks, structures, or fences for lookout perches. Also requires rocks, cliffs, banks, or structures for nest placement.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species generally prefers remote arid breeding grounds and seems secure from virtually all risks on the breeding grounds. Widely-spaced ranch structures offer satisfactory nesting sites. I have no idea what is happening to this species on the margins of the Sierra where it occurs, but I am convinced that the species is declining in the Bay Area in winter. What's happening?

ASH-THROATED FLYCATCHER - *Myiarchus cinerascens*
Stat: NTM **West:** fS,xT. **East:** rS?,rT.
Dist: TW,SE **West:** N:F-5; **T:**F-10. **East:** **N:**B-7; **T:**B-8.
Sign: WUS-5. **Ssp**. *cinerascens* - WUS-5. Because this is primarily a species of the foothills, its Sierran range is less important to the species than many other WUS-5 species. This species apparently does not breed on the east slope of the Sierra except perhaps in the southern part. More information is needed regarding this.
Hab: **R:** 3-PJN,JUN,[MHW],[MHC].
F: 3-PJN,JUN,[MHW],[MHC].
Sp: Prefers open oak or pine-oak woodland (usually blue or live oaks and digger pines) with a scattered shrubby understory or chaparral slopes with scattered oaks or pines. Cavity nester.
Abundance: **BBS:** 6 routes; 0.32 birds/route. **MAPS:**
Trends: **BBS:** UN; 4.2% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of oak woodland or pinyon juniper breeding habitat, degradation of its large-insect

prey base by pesticides, and usurpation of nesting cavities by starlings are possible risks that are probably not realized. I believe they can evict and dominate starlings (at least at reasonable densities of starlings) and I believe that their rather remote, dry breeding habitat is currently fairly safe from development and pesticides. Pesticide issues on tropical wintering grounds, and loss of winter habitat may be more serious problems.

Still, the increasing tendency is probably real.

WESTERN KINGBIRD - *Tyrannus verticalis*

Stat: NTM **West:** fS,rT. **East:** rS.
Dist: T **West: N:**F-5; **T:**F-9. **East: N:**B-7.
Sign: WEST-4. This species primarily breeds in the lower foothills of the west slope and east of the east base of the Sierran escarpment. Thus, the Sierran population is of little importance to this widely Distributed western species.
Hab: **R:** 3-MHW,MHC,RSP.
F: 3-MHW,MHC,RSP; 2-WTM,PAS.
Sp: Requires open, flat or gently rolling terrain with scattered trees or fences and telephone wires for lookout perches, or open oak woodland (usually valley or blue oaks). Also occurs commonly in tall, open riparian woodland, usually cottonwoods or sycamores.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Residential and agricultural development of its valley foraging grounds, pesticide use affecting its large-insect prey base, and destruction of arborescent riparian and oak savannah breeding habitat are the obvious risks. Also, pesticide use on its wintering grounds could be an important risk. I believe that the foothill Sierran populations may be decreasing somewhat, but this is just a guess.

LOGGERHEAD SHRIKE - *Lanius ludovicianus*

Stat: SDM **West:** rT. **East:** uS,rW.
Dist: T **West: T**:F-9. **East: N**:B-7; **W**:B-7.
Sign: US-2. This species, however, has become very rare or locally extirpated over most of the eastern U.S., so the proper species' importance might better be WEST-4. **Ssp.** *gambeli* west slope (except extreme southern part) and northern portion of the east slope - WUS-5 (although perhaps better represented by a combination of RM/GB-8 and CAL-10); *nevadensis* central and southern portions of east slope and extreme southern portion of west slope - RM/GB-8. AOU (1957) did not recognize *nevadensis* and included this race in *gambeli*. If this taxonomy is followed then *gambeli* is best considered WUS-5. Regardless of taxonomy, Loggerhead Shrikes are only marginal breeders on the east slope of the Sierra (and possibly along the very lowest foothills of the west slope). The Sierra, therefore, constitutes an very unimportant part of their total range. However, because they seem to be declining over large portions of their range, their Sierran populations should be watched.
Hab: **R:** 3-PJN,JUN.
F: 3-PJN,JUN; 2-WTM,PAS,RSP.
Sp: Prefers arid grassland or other open country habitat with scattered large shrubs or trees for nest sites and fences or telephone wires for lookout perches.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: No population

trend data exist for the Sierra. However, populations of this species are declining over most of their range. Risks include loss of habitat to agricultural and residential development and possible decreases in or contamination of the prey base due to pesticides.

PLUMBEOUS VIREO - *Vireo plumbeus*
Stat: NTM **West**: **East**: lrS,rT.
Dist: CSE **West**: **East**: **N**:7-8; **T**:B-10.
Sign: RM/GB-8. Sierran populations of are very small and unimportant to the total range
Hab: **R**: 3-EPN,PJN,JUN,MRI; 2-ASP.
F: 3-EPN,PJN,JUN,MRI; 2-ASP,RSP.
Sp: Prefers dry, open stands of jeffrey or pinyon pines and junipers. Also occurs rarely in shady canyon bottoms.
Abundance: **BBS**: **MAPS**:
Trends: **BBS**:
Demographics: **MAPS**:
Potential risks and suggested causes of population trends: Virtually nothing is known about this species in the Sierra. Risks, however, are probably similar to Cassin's Vireo. Like that species, may be increasing in the Sierra.

CASSIN'S VIREO - *Vireo cassinii*
Stat: NTM **West**: fS,uT. **East**: luS,uT.
Dist: TW,NE **West**: **N**:3-7; **T**:F-10. **East**: **N**:5-8; **T**:B-10.
Sign: PAC-7 (but extends east across northern Rockies to western Montana); **Ssp**. *cassinii* - PAC-7 (but extends east across northern Rockies to western Montana). Sierran populations are relatively large so Sierra of considerable importance in it range.
Hab: **R**: 3-MHW,MHC,PPN,JPN,PJN,JUN,MRI; 2-DFR,MCN,RFR,ASP,EPN.
F: 3-MHW,MHC,PPN,JPN,PJN,JUN,MRI; 2-DFR,MCN,RFR,ASP,EPN,RSP.
Sp: On the west slope, prefers rather dry, open forests where black or canyon oaks mix with ponderosa pine or mixed coniferous forest, particularly with open branchwork at low and middle levels. Less common in moist, shady canyonbottoms and red fir forests. On the east slope, prefers dry, open stands of jeffrey or pinyon pines and junipers.
Abundance: **BBS**: 16 routes; 6.54 birds/route. **MAPS**: 2.60 ad/600 nh
Trends: **BBS**: DI; 4.0% per year **
Demographics: **MAPS**: Prod. index: 30.4% yg.
Potential risks and suggested causes of population trends: Risks include extensive logging, although certain forestry practices might not be deleterious. Like most vireos, seems highly susceptible to cowbird parasitism and nest predation, particularly because males often sing from the nest. Perhaps for this reason, seems to have a relatively low MAPS productivity index, although this could also be caused by relative lack of up-mountain movements of young. All things considered, the definitely increasing population trend of 4.0% per year seems surprising. I can offer no ready explanation for this species population increase, but it seems to be increasing throughout the western U.S. (DeSante and George 1994).

HUTTON'S VIREO - *Vireo huttoni*
Stat: R **West**: fR. **East**:
Dist: T **West**: **N**:F-5; **W**:F-5. **East**:
Sign: PAC-9 (but also occurs in the Southwest). **Ssp**. *huttoni* - PAC-7. Sierran population may be relatively small compared to those in the coast ranges.
Hab: **R**: 3-MHW,MHC,MRI.
F: 3-MHW,MHC,MRI,RSP; 2-DFR.

Sp: Shows a strong preference for interior live oaks, but occurs to a lesser extent in canyon and blue oaks. Favors rather dense woodland, often with a shrubby understory.

Abundance: **BBS:** 5 routes; 0.18 birds/route. **MAPS:**

Trends: **BBS:** UN; -2.3% per year

Demographics: **MAPS:**

Potential risks and suggested causes of population trends: Risks include loss of foothill oak habitat to development and, possibly, cowbird parasitism.

WARBLING VIREO - *Vireo gilvus*

Stat: NTM **West:** cS,uT. **East:** cS,rT.

Dist: T **West:** **N**:3-8; **T**:F-10. **East:** **N**:B-8; **T**:B-10.

Sign: CONT-1. **Ssp.** *swainsonii* west slope and both northern and southern portions of east slope - WEST-4 (except absent from Great Basin); *leucopolius* central portion of east slope - RM/GB-8 (but limited to the Great Basin. Populations in the Sierra are large but probably smaller than in other parts of California, particularly the coast ranges.

Hab: **R:** 3-MHW,MHC,ASP,MRI; 2-PPN,[DFR],[MCN],[RFR],[LPN].

F: 3-MHW,MHC,ASP,MRI,RSP; 2-PPN,DFR,MCN,JPN,[RFR],[LPN],EPN,PJN.

Sp: Generally prefers moist conditions and moderate to dense cover. Reaches greatest abundance in the presence of deciduous trees, particularly aspens, cottonwoods, and alders, and to a lesser extent black oaks and maples. However, can also occur in smaller numbers in coniferous forests that completely lack a broad-leaved element.

Abundance: **BBS:** 16 routes; 7.63 birds/route. **MAPS:** 13.33 ad/600 nh

Trends: **BBS:** LS; 0.8% per year

Demographics: **MAPS:** Prod. index: 26.3% yg.
Ann. surv. rate: 0.366 (0.090);
Cap. prob.: 0.530 (0.137).

Potential risks and suggested causes of population trends: Risks include forestry practices that tend to make forests more open and remove or limit deciduous trees. Very susceptible to cowbird parasitism. Also, perhaps because males sing from the nest, may be highly susceptible to nest predation. Shows an even lower MAPS productivity index than Cassin's Vireo. Despite all these risks, BBS data show a likely stable trend. Appears to be increasing throughout the western U.S. (DeSante and George 1994). I can offer no explanation for this stable/increasing trend, except to note the similarities with Cassin's Vireo.

STELLER'S JAY - *Cyanocitta stelleri*

Stat: R **West:** cS,icW. **East:** cS,icW.

Dist: T **West:** **N:**2-10; **W:**F-9. **East:** **N:**B-10; **W:**B-8.

Sign: WMT-6. **Ssp.** *frontalis* - CAL-10. Also occurs in the Cascades of southern and central Oregon. Because of its abundance in the Sierra, the Sierra represents a very important part of this subspecies overall range. However, because it occurs most commonly in the vicinity of human activities, its abundance in the Sierra may be overestimated by casual observation.

Hab: **R:** 3-MHC,PPN,DFR,MCN,JPN,EPN,RSP; 2-MHW,RFR,LPN,ASP,MRI.

F: 3-MHW,MHC,PPN,DFR,MCN,JPN,EPN,MRI,RSP; 2-RFR,LPN,ASP.

Sp: Occurs in a wide-variety of wooded habitats. Reaches its greatest abundance around locations of human habitation and activity in forested areas.

Abundance: **BBS:** 17 routes; 21.62 birds/route. **MAPS:** 0.18 ad/600 nh

Trends: **BBS:** DD; -1.7% per year **

Demographics: **MAPS:** Prod. index: 26.1% yg.

Potential risks and suggested causes of population trends: I have no solid explanation for the decreasing trend in this species, except to note that it

is mirrored by several other very widespread resident species, most notably Mountain Chickadee. However, because Steller's Jays depend heavily on acorns and pine nuts in winter; perhaps a decrease in acorn production or a general decrease in oaks is responsible.

SCRUB JAY - *Aphelocoma coerulescens*

Stat: R **West:** cR,rT. **East:** uR,rT.
Dist: T **West:** N:F-4; **T:**F-10; **W:**F-4. **East: N:**B-8; **T:**B-10; **W:**B-8.
Sign: WUS-5. **Ssp.** *superciliosa* - PCAL-11 (but also breeds north to south-central Oregon). This is the breeding race throughout the west slope and on both the northern and southern portions of the east slope of the Sierra; *nevadae* - RM/GB-8. This is the breeding form on the central eastern slope of the Sierra. Scrub Jays are more common in the lower foothills and valley bottoms west of the Sierra and in the Great Basin country east of the Sierra than in the Sierra proper. Thus the Sierra is somewhat less important overall to these races than are other areas in California. The race *nevadae*, however, is of very limited distribution in California, so even the very small Sierra populations of this race are important to the species in California.
Hab: **R:** 3-RSP; 2-MHW,MHC,PJN,JUN,MRI.
F: 3-RSP; 2-MHW,MHC,PJN,JUN,MRI.
Sp: On the west slope prefers dry, open woodland mixed with chaparral, but also inhabits riparian woodlands and adapts readily to residential areas and gardens. The presence, however, of some oaks seems to be a requisite in natural environments as the species depends heavily on acorns. On the east slope it prefers pinyon and juniper habitat and generally shuns human habitations.
Abundance: BBS: 8 routes; 0.79 birds/route. **MAPS:** 0.01 ad/600 nh
Trends: BBS: UN; -3.2% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: If this spcies is decreasing, it may be due to a deterioration of the acorn crop, as has been Suggested earlier under Band-tailed Pigeon, Acorn and Lewis' Woodpeckers, and Steller's Jay. The species may be declining recently on the east slope too, perhaps due to poor pinyon nut crops caused by the many recent drought years. Otherwise, I cannot readily identify any risks that this species faces.

PINYON JAY - Gymnorhinus cyanocephalus

Stat: **R**-SDM **West:** rS?,irT. **East:** luS,iuT,iuW.
Dist: S **West: N:**7? **T:**4-13. **East: N:**B-8; **T:**6-13; **W:**B-8.
Sign: RM/GB-8. Although this species nests commonly in the pinyon pines east of the eastern base of the Sierran escarpment, they do not seem to nest in the pinyons that clothe the east slope of the Sierra except along the southern part of the east slope. On the west slope, they may also nest on the Kern Plateau. This needs further study, however. At any rate, the Sierra is of less importance to this species than the mountains and flats to the east.
Hab: **R:** 3-PJN,JUN.
F: 3-PJN,JUN; 2-PPN,JPN,EPN.
Sp: Appears to require the presence of pinyon and juniper for nesting but utilizes jeffrey pines as well as pinyons for food during the winter. Almost always encountered in flocks, often of large size. Notably unpredictable as to numbers and location.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Although no BBS data exist for this species, I believe that they may be decreasing on the east slope of the Sierra, perhaps due to the poor pinyon nut crops that, I

believe, have characterized the recent drought years.

CLARK'S NUTCRACKER - *Nucifraga columbiana*
Stat: R-SDM **West:** cS,ifT,ifW. **East:** cS,icT,icW.
Dist: T **West:** N:8-11; T:4-12; W:8-10. **East:** N:7-11; T:B-12; W:7-10.
Sign: WMT-6. Nutcrackers are very common in the Sierra, especially along the east slope, and the Sierra represents an important part of their overall range and an extremely important part of their range in California.
Hab: **R:** 3-(DFR),(JPN),(RFR),LPN,SCN,EPN,PJN; 2-JUN.
F: 3-(DFR),(JPN),(RFR),LPN,SCN,EPN,PJN; 2-JUN.
Sp: Intimately dependent upon subalpine pine crops (whitebark, foxtail, and limber), which they store in a very complex manner, for feeding themselves and their nestlings. Nutcrackers, in fact, are responsible for planting many of the groves of whitebark pines at high elevations (Tomback 1982). In winter utilizes pinyon and jeffrey pines crops as well. Also utilizes centers of human activity at high elevations for foraging. Nest extremely early in the year.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: An increased response by this species to human activities along roads and ski resorts may be driving up their overall numbers in the Sierra. However a decrease in numbers has occurred in the subalpine Hall Natural Area in very recent years(DeSante pers. observ.), perhaps due to decreased whitebark and pinyon pine crops that may be due to recent drought conditions. Otherwise, I can identify no risks that this species might face.

BLACK-BILLED MAGPIE - *Pica pica*
Stat: R **West:** rT. **East:** uR.
Dist: NC **West:** **T:**4-10. **East:** **N:**B-7; **W:**B-7.
Sign: WEST-4. **Ssp.** *hudsonia* - WEST-4. This species is far more common in the Great Basin valleys and flats east of the eastern base of the Sierran escarpment than in the Sierra proper. Thus the Sierra is of less importance to the species than for many other WEST-4 species.
Hab: **R:** 3-JUN,MRI.
F: 3-JUN,WTM,MRI,PAS.
Sp: Nests most commonly near streams, springs, and other sources of water, perhaps because their nest are usually held together to some extent by mud. Commonly nests around ranches. Ranges over many of the Great Basin habitats, but always those that are generally quite open.
Abundance: **BBS:** 2 routes; 0.26 birds/route. **MAPS:**
Trends: **BBS:** UN; -9.8% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Continued persecution by eastside ranchers may be a risk that may be counter-balanced by increased adaptation to human activities. Although BBS data are too limited to identify trends, I believe that the species may have declined recently east of the Sierra.

AMERICAN CROW - *Corvus brachyrhynchos*
Stat: R-SDM **West:** rS?,rT. **East:** rT.
Dist: T **West:** **N:**F-2?; T:F-9. **East:** **T:**B-8.
Sign: CONT-1. **Ssp.** *hesperis* - WEST-4. A species of the Central Valley, American Crows may not nest in the Sierra proper, although there are summer records. Thus, the Sierra is of negligible importance to this species' overall population.

Hab: **R:** 3-RSP.
F: 3-PAS,RSP.
Sp: Prefers valleys, riparian areas, meadows, and agricultural and residential land.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: I can think of no major risk faced by this species except to suggest that the greatly increased raven population may negatively affect it.

COMMON RAVEN - *Corvus corax*
Stat: R **West:** lfR,rT. **East:** fR,rT.
Dist: T **West:** **N:**F-9; **T:**F-12; **W:**F-9. **East:** **N:**B-9; **T:**B-12; **W:**B-9.
Sign: CAN/WMT-3. **Ssp.** *sinuatus* - WEST-4. Because of its rather local Distribution on the West slope, the Sierra is not as important to this species overall range as for other CAN/WMT-3 species.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,(SCN),ASP,EPN,PJN,JUN,MRI,MCP,BAR.
F: 3-MHW,MHC,PPN,DFR,MCN,EPN,WTM,MRI,PAS; 2-JPN,RFR,ASP,MCP,BAR.
Sp: Widespread east of the Sierran crest, but of local occurrence west of the crest where it is usually associated with roads or areas of human habitation and activity.
Abundance: **BBS:** 11 routes; 0.79 birds/route. **MAPS:**
Trends: **BBS:** IT; 6.4% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: The increase of this species is entirely due its association with roads throughout the Sierra where it forages on the ever increasing roadkills associated with the ever-increasing amount of human vehicle traffic. The bird has also responded to the increased human activity in winter around ski resorts and other winter snow-play areas. The actual increase may be less than suggested by roadside BBS data as the birds are still primarily limited to roadsides in the Sierra.

HORNED LARK - *Eremophila alpestris*
Stat: SDM **West:** lfS,rT,icW. **East:** rS,rT,rW.
Dist: T **West:** N:**F**-11; **T:**F-12; **W:**F-5. **East**: N:B-12; **T:**B-12; **W:**B-7.
Sign: CONT-1. Distribution in the Sierra not clear. A population of unknown race bred, at least for several years during the late 70s and early 80s, on the West slope of the crest near Mt. Conesss in the central Sierra (DeSante pers. obs.). These birds were presumably of the race *lamprochroma*. The race *sierrae* breeds in the northern Sierra from the vicinity of Pittville, in Fall River Valley, to the Truckee Valley. Otherwise the species breeds primarily West of the lower foothills (race rubea in the north and actia in the central and south) and East of the East base of the escarpment (race *lamprochroma* in the north and central and race *ammophila* in the south). **Ssp.** *sierrae* - SIE-12; *rubea* - PCAL-11; *actia* - PCAL-11; *ammophila* - PCAL-11; *lamprochroma* - RM/GB-8. Sierran populations of these races, except for *sierrae*, which is endemic to the Sierra, are very small. Thus, the Sierra is of limited importance to them despite the fact that several are classified as PCAL-11. The Sierra is of complete importance, of course, to the race *sierrae*. More information on the status of *sierrae* and subspecific identification of the Mt. Conness population is needed.
Hab: **R:** 2-ADS.
F: 3-WTM,BAR,PAS.
Sp: Requires sparsely-vegetated, short-grass grasslands, heavily-grazed pastures, or dry meadows.
Abundance: **BBS:** **MAPS:**

Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: The alpine Mt. Conness breeding population disappeared after the El Nino winters of 1982 and 1983 and, to my knowledge, never returned. What race were those birds? Why did they breed up there? Have they bred elsewhere in the alpine Sierra? And do they still breed up there? The loss of breeding habitat to extensive agriculture and pesticide contamination are risks that Central Valley/West slope populations face, especially the race *actia*. The *sierrae* race should

be monitored closely as it is a Sierran endemic. In my experience, however, it seems to be abundant and secure, at least in Sierra Valley.

PURPLE MARTIN - *Progne subis*
Stat: NTM **West:** lrS,xT. **East:** xT.
Dist: T **West: N:**F-4?; **T:**F-5. **East: T:**7.
Sign: CONT-1. **Ssp.** *subis* -CONT-1. This species is mostly absent from the Rocky Mts. and western Great Plains so distribution is really a composite of CAN/EUS-3 and PAC-7. Purple Martins are rare, local nesters on the West slope of the Sierra and their Sierran range is of very little importance to the overall species' range. However, Purple Martins are generally uncommon and very local throughout California so all breeding locations, even those few in the Sierra, are of considerable importance to the species' California range.
Hab: **R:** 3-MRI,RSP; 2-[MHW],[MHC],[DFR],[PPN],[MCN].
F: 3-WTM,MRI,PAS,RSP.
Sp: Nests in small colonies in large snags where there are multiple natural cavities or cavities made by the larger woodpeckers such as Acorn and Lewis' Woodpeckers and flickers. Usually forages high in the air.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Although BBS trend data do not exist for this species, it is likely decreasing in the Sierra. This is especially significant as populations appeared to be increasing formerly (Grinnell and Miller 1944). Usurpation of nest sites by European Starlings may be a major factor. Loss of snags, especially large snags with multiple woodpecker holes, is a risk. Possible declines in Lewis' and Acorn Woodpeckers is another potential risk. Use of pesticides is another potential risk. High mortality on South American wintering grounds (due to massive pesticide use) is a likely factor that has been documented for eastern populations at least.

TREE SWALLOW - *Tachycineta bicolor*
Stat: NTM **West:** uS. **East:** uS,xT.
Dist: T **West:** N:F-9. **East: N:**B-8; **T:**B-10.
Sign: CONT-1. Rather uncommon in the Sierra, so Sierran range a little less important to the species than for some other CONT-1 species.
Hab: **R:** 3-MRI,RSP; 2-MHW,MHC,PPN,LPN,EPN.
F: 3-WTM,MRI,PAS,RSP; 2-MHW,MHC,PPN,LPN,EPN,MCP.
Sp: Generally requires the presence of water or moist habitat in its cruising range. Usually forages at low or moderate heights. Cavity nester that responds well to bird boxes.
Abundance: BBS: 12 routes; 1.44 birds/route. **MAPS:**
Trends: BBS: LI; 6.1% per year **
Demographics: MAPS:
Potential risks and suggested causes of population trends: I have no explanation for this species' increase except to note that it continues to adapt well to human presence. Loss of riparian habitat, loss of snags,

usurpation of nests by starlings, and pesticide use are all risks that seem to be outweighed by whatever is causing the increase.

VIOLET-GREEN SWALLOW - *Tachycineta thalassina*
Stat: NTM **West:** cS,rT. **East:** cS.
Dist: T **West: N:**F-9; **T:**F-10. **East: N:**6-10.
Sign: WEST-4. **Ssp.** *lepida* - WEST-4.
Hab: **R:** 3-MHW,MHC,PPN,MCN,MRI,RSP.
F: 3-MHW,MHC,PPN,MCN,WTM,MRI,BAR,PAS,RSP; 2-DFR,JPN,EPN.
Sp: Nests both in tree cavities and in crevices and crannies of cliff faces; thus, common in both rather heavily forested and unforested terrain. Generally does not require the presence of water in its cruising range. Generally forages at greater heights than Tree Swallow. Readily accepts crannies in human-made structures and bird boxes.
Abundance: BBS: 9 routes; 1.30 birds/route. **MAPS:**
Trends: BBS: DT; -9.4% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: It is possible that the decreasing tendency in this species is related to increases in Tree Swallows. However, I think of Violet-greens as being generally much more abundant and widespread in the Sierra than Tree Swallows despite the similarities in BBS abundance indices. Loss of snags and pesticide use are potential risks. Unlike Tree Swallows, Violet-greens usually forage high like swifts, which are also decreasing. Perhaps pesticide use has lessened the number of up-mountain wind-drifted insects.

NORTHERN ROUGH-WINGED SWALLOW - *Stelgidopteryx serripennis*
Stat: NTM **West:** uS,xT. **East:** rS,rT.
Dist: T **West: N:**F-5; **T:**F-9. **East: N:**B-7; **T:**B-10.
Sign: US-2. **Ssp.** *serripennis* - US-2 (except SW). Because this species is uncommon in the Sierra, its importance there is less than for some other US-2 species.
Hab: **R:** 3-MHW,MHC,PPN,(EPN),(PJN),(JUN),MRI,MCP,BAR,RSP.
F: 3-MHW,MHC,PPN,(EPN),(PJN),(JUN),WTM,MRI,PAS,RSP; 2-MCP.
Sp: Nest in natural or rodent-excavated holes in the earthen banks of streams, washes, and gullies. Probably because of its nesting requirements, usually found along streams, but also occurs in the absence of water if suitable nesting banks exist. Generally forages low over the ground or water.
Abundance: BBS: 7 routes; 0.81 birds/route. **MAPS:**
Trends: BBS: UN; -2.6% per year **
Demographics: MAPS:
Potential risks and suggested causes of population trends: Because, this species' nesting habits are similar to those of the kingfisher, which is declining, loss of nesting habitat may be a risk. Pesticide use is another possible risk.

CLIFF SWALLOW - *Hirundo pyrrhonota*
Stat: NTM **West:** lcS,xT. **East:** lfS,rT.
Dist: T **West: N:**F-5; **T:**F-9. **East: N:**B-7; **T:**B-12.
Sign: CONT-1. **Ssp.** *pyrrhonota* - Distribution complex, essentially eastern North America and Pacific states, most closely approximated by US-2. This is the breeding race on the west slope and the northern part of the east slope; *hypopolia* - essentially WEST-4, although absent form the Pacific region and the Southwest. This is the breeding form on the central and southern East slope. Actual breeding locations on the east slope are few; the species becomes much more common east of the eastern base of the Sierran escarpment. Similarly, on the west slope, the species is much more abundant in the lower foothills than higher in the

Sierra proper.
Hab: **R:** 3-(PPN),MRI,RSP.
F: 3-(PPN),WTM,MRI,PAS,RSP.
Sp: Nests in large colonies that plaster their mud nests on natural cliff faces and, more commonly, under the eaves of human-made structures. Presence of mud for nest-building is an important requisite; thus, they usually occur near some source of water. Generally forages rather high in the air.
Abundance: **BBS:** 9 routes; 12.60 birds/route. **MAPS:**
Trends: **BBS:** IT; 1.1% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: The increase in Cliff Swallows in the Sierra is entirely a result of their adaptation to human-made buildings and bridges and to the increase in new concrete bridges that are very much to their liking. In recent times, Cliff Swallows have colonized the Central Valley (where there are no cliffs) primarily by nesting under bridges, especially those crossing irrigation aquaducts. They have followed and are still following such bridges (and other structures) ever higher up the west slope of the Sierra. Gaines (1988) also noted that they exploded in numbers on the east slope and east of the Sierran escarpment between 1982 and 1987. Pesticide use and perhaps a reduction in up-slope wind-drifted insects are the only likely risks.

BARN SWALLOW - *Hirundo rustica*
Stat: NTM **West:** fS,xT. **East:** rS?,rT.
Dist: T **West:** **N:**F-5; **T:**F-9. **East:** **N:**B-7?; **T:**B-7.
Sign: CONT-1. **Ssp.** *erythrogaster* - CONT-1. I know of no actual nesting record on the east slope of the Sierra proper; the species becomes fairly common in the valleys and basins east of the eastern base of the escarpment. Because this species is less common in the Sierra than elsewhere, its Sierran range is of less importance overall than that of some other CONT-1 species.
Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,PJN,WTM,MRI,MCP,[RSP].
F: 3-PPN,WTM,PAS,RSP; 2-MRI.
Sp: Nests almost exclusively under or inside human-made structures. Requires mud for nests and, usually, water or moist habitat over which it forages close to the ground.
Abundance: **BBS:** 9 routes; 1.84 birds/route. **MAPS:**
Trends: **BBS:** PS; -0.5% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This low-foraging species is possibly stable in the Sierra. As it adapts well to human presence and is very much dependent on human structures for nesting, its apparent stability may reflect a balance between increased nesting habitat and decreased prey availability due to pesticide use. This species certainly has increased greatly in the Sierra, both in aggregate numbers and in widespread nature of its distribution, in historical times. Gaines (1988), for example, noted that Barn Swallows were unknown in Yosemite National Park before 1949.

MOUNTAIN CHICKADEE - *Parus gambeli*
Stat: R **West:** cS,icW. **East:** cR.
Dist: T **West:** **N:**3-10; **W:**F-10. **East:** **N:**B-10; **W:**B-10.
Sign: WMT-6. **Ssp.** *abbreviatus* - PAC-7.
Hab: **R:** 3-PPN,MCN,JPN,RFR,LPN,EPN,RSP; 2-MHC,DFR,SCN,ASP,PJN,JUN,MRI.
F: 3-MHC,PPN,MCN,JPN,RFR,LPN,EPN,RSP; 2-DFR,SCN,ASP,PJN,JUN,MRI.
Sp: Found in all conifers except digger pines on the west slope; somewhat less common in pinyon and juniper on the east slope. Cavity nester.
Abundance: **BBS:** 16 routes; 28.64 birds/route. **MAPS:** 3.02 ad/600 nh

Trends: BBS: DD; -1.9% per year **

Demographics: MAPS: Prod. index: 47.7% yg.

Potential risks and suggested causes of population trends: The definitely decreasing trend for this species in the Sierra is hard to explain. Loss of snags could be a potential risk, but the species readily nests in small cracks and crevices in living trees. I would expect this species to be just about the most stable of Sierran landbirds. If this decline is real, it may signify a general deterioration of the Sierran environment. I would expect that it would take extensive clearcutting, general deterioration of the prey base, or major climate change to seriously affect this species, but it may be more responsive to relatively minor environmental changes than I believe. The population and demographic trends of this species should be monitored as a standard for resident species. Despite some annual fluctuations, which seem to be less severe than for more highly migratory species, Mountain Chickadees have remained relatively stable over 22 years in the subalpine Hall Natural Area (DeSante pers.observ.).

CHESTNUT-BACKED CHICKADEE - *Parus rufescens*

Stat: R **West:** luR. **East:**

Dist: NC **West: N**:3-5; **W**:3-5. **East:**

Sign: PAC-7. **Ssp.** *rufescens* - PAC-7. A recent immigrant to the west slope of the Sierra, where it is of local, uncommon occurrence. Thus, the Sierra is of very little importance to this species' total population.

Hab: R: 3-DFR,RSP; 2-MRI.
F: 3-DFR,RSP; 2-MHW,MHC,PPN,MRI.
Sp: Requires rather moist, dense forest, especially of Douglas firs mixed with maples, alders, and madrones, but occurs less commonly in black oaks and mixed coniferous forest. Cavity nester.

Abundance: BBS: 2 routes; 0.15 birds/route. **MAPS:** 0.04 ad/600 nh

Trends: BBS: UN; -12.5% per year

Demographics: MAPS:

Potential risks and suggested causes of population trends: Except for a single specimen collected at 3,000' elevation in the Feather River Canyon in 1939, this species was unknown in the Sierra until 1951 and in the Yosemite region until 1958. It appears, therefore, to have only recently colonized the Sierra from the north. Although this species now shows a very pronounced decrease on the two BBS routes where it occurred, it is hard to know whether or not this represents a regional decline. Other than loss of snags and general loss of habitat to logging operations, it is hard to identify risks. The recent decline in this humid-forest-loving species, if it is real, may be due to the generally dry conditions in the Sierra in recent years.

OAK TITMOUSE - *Baeolophus inornatus*

Stat: R **West:** fS,xT,ifW. **East:** lrP.

Dist: TW,SE **West: N**:F-3; **T**:F-8; **W**:F-4. **East: N**:B-8; **W**:B-8.

Sig: PCAL-11 (although the species extends into extreme southern Oregon). **Ssp.** *inornatus* west slope, except for extreme southern part - PCAL-11. Only at low elevations on the west slope is this species fairly common in the Sierra, so the Sierra is less important to this race than to many other PCAL-11 races; *kernensis* extreme southern end of the Sierra on both the west and east slopes - SIE-12. Although found only at lower elevations in the Sierra, this race is effectively limited to the foothills of the Sierra.

Hab: R: 3-MHW,MHC,RSP; 2-PPN.
F: 3-MHW,MHC,PPN,RSP.
Sp: Prefers oaks, especially blue oaks, and digger pines and favors open woodlands. Like Nuttall's Woodpecker, some birds apparently winter at higher elevations than the breeding range. Cavity nester.

Abundance: **BBS:** 3 routes; 0.17 birds/route. **MAPS:**
Trends: **BBS:** UN; -9.4% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Here is another oak-woodland species that may be decreasing. Although acorns are not a staple of its diet, its dependence on oak woodlands is very high; if oak woodlands in general, and large old oaks with abundant cavities in particular, are declining, the species will be adversely affected. As with virtually all insectivores, pesticides present a risk.

JUNIPER TITMOUSE - *Baeolophus griseus*
Stat: R **West:** **East:** lrS,rW.
Dist: CE **West:** **East:** **N**:B-8; **W**:B-8.
Sign: RM/GB-8. Occurs only as far north as southern Oregon, southern Idaho, and southern Wyoming; thus, almost SW-9. **Ssp.** *zaleptes* locally, central and, possibly, northern portions of east slope, but apparently does not breed in the Sierra proper and is only a rare winter resident in the central and, possibly, northern portion - PCAL-11 (although this race also extends into southern Oregon and western Nevada). Because of this species' marginal occurrence in the Sierra, the Sierra is less important to it than to many other PCAL-11 species.
Hab: **R:** 3- PJN,JUN.
F: 3- PJN,JUN.
Sp: Prefers pinyons and junipers and favors open woodlands. Like Oak Titmouse, this species wanders into atypical habitats during fall and winter when they stray into cottonwood groves, willow and buffalo-berry thickets, and even treeless sagebrush scrub. Cavity nester.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Because of this species' limited occurrence in the Sierra, very little is known about potential risks.

BUSHTIT - *Psaltriparus minimus*
Stat: R **West:** cR,rT. **East:** rS,rT,uW.
Dist: T **West:** **N**:F-4; **T**:F-10; **W**:F-4. **East:** **N**:B-8; **T**:B-10; **W**:B-8.
Sign: WUS-5. **Ssp.** *californicus* west slope and extreme northerly portion of east slope - PCAL-11 (although this race also extends to extreme southern Oregon); *plumbeus* east slope except extreme northerly portion - RM/GB-8. (Grinnell and Miller [1944] limited *plumbea* to the northern portion of the east slope and recognized *providentialis* on the central and southern portions of east slope, but providentialis was not recognized by AOU [1957]. If *providentialis* is recognized, it becomes PCAL-11 and *plumbea* remains RM/GB-8.) Regardless, because the center of abundance for Bushtits lies east and west of the Sierra proper, the Sierra is less important to the overall and California populations of these races than the PCAL-11 and RM/GB-8 classifications suggest.
Hab: **R:** 3-RSP; 2-MHW,MHC,PJN,JUN,MRI,[MCP].
F: 3-RSP; 2-MHW,MHC,PJN,JUN,MRI,[MCP].
Sp: Seems to require large shrubs and small trees for foraging and nesting. On the west slope prefers chaparral, open oak woodland, and riparian, while on the east slope prefers pinyons, junipers, and riparian habitats.
Abundance: **BBS:** 11 routes; 1.20 birds/route. **MAPS:**
Trends: **BBS:** DT; -7.7% per year
Demographics: **MAPS:**

Potential risks and suggested causes of population trends: This species is most abundant in relatively dry foothill situations, is a year-round resident, and is not dependent upon cavities; its decreasing tendency is therefore surprising. Nest predation by Scrub Jays may be a major risk, though Scrub Jays may be declining. Pesticides are the only other risk I can suggest.

RED-BREASTED NUTHATCH - *Sitta canadensis*

Stat: R-SDM **West:** cS,ifT,icW. **East:** ifS,ifT,ifW.
Dist: T **West:** **N**:3-8; **T**:F-10; **W**:F-10. **East:** **N**:7-8; **T**:B-10; **W**:B-10.
Sign: CAN/WMT-3. Populations of this species are typically very high in the Sierra, so that the Sierra may be more important to this species than suggested by CAN/WMT-3.
Hab: **R:** 3-PPN,DFR,MCN,JPN,RFR; 2-LPN,EPN.
F: 3-PPN,DFR,MCN,JPN,RFR; 2-MHC,LPN,EPN,RSP.
Sp: Prefers dense, shady, mature forests at mid-elevations. Cavity nester, but often digs its own nesting cavity in the manner of a woodpecker.
Abundance: **BBS:** 17 routes; 17.78 birds/route. **MAPS:** 0.77 ad/600 nh
Trends: **BBS:** LS; -0.8% per year *
Demographics: **MAPS:** Prod. index: 66.9% yg.
Potential risks and suggested causes of population trends: The overall population trend for this highly irruptive species is likely relatively stable (only a slight decreasing trend was noted on BBS routes). Loss of snags is a risk as are logging operations since the species prefers dense, shady, mature mid-elevation forests. The fact that the species is not very dependent on acorn or pine nut crops is probably the reason that it is not declining the way White-breasted Nuthatches appear to be. Pesticide use on forest insect outbreaks could also be a major risk.

WHITE-BREASTED NUTHATCH - *Sitta carolinensis*

Stat: R **West:** lfR. **East:** fR.
Dist: T **West:** **N**:F-10; **W**:F-10. **East:** **N**:B-10; **W**:B-10.
Sign: CONT-1. **Ssp.** *aculeata* western foothills upslope probably to ponderosa pine zone - PAC-7; *tenuissima* east slope and higher part of west slope downslope probably through lodgepole pine zone - RM/GB-8 (but generally confined to the Great Basin). Racial identity of mid-elevation nuthatches, where they are often absent or rare, is uncertain; more study is needed here. Because the center of abundance for *aculeata* lies in the foothill belt, the Sierra proper may be less important for this race than other PAC-7 species or races.
Hab: **R:** 3-MHW,MHC,PPN,(DFR),(MCN),JPN,LPN,EPN,PJN,JUN,MRI,RSP; 2-(RFR),SCN.
F: 3-MHW,MHC,PPN,(DFR),(MCN),JPN,LPN,EPN,PJN,JUN,MRI,RSP; 2-(RFR),SCN.
Sp: Prefers open forest and woodland, especially partial to oaks (particularly blue and valley oaks) and digger pines in the foothill, to jeffrey and lodgepole pines at higher elevations, and to jeffrey and large pinyons on the east slope. Cavity nester that does not dig its own holes.
Abundance: **BBS:** 14 routes; 2.04 birds/route. **MAPS:** 0.04 ad/600 nh
Trends: **BBS:** PD; -5.3% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: The subspecies of the western foothills, *aculeata*, is highly dependent on acorn crops in winter, while the high-elevation and east slope subspecies, *tenuissima*, is to some extent dependent on pine nut crops in winter. The possible decreasing trend of the species may well be caused by problems with acorn production and/or loss of oak woodland as has been suggested above for Band-tailed Pigeon, Acorn Woodpecker, Scrub Jay, and, perhaps, even Oak Titmouse. Loss of snags, especially large old oaks, may also be a risk for this cavity nester.

PYGMY NUTHATCH - *Sitta pygmaea*
Stat: R **West:** luR,rT. **East:** fR,rT.
Dist: T **West:** **N**:3-7; **T**:3-10; **W**:3-7. **East:** **N**:B-8; **T**:B-10; **W**:B-8.
Sign: WMT-6. **Ssp.** *melanotis* - WMT-6.
Hab: **R:** 3-PPN,MCN,JPN,EPN,RSP; 2-MRI.
F: 3-PPN,MCN,JPN,EPN,RSP; 2-MRI.
Sp: Prefers ponderosa and, to a lesser extent, jeffrey pines on the west slope and jeffry pines on the east slope. Cavity nester that often digs its own nest hole. Communal rooster.
Abundance: **BBS:** 4 routes; 0.32 birds/route. **MAPS:**
Trends: **BBS:** UN; 0.4% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This cavity-nesting "yellow pine" specialist prefers jeffrey pines on both slopes and ponderosa pines on the west slope. Because it avoids oak woodlands and prefers open forest of rather widely spaced trees, it faces fewer risks from logging and habitat loss and degradation than other nuthatches, especially White-breasted. It is, therefore, not surprising that it seems to enjoying a stable tendency. Loss of snags may be a risk, especially, because it is a communal rooster, preferring large snags with multiple cavities.

BROWN CREEPER - *Certhia americana*
Stat: R-SDM **West:** fS,ifW. **East:** fS,iuW.
Dist: T **West:** **N**:3-10; **W**:F-8. **East:** **N**:B-10; **W**:B-8.
Sign: CAN/WMT-3. **Ssp.** *zelotes* - CAL-10. Populations are generally high in the Sierra which may be even more important to this race than CAL-10.
Hab: **R:** 3-MHC,PPN,DFR,MCN,JPN,RFR,EPN,MRI,RSP; 2-[LPN].
F: 3-MHC,PPN,DFR,MCN,JPN,RFR,EPN,MRI,RSP; 2-MHW,[LPN].
Sp: Prefers dense, shady groves of mature forest. Nests behind pieces of loosened bark generally on large living or dead trees.
Abundance: **BBS:** 17 routes; 4.35 birds/route. **MAPS:** 1.75 ad/600 nh
Trends: **BBS:** PD; -3.5% per year
Demographics: **MAPS:** Prod. index: 64.3% yg.
Potential risks and suggested causes of population trends: Because this species prefers dense, shady mature forest, logging operations of most kinds are a risk. Also, because it nests behind loose bark of large dead or living trees, loss of snags could also be a risk. Loss of oaks, however, is not a major risk as it does not generally prefer oak woodland or oak forest. Pesticide use on forest insect outbreaks could be an important risk.

ROCK WREN - *Salpinctes obsoletus*
Stat: SDM **West:** luS,luW. **East:** uS.
Dist: T **West:** **N**:F-12; **W**:F-3. **East:** **N**:B-12.
Sign: WEST-4. **Ssp.** *obsoletus* - WEST-4. Occurs most commonly at lower elevations on both slopes and along the crest of the Sierra at or above treeline. The Sierra represents an important portion of their breeding range in California and overall.
Hab: **R:** 3-MHW,MHC,JUN,MCP,BAR.
F: 3-BAR; 2-MCP.
Sp: Prefers rock outcroppings, rock slide, talus slopes, and fractured cliff faces.
Abundance: **BBS:** 4 routes; 0.19 birds/route. **MAPS:**
Trends: **BBS:** UN; 0.1% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Because of the rugged, rocky habitat that it prefers, this species probably faces relatively slight risks from development pressures in the foothills, and very little or no risk from forestry practices.

CANYON WREN - *Catherpes mexicanus*
Stat: R **West:** fR,xT. **East:** uR,xT.
Dist: T **West:** **N**:F-6; **T**:F-10; **W**:F-6. **East**: N:B-8; **T**:B-10; **T**:B-8.
Sign: WUS-5. **Ssp.** *conspersus* - WUS-5. The Sierra represents a very important portion of their breeding range in California and overall.
Hab: **R:** 3-MRI,BAR.
F: 3-MRI,BAR.
Sp: Prefers steep canyon walls and boulder fields in steep rocky stream canyons. More shade-tolerant and water-loving than Rock Wren.
Abundance: **BBS:** 3 routes; 0.15 birds/route. **MAPS:**
Trends: **BBS:** UN; 1.7% per year
Demographics: **MAPS**:
Potential risks and suggested causes of population trends: Like Rock Wren, this species habitat preferences make it subject to relatively little risk from development and forestry pressures. Climatic trends toward decreasing moisture regimes could be a risk, as could increased disturbance by rock climbers.

BEWICK'S WREN - *Thryomanes bewickii*
Stat: R **West:** fR,rT. **East:** rS,uW.
Dist: T **West:** **N**:F-3; **T**:F-5; **W**:F-3. **East:** **N**:B-7; **W**:B-7.
Sign: US-2. Confined, however, to the southern half of the U.S. and almost extirpated in the East, so species' significance classification is more properly WUS-5. **Ssp.** *drymoecus* northern and central portions of the west slope - PCAL-11; *correctus* southern portion of the west slope and extreme southern portion of east slope - PCAL-11; *atrestus* northern portion of east slope although may not breed in the Sierra proper - PCAL11 (although extends into central southern Oregon and northwestern Nevada); *eremophilus* central and southern east slope (except extreme southern part) - RM/GB-8. The metropolis of the ranges of all of these subspecies does not include the Sierra proper, so the Sierra is of somewhat less importance than these classifications suggest.
Hab: **R:** 3-PJN,JUN,MRI,MCP,RSP.
F: 3-PJN,JUN,MRI,MCP,RSP.
Sp: Prefers shrubland and brushy riparian at lower elevations on both slopes. Not attracted to human habitations as much as House Wren. Crevice or sometimes cavity nester.
Abundance: **BBS:** 11 routes; 0.58 birds/route. **MAPS:**
Trends: **BBS:** DT; -8.6% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Development pressures in the Sierra foothills could be risk as could catastrophic fires caused by years of fire suppression. Loss of foothill riparian habitat is another possible risk. Although a cavity nester, loss of snags may not be much of a problem as it will utilize an amazing variety of nooks and crannies. Fortunately for the species as a whole, western North American populations seem to be able to adapt well to the presence of human activities and encroachment and, in general, are persisting well. Populations of eastern North America, however, are very nearly extirpated.

HOUSE WREN - *Troglodytes aedon*
Stat: SD-NTM **West:** fS,fT. **East:** cS,fT.
Dist: T **West:** **N**:F-5; **T**:F-10. **East:** **N**:B-8; **T**:B-10.
Sign: CONT-1. **Ssp.** *parkmanii* - WEST-4. The Sierra does not constitute the metropolis of this subspecies range in California so it may be of somewhat less importance than WEST-4.
Hab: **R:** 3-MRI,RSP; 2-MHW,MHC,[ASP].
F: 3-WTM,MRI,RSP, 2-MHW,MHC,MCP,[ASP].

Sp: Prefers riparian and other moist hardwood habitats. Crevice or cavity nester that occurs often in association with human habitations.

Abundance: **BBS:** 11 routes; 1.95 birds/route. **MAPS:** 0.39 ad/600 nh

Trends: **BBS:** PS; -0.8% per year

Demographics: **MAPS:** Prod. index: 66.5% yg.

Potential risks and suggested causes of population trends: The stability in this species' population trend may be due to its adaptability to human habitations. Risks include loss of riparian and, to a lesser extent, oak woodland habitat. Loss of snags may also be a risk, but, like Bewick's Wren, although perhaps to a lesser degree, the species can use a variety of cracks and crannies.

WINTER WREN - *Troglodytes troglodytes*

Stat: R-SDM **West:** luS,rT,luW. **East:** rT,rW.

Dist: T **West:** **N**:3-6; **T**:F-8; W:F-5. **East:** **T**:7-10; **W**:6-8.

Sign: CAN/WMT-3. Absent, however, from the Rocky Mountains. **Ssp.** *pacificus* - PAC-7. Generally uncommon or rare in the Sierra which is not an extremely important portion of this species' range even in California.

Hab: **R:** 3-MHC,[DFR],MCN,MRI,RSP; 2-(PPN),(JPN).

F: 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,SCN,ASP,EPN,PJN,JUN,MRI,MCP,RSP.

Sp: Prefers the moist shady interior of dense old-growth forests, especially along streams.

Abundance: **BBS:** 7 routes; 0.36 birds/route. **MAPS:** 0.08 ad/600 nh

Trends: **BBS:** PD; -5.0% per year **

Demographics: **MAPS:** Prod. index: 71.5% yg.

Potential risks and suggested causes of population trends: The most important risk is the loss of dense, shady, old-growth forest upon which this species is dependent. Although found on only seven BBS routes, the significant negative BBS trend of this species, may signal real trouble for this species.

MARSH WREN - *Cistothorus palustris*

Stat: SDM **West:** lrS,rT. **East:** rT.

Dist: T **West:** **N**:5; T:F-9. **East:** **T**:B-10.

Sign: CONT-1. **Ssp.** *plesius* - RM/GB-8. In the Sierra proper, apparently breed only in marshes at Lake Tahoe; however, also breeds fairly commonly in marshes near Mono Lake and probably elsewhere east of the east base of the Sierran escarpment. In any case, the Sierra does not constitute an important portion of the range of the species overall or in California.

Hab: **R:**

F:

Sp: Confined for breeding to fresh water marshes containing a dense growth of tall cattails or tules.

Abundance: **BBS:** **MAPS:**

Trends: **BBS:**

Demographics: **MAPS:**

Potential risks and suggested causes of population trends: Drainage and destruction of marshes are a major risk for this species. Use of pesticides for mosquito abatement could be another risk. There probably exist no Sierran trend data for this species but I suspect that its continued existence at Lake Tahoe could be under considerable risk. The Lake Tahoe population needs to be monitored.

AMERICAN DIPPER - *Cinclus mexicanus*

Stat: R-SDM **West:** fS,uT,fW **East:** fR,uT.

Dist: T **West:** **N**:2-10; **T**:F-12; **W**:F-8. **East:** **N**:B-10; **T**:B-12; **W**:B-10.

Sign: WMT-6. **Ssp.** *unicolor* - WMT-6. The Sierra represents an extremely

important portion of this species range, particularly in California.

Hab: **R:** 3-MRI,BAR,RSP.
F: 3-BAR,RSP; 2-MRI.
Sp: Confined to generally fast-moving streams, rivers, and glacial lakes throughout the Sierra. Nests on rock ledges just above flowing water or behind waterfalls; occasionally nests under bridges.

Abundance: **BBS:** 7 routes; 0.30 birds/route. **MAPS:**

Trends: **BBS:** ST; -0.5% per year

Demographics: **MAPS:**

Potential risks and suggested causes of population trends: In general, this species seems fairly immune to most risks faced by other Sierran species. Thus, the fact that it seems to show a stable tendency is not unexpected. Loss of habitat due to damming of rivers is a threat, and nest failure due to rapid and unpredictable changes in stream flows resulting from releases of water from dams is another risk.

GOLDEN-CROWNED KINGLET - *Regulus satrapa*

Stat: R-SDM **West:** cS,ifW. **East:** uS,iuW.
Dist: T **West:** **N**:4-10; **W**:F-8. **East:** **N**:7-10; **W**:B-8.

Sign: CAN-WMT-3. **Ssp.** *amoenus* - WMT-6. Grinnell and Miller (1944) did not recognize *amoenus* as distinct from *olivaceus* which, as presently defined, is confined to the coastal regions of southeastern Alaska, British Columbia, Washington, and Oregon; they considered Sierran birds to be *olivaceus*. This species is very common in the Sierra which, therefore, may be of more importance to the subspecies *amoenus* than expected from its WMT-6 importance classification.

Hab: **R:** 3-MHC,PPN,DFR,MCN,RFR,LPN,(SCN); 2-JPN,EPN.
F: 3-MHC,PPN,DFR,MCN,RFR,LPN,(SCN); 2-JPN,EPN,MRI,[RSP].
Sp: Prefers mature, well-shaded forests, particularly old-growth red firs, but also dense stands of mature Douglas firs and mixed conifers. Generally forages quite high in the canopy.

Abundance: **BBS:** 17 routes; 7.03 birds/route. **MAPS:** 1.18 ad/600 nh

Trends: **BBS:** LD; -4.0% per year *

Demographics: **MAPS:** Prod. index: 73.6% yg.

Potential risks and suggested causes of population trends: This species is likely decreasing in the Sierra at the relatively substantial rate of –4.0% per year. Risks include logging practices that eliminate old growth and mature forests and that tend to open up dense forests of all ages. Thus, forestry practices may be responsible for the rather substantial likely decrease in this species. It is possible that very hard winters (such as the El Nino winters of 1982 and 1983) could cause massive mortality in this smallest of resident Sierran species and that recovery to "normal" higher population levels could take a long time. I would doubt such a scenario, however, because the species demonstrated both a high MAPS productivity index and a high number of young fledged per territory in the subalpine zone (DeSante 1990).

RUBY-CROWNED KINGLET - *Regulus calendula*

Stat: SDM **West:** uS,fT,fW. **East:** rS,fT,rW.
Dist: T **West:** **N**:7-10; **T**:F-10; **W**:F-4. **East:** **N**:8-10; **T**:B-10; **W**:B-7.

Sign: CAN-WMT-3. **Ssp.** *cineraceus* - WMT-6. This species, in contrast to the Golden-crowned Kinglet, is probably relatively less numerous in the Sierra than in most other mountains in its range; thus, the Sierra may be less important to *cineraceus* than expected from its WMT-6 importance classification.

Hab: **R:** 3-(PPN),(MCN),RFR,LPN,SCN; 2-(DFR),JPN,EPN.
F: 3-MHW,MCN,PPN,MCN,RFR,LPN,SCN,MCP,RSP; 2-DFR,JPN,EPN,PJN,(MRI).
Sp: Strongly prefers lodgepole pine and mountain hemlock forests where it favors rather open forest and the edges of meadows. Like Golden-crowns, Ruby-crowns typically forage high in the canopy during the

breeding season.
Abundance: **BBS:** 8 routes; 0.67 birds/route. **MAPS:** 0.03 ad/600 nh
Trends: **BBS:** DT; -6.1% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Because they prefer more open forest at higher elevations than Golden-crowns, Ruby-crowns may suffer less risk from logging practices than Golden-crowns. My personal feeling in the central Sierra, however, is that Ruby-crowns may have decreased substantially over the past 30 years, and this is substantiated by their -6.1% per year decreasing tendency from BBS data.

BLUE-GRAY GNATCATCHER - *Polioptila caerulea*
Stat: SD-NTM **West:** uS,rT. **East:** uS.
Dist: TW,CSE **West:** **N**:F-5; **T**:F-8. **East:** **N**:B-8.
Sign: US-2. **Ssp.** *amoenissima* - WUS-5. This subspecies is quite uncommon north of central California, central Nevada, southern Utah, and central Colorado, so actual importance classification is closer to SW-9. The subspecies is, however, quite uncommon in the Sierra which, therefore, is of less importance to it than for some other SW-9 subspecies.
Hab: **R:** 2-[MHW],PJN,JUN,[MCP].
F: 2-[MHW],PJN,JUN,[MCP].
Sp: Prefers open woodlands with an open shrubby understory. On the west slope prefers oak woodlands but also less commonly inhabits digger, knobcone and ponderosa pines. On the east slope prefers pinyon pines, junipers, and mahoganies.
Abundance: **BBS:** 2 routes; 0.02 birds/route. **MAPS:**
Trends: **BBS:** UN; -23.5% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species has apparently declined considerably during the past 50 years as Grinnell and Miller (1944) considered it common over virtually all of its California range. The cause of this decline is not clear, although cowbird parasitism has been suggested as a probable cause of decline elsewhere in California. Loss of oak woodland habitat may be another risk.

WESTERN BLUEBIRD - *Sialia mexicana*
Stat: R-SDM **West:** lfS,rT,iuW. **East:** luS,xT.
Dist: TW,NE **West:** **N**:F-5; **T**:F-10; **W**:F-3. **East:** **N**:B-8, **T**:B-8.
Sign: WEST-4. **Ssp.** *occidentalis* - WUS-5 but replaced by *bairdii* over most of the southwestern U.S. Generally, this species is only fairly common in the Sierra; thus, the Sierra may be of less importance to this species than to many other WEST-4 species or WUS-5 subspecies.
Hab: **R:** 3-MHW,MHC,MRI,RSP; 2-PPN,DFR,MCN,JPN,EPN.
F: 3-MHW,MHC,WTM,MRI,PAS,RSP; 2-PPN,DFR,MCN,JPN,EPN,JUN.
Sp: Prefers open stands of oak or mixed oak-coniferous woodland mixed with open grassy meadows or hillsides. Also occurs, at least in the southern Sierra, in open or even semi-closed ponderosa pine or mixed coniferous forest. Also occurs in open riparian habitat with scattered trees. Requires lookout perches on woodland edges or fence posts and telephone wires from which to forage. Cavity nester, requiring woodpecker-excavated holes or natural cavities in dead wood.
Abundance: **BBS:** 8 routes; 0.30 birds/route. **MAPS:** 0.17 ad/600 nh
Trends: **BBS:** IT; 6.5% per year
Demographics: **MAPS:** Prod. index: 33.6% yg.
Potential risks and suggested causes of population trends: Risks include loss of snags, usurpation of nest holes by starlings, and loss of open oak woodlands and riparian areas to residential and other development. May be favored by some kinds of logging operations that open dense lower elevation forests, but tends to avoid areas grown up to dense chaparral or brush;

thus, most logging operations may be detrimental to the species. Still, the species shows an increasing tendency in the Sierra.

MOUNTAIN BLUEBIRD - *Sialia currucoides*
Stat: SDM **West:** uS,rT,rW. **East:** uS,fT,rW.
Dist: T **West:** **N**:8-12; **T**:F-12; **W**:F-4. **East:** **N**:5-12; **T**:B-12; **W**:B-7.
Sign: WMT-6.
Hab: **R:** 3-(PPN),(MCN),LPN,ASP,EPN,MRI; 2-SCN.
F: 3-(PPN),(MCN),LPN,ASP,EPN,WTM,MRI,PAS; 2-SCN,ADS.
Sp: Requires open country with short grass for foraging and dead trees or snags with cavities for nesting. Thus, occurs most commonly at the edges of large meadows, grasslands, and alpine barrens or fell fields. Responds well to human-made structures for nesting in such habitats.
Abundance: **BBS:** 6 routes; 0.24 birds/route. **MAPS:**
Trends: **BBS:** ST; 0.0% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of snags is a risk, but, because this species generally occurs at higher elevations than most logging operations are conducted, may not be affected much by forestry practices.

TOWNSEND'S SOLITAIRE - *Myadestes townsendi*
Stat: SDM **West:** uS,iuW. **East:** uS,fW.
Dist: T **West:** **N**:5-10; **W**:F-9. **East:** **N**:7-10; **W**:B-9.
Sign: WMT-6. **Ssp.** *townsendii* - WMT-6.
Hab: **R:** 3-PPN,MCN,JPN; 2-RFR,[LPN],[EPN].
F: 3-MHW,PPN,MCN,JPN,PJN,JUN; 2-RFR,[LPN],[EPN],MRI,[MCP].
Sp: Prefers rather open forests and woodlands with a well developed shrubby understory, most often on ridges or well-drained slopes, but also less frequently on shady flats or in canyonbottoms. Nests on or near the ground under rocks or logs, at the base of a tree, or on cut banks. In winter on the east slope, virtually always associated with juniper berries, its winter mainstay. On the west slope in winter, utilizes other berries, especially mistletoe, toyon, and elderberries.
Abundance: **BBS:** 15 routes; 1.27 birds/route. **MAPS:**
Trends: **BBS:** PD; -2.9% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Could be affected negatively or positively by logging operations depending on their type and extent. Climate changes that negatively affect berry crops would be major risk. Perhaps the recent tendency toward drought years may be partially responsible for the possible decline. However, at least in the vicinity of Tioga Pass, the species has apparently increased the upper elevational limit of its breeding range in recent years from about 9,000' to above 10,000', presumably in response to drier and more snow-free conditions (DeSante unpub. data).

SWAINSON'S THRUSH - *Cartharus ustulatus*
Stat: NTM **West:** rS,xT. **East:** rS.
Dist: TW,NCE **West:** **N**:F-8; **T**:F-9. **East:** **N**:5-8.
Sign: CAN/WMT-3. **Ssp.** West slope: *ustulatus* - PAC-7 (oedicus according to Marshall [1988] - PAC-7); east slope: *swainsoni* - CAN/WMT- 3 (*almae* according to Grinnell and Miller [1944] and Marshall [1988] - RM/GB-8). AOU (/1957) did not recognize *almae* and merged it with *swainsoni*. Marshall (1988) recoqnized both *almae* and *oedicus*. Regardless of details of taxonomy, it is clear that the west slope and east slope Swainson's Thrushes represent different subspecies. Because the Swainson's Thrush has become so rare in the Sierra, its populations

there are of little importance to the overall species' population or to the particular subspecific populations. However, it is critical to realize that we may now be witnessing the last days of the Swainson's Thrush in the Sierra.

Hab: **R:** 3-MRI.
F: 3-MRI; 2-MHW,MHC,DFR,MCN,RFR,EPN,RSP.
Sp: Requires dense, shrubby, understory vegetation on moist forested slopes near streams or the edges of meadows; or dense riparian vegetation along streams or in meadows but always in or on the edge of a forested situation. The overstory forest is typically mixed hardwood-conifer, Douglas fir, mixed conifer, or red fir.

Abundance: **BBS:** 5 routes; 0.16 birds/route. **MAPS:** 0.43 ad/600 nh

Trends: **BBS:** DT; -5.4% per year

Demographics: **MAPS:** Prod. index: 0.0% yg.

Potential risks and suggested causes of population trends: The Swainson's Thrush has been declining in the Sierra for at least 50 years. They were formerly recorded as being fairly common breeders in the Sierra at many locations, such as Yosemite Valley (Gaines 1988) and Whitaker's Forest (Marshall 1988), where they no longer occur. Marshall (1988) made a strong case that the cause of this remarkable decline (at least on the west slope) was deforestation on its Neotropical wintering grounds in subtropical and tropical primary forest in Mexico and Central America. I generally concur with this assessment, as no obvious extensive habitat changes seem to have occurred to its breeding habitat in the Sierra. The more open meadow/willow habitat of the Willow Flycatcher has been heavily impacted by grazing, but the Swaison's Thrushes that are or were present at some of these same meadows occupy(ied) the dense, shady edges of forest where grazing has much less of an impact. Nevertheless, grazing and associated cowbird parasitism could have played a role in the disappearance of the Swainson's Thrush. The species may now be so rare in the Sierra that birds may have difficulty in finding mates. An apparently unmated male Swainson's Thrush, for example, sang at Hodgdon Meadow in Yosemite National Park and was captured in the MAPS nets there in both 1990 and 1991. No mate or young, however, were ever seen, heard, or captured there.

MAPS data overall, however, suggest that problems on the breeding grounds could also be contributing to the decline of this species. No young have ever been captured in MAPS nets at the three stations at which they occurred, despite the fact that a total of 22 individual adults were captured at these stations. Both males and females were simultaneously present in at least some years at two of the stations, Zumwaldt Meadow in Kings Canyon National Park and the Sierra Nevada Field Campus in the Tahoe National Forest. I can suggest no obvious reason for poor productivity at these stations or in the Sierra in general. Unfortunately, Sierran MAPS data on this rare species is too sparse to produce reliable estimates of adult survival rates for Sierran birds. Adding to the mystery, is the fact that east slope birds also seem to be declining despite the fact that they represent a different subspecies that winters in South America rather than in Mexico and Central America. Obviously, extensive work needs to be conducted on this species if it is to remain a viable component of the Sierran avifauna.

HERMIT THRUSH - *Cartharus guttatus*

Stat: NTM **West:** fS,uT,rW. **East:** fS,uT,rW.
Dist: T **West:** **N**:5-10; **T**:F-10; **W**:F-3. **East:** **N**:7-10; **T**:B-10; **W**:B-7.
Sign: CAN-WMT-3 **Ssp.** *sequoiensis* - PCAL-11. Except for uncommon, local populations on some of the southern California mountains, this subspecies is limited entirely to the Sierra Nevada. Because populations in the Sierra are typically quite high, the Sierra is of extremely great importance to the survival of this subspecies which could very nearly be classified as a Sierran endemic. Although other

races of Hermit Thrushes (*gutttata*, nana, and possibly *slevini*) migrate and winter in the Sierra, *sequoiensis* winters virtually entirely in Mexico and is rightly considered a Neotropical migrant.

Hab: **R:** 3-MHW,MHC,DFR,MCN,RFR,LPN,SCN,EPN,MRI; 2-PPN,JPN.
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,SCN,EPN,MRI; 2-ASP,PJN,JUN,MCP,RSP.
Sp: At mid-elevations on the west slope prefers dense, shady, mostly mature mixed conifer and red fir forests but occurs less commonly in mixed hardwood-conifer and Douglas fir forests. At higher elevations and on the east slope, occurs in more open lodgepole pine, subalpine conifer, and aspen forests.

Abundance: **BBS:** 16 routes; 6.40 birds/route. **MAPS:** 1.71 ad/600 nh

Trends: **BBS:** PI; 2.2% per year

Demographics: **MAPS:** Prod. index: 31.2% yg.

Potential risks and suggested causes of population trends: In sharp contrast to Swainson's Thrush, Hermit Thrush shows a possibly increasing trend of 2.2% per year. The species typically winters in Mexico in more temperate montane habitats than Swainson's Thrush and, thus, currently may be less affected than Swainson's Thrush by deforestation on its wintering grounds. Logging of mid-elevation Sierran forests, especially old-growth and dense mature forests, is a major risk. Selective logging of higher elevation and east slope forests may present a smaller risk as the species regularly occurs there in more open forest.

AMERICAN ROBIN - *Turdus migratorius*

Stat:	SDM	**West:** cS,ifW.	**East:** cS,ifW.
Dist:	T	**West:** **N**:F-10; **W**:F-4.	**East:** **N**:B-10; **W**:B-8.

Sign: CONT-1. **Ssp.** *propinquus* - WEST-4. Robins are common and widespread in the Sierra which represents an important part of their range in California and a reasonably important part of the range of the subspecies *propinquus*.

Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,JPN,LPN,MRI,RSP; 2-RFR,SCN,ASP,EPN.
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,LPN,WTM,MRI,MCP,RSP; 2-FR,SCN,ASP,EPN,PJN, JUN,PAS.
Sp: Requires moist tree-margined meadows, pastures, or lawns at virtually any elevation and in association with virtually any forest type. Requires a source of mud for nest building. Responds very favorably to the lawns and gardens around human habitations. Requires substantial crops of berries for winter sustenance.

Abundance: **BBS:** 17 routes; 32.06 birds/route. **MAPS:** 3.25 ad/600 nh

Trends: **BBS:** DD; -3.1% per year ***

Demographics: **MAPS:** Prod. index: 28.4% yg.

Potential risks and suggested causes of population trends: Here is another of the ten Sierran landbirds that is definitely decreasing in the Sierra. Considering its widespread, nearly ubiquitous distribution and generally high abundance in the Sierra, this is a most surprising result. Perhaps the drought conditions that have often prevailed over the past 20 years has negatively impacted this species, which requires moist habitat for foraging and nest-building. It is also possible that drought conditions (and perhaps even the extreme El Nino conditions that occurred in 1982 and 1983) adversely affected the Sierra's berry crops, this species' major winter food source. This latter possibility is complicated because the robin populations wintering in the Sierra may not be the same populations that breed there. Other than extensive clearcutting, most logging operations may not greatly adversely affect robin populations. Extensive grazing that causes stream channelization will cause a general drying out of meadows which could adversely affect this species. Other risks are hard to suggest.

WRENTIT - *Chaemaea fasciata*

Stat:	R	**West:** cR,rT.	**East:**
Dist:	W	**West:** **N**:F-5; **T**:F-7; **W**:F-5.	**East:**

Sign: CAL-10. Also breeds in western Oregon and northwestern Baja California, so not entirely restricted to California. However, CAL-10 still represents the best importance classification. **Ssp.** *henshawi* - CAL-10 is probably a better classification than PCAL-11.
Hab: **R:** 2-MCP,RSP.
F: 2-MCP,RSP.
Sp: Requires dense brushland. Most common in dense hard chaparral, especially dense chamise, ceanothus, and poison oak.
Abundance: **BBS:** 10 routes; 0.75 birds/route. **MAPS:**
Trends: **BBS:** IT; 2.32% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of foothill chaparral to development is a risk, as is the occurrence catastrophic fires due to years of fire suppression. The species, however, shows an increasing tendency in the Sierra.

SAGE THRASHER - *Oreoscoptes montanus*
Stat: SDM **West:** xT. **East:** rS?.
Dist: T **West:** **T**:4-9. **East:** **N**:B-8?.
Sign: RM/GB-8. This species nests commonly throughout the sagebrush east of the eastern base of the Sierran escarpment, but does not seem to nest in the sagebrush that covers the east slope of the Sierra except, perhaps, along the southeastern flank of the Sierra. In fact, there seems to be no record of this species actually on the east slope of the Sierra in the Yosemite region (Gaines 1988). Thus, like the Pinyon Jay, this species may not nest in the Sierra proper. At any rate, the Sierra is of negligible importance to the species' overall population.
Hab: **R:**
F: 2-JUN.
Sp: Requires sagebrush covered flats or gently rolling hills. Apparently does not occur on steep slopes even if the habitat is otherwise perfect.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: I can suggest no risks to this species on its breeding ground. However, the species may be impacted by loss of grassland habitat on its wintering grounds, although the impact should be less than for species that are more restricted to grassland habitats. No trend data exist for the this species in the Sierra.

CALIFORNIA THRASHER - *Toxostoma redivivum*
Stat: R **West:** lfR. **East:**
Dist: T **West:** **N**:F-3; **W**:F-3. **East:**
Sign: CAL-10. **Ssp.** *sonomae* northern part of west slope - PCAL-11; *redivivum* southern part of west slope -PCAL-11. Despite the fact that this species is not widely distributed in the Sierra, the foothills of the Sierra do constitute a significant portion of the overall range of this species, especially for the northern race *sonomae*. Thus, populations in the Sierra should be monitored closely.
Hab: **R:** 2-MCP,RSP,[MRI].
F: 2-MCP,RSP,[MRI].
Sp: Restricted to dense chaparral and, to a lesser degree, adjacent dense riparian habitats, and edges of dense live oak woodlands. Adapts, to some extent, to the neighborhood of human habitations provided considerable cover is maintained.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**

Potential risks and suggested causes of population trends: Loss of habitat to development in the foothills is an important risk. Decreased production of foothill berry crops due to drought conditions could be another problem.

EUROPEAN STARLING - *Sturnus vulgaris*

Stat: SDM **West:** lcS,uW. **East:** lcS,lfW.
Dist: T **West: N**:F-5; **W**:F-4. **East: N**:B-8; **W**:B-7.
Sign: CONT-1. Starling populations in the Sierra are generally only a fraction of what they are in most other areas of their range, so the Sierra is not of great importance to their overall population.
Hab: **R:** 3-RSP; 2-MHW,MHC,PPN,PJN,JUN,MRI.
F: 3-WTM,PAS,RSP; 2-MHW,MHC,PPN,ASP,PJN,JUN,MRI.
Sp: Closely associated with human habitats such as urban and suburban areas, ranches, agricultural and pastoral areas, garbage dumps, and low-elevation campgrounds. Generally does not utilize areas remote from human habitation except for nesting. Cavity nester that readily evicts most species from nests that it appropriates for its own use.
Abundance: BBS: 7 routes; 2.68 birds/route. **MAPS:**
Trends: BBS: IT; 5.7% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: Populations have shown a steady and dramatic increase since their invasion of California, first reported in 1942. Their invasion of the Sierra began in earnest in the 1960s and is apparently continuing to this day; the species shows an increasing tendency of 5.7% per year on the seven Sierran BBS routes on which it occurred. Increased human use of the Sierra in all ways, especially increased residential development, and increased adaptation of the species to human habitations at ever-increasing altitudes are probably the major factors effecting its increase. I can identify no risks that this species faces. To the contrary, the presence of starlings can be a risk to numerous other cavity nesting species.

AMERICAN PIPIT - *Anthus rubescens*

Stat: SDM **West:** luS,rT,xW. **East:** luS,uT.
Dist: CS **West: N**:10-12; **T**:F-12; **W**:F-5. **East: N**:10-12; **T**:B-12.
Sign: CAN-WMT-3. **Ssp.** *alticola* - RM/GB-8. American Pipits have apparently only recently colonized the alpine regions of the central and southern Sierra as all high country records prior to the 1970s occurred between late August and October, when transients would be expected. Old July records, however, exist for both Mt. Shasta and Mt. Lassen (Grinnell and Miller 1944). The racial identity of the pipits breeding in the Sierra has been ascertained by Miller and Green (1987) as *alticola*, the race breeding in the Great Basin and central Rocky Mountains. Although pipits are relatively uncommon in the alpine Sierra, this major range extension is of great importance to the overall distribution and population of the *alticola* subspecies. Except for several pairs breeding on the summit of Mt. San Gregorio in southern California, the entire breeding range of American Pipit in California lies in the alpine Sierra. It is critical, therefore, that the population of breeding pipits in the Sierra be monitored, at least at relatively infrequent intervals.
Hab: **R:** 3-ADS.
F: 3-WTM,ADS,BAR,PAS.
Sp: Requires moist alpine meadows, most often in the vicinity of lakes or tarns.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Miller and Green

(1987) suggest that American Pipits might have been eliminated from the Sierra during the most recent xerothermic period, 3,000 to 5,000 years ago, and that chance dispersal or prior colonization of the Great Basin ranges has allowed the species to recolonize the Sierra now that cooler and wetter conditions prevail. It is not clear at present whether pipits are increasing or decreasing in the Sierra, but casual observations in the Hall Natural Area suggest smaller numbers during the recent drought years (1987-1994) than during earlier wetter years (1978-1986) (DeSante pers. observ.).

Other than climate factors, I can suggest no risks that this species might be facing in the Sierra.

PHAINOPEPLA - *Phainopepla nitens*

Stat: R-SDM **West:** iuS,xT,irW. **East:** irS,xT.
Dist: TW,SE **West:** **N**:F-2; **T**:F-8; **W**:F-2. **East:** **N**:B-7; **T**:B-8.
Sign: SW-9. **Ssp.** *lepida* -SW-9. Phainopeplas are generally uncommon breeders in the Sierra which, therefore, constitutes a relatively unimportant part of the species overall range. However, the foothills of the Sierra constitute a relatively important part of the species' northern California range, so attempts to monitor the species in the Sierra should be made.
Hab: **R:** 3-RSP; 2-[MHW].
F: 3-RSP; 2-[MHW].
Sp: Requires open woodlands or scattered groves of small trees. Utilizes both oak woodland (live and blue oak) and riparian woodland. A special requirement, especially in the non-breeding season, is the presence of berries, particularly mistletoe berries and, to a lesser extent, elderberries.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: No population trend data exist for the Sierra, but loss of foothill oak habitat and poor productivity of berry crops during drought conditions are potential risks.

ORANGE-CROWNED WARBLER - *Vermivora celata*

Stat: SD-NTM **West:** cS,cT. **East:** uS*,cT.
Dist: T **West:** **N**:F-4; **T**:F-11. **East**: N:6-8?; **T**:B-11.
Sign: CAN/WMT-3 (although occurs outside montane habitat over some of the western states). **Ssp.** *lutescens* west slope - PAC-7; *orestera* may breed locally on central portion of east slope, but positive evidence of breeding is still lacking. While a common breeder at low elevations on the west slope, Sierran breeding populations are probably relatively small compared to coast range populations. Extremely abundant, however, as a summer visitor to higher elevations in the Sierra, often outnumbering all other species. Thus, the Sierra may be of critical importance for molting and pre-migratory maintenance for this species.
Hab: **R:**
F: 3-MHW,MHC,MRI,MCP,RSP; 2-PPN,MCN,JPN,RFR,LPN,[SCN],ASP,EPN.
Sp: Limited to rather open to moderately dense, brushy woodlands at lower elevations for nesting. Shows a preference for interior live oak woodland, but also nests in canyon oak and blue oak woodland, especially if mixed with chaparral or other brush, and even in arborescent chaparral in the absence of woodland. Occurs in all habitats during up-mountain drift, but reaches greatest abundance in montane meadows and montane riparian situations where it is often the commonest species. Locations of suspected possible breeding on the central east slope are in streamside willows and aspens in the lower reaches of the major canyons.
Abundance: **BBS:** 15 routes; 1.91 birds/route. **MAPS:**

Trends: BBS: PD; -1.8% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: Loss of oak woodland and chaparral habitat on the lower west slope is a risk; as is, to a lesser extent, cowbird parasitism. Loss of montane meadow and riparian habitat or degradation of this habitat by grazing is a serious risk. BBS data indicate that Sierran populations may be declining.

NASHVILLE WARBLER - *Vermivora ruficapilla*
Stat: NTM **West:** cS,fT. **East:** rS*,uT.
Dist: T **West: N**:3-6; **T**:F-11. **East: N**:6-9?; **T**:B-11.
Sign: CAN/WMT-3 (but absent from most of the Rocky Mountains and Great Basin where replaced by Virginia's Warbler). **Ssp.** *ridgwayi* - PAC-7. Very common in the Sierra which represents a very important part of this subspecies' range. Like the Orange-crowned Warbler, drifts up-slope in large numbers after the breeding season. May breed locally on the central part of the east slope, but there is no confirmed breeding record, although birds carrying food have been seen in Lee Vining Canyon (Gaines 1988).
Hab: R: 3-MHW,MHC,PPN,MCN,MRI,MCP.
F: 3-MHW,MHC,PPN,MCN,MRI,MCP,RSP; 2-DFR,JPN,RFR,LPN,ASP.
Sp: Prefers black oaks, canyon oaks, and maples mixed with conifers, particularly ponderosa pine and mixed conifers. Prefers relatively dry, rather open forest with a well developed shrubby understory. Upslope dispersal carries birds into virtually all habitats, although largest concentrations occur in montane meadows and montane riparian habitat.
Abundance: BBS: 15 routes; 8.89 birds/route. **MAPS:** 3.61 ad/600 nh
Trends: BBS: PD; -2.9% per year
Demographics: MAPS: Prod. index: 71.3% yg.
Potential risks and suggested causes of population trends: Risks include forestry practices that remove or limit the requisite deciduous-conifer-brush combination that it prefers; loss or degradation of montane meadows and montane riparian habitat due to forestry practices and/or grazing is a major risk. Cowbird parasitism is also a risk. BBS data indicate a possibly decreasing population trend. The high MAPS productivity index may be an artifact of the large numbers of young that disperse up-slope.

VIRGINIA'S WARBLER - *Vermivora virginiae*
Stat: NTM **West:** xT. **East:** lirS,lrT.
Dist: T **West: T**:4-6. **East: N**:6-9; **T**:6-10.
Sign: RM/GB-8. Probably a recent colonist with a very tenuous foothold in the Sierra where it is very rare and irregular. Thus, the Sierra does not comprise an important part of the species range. However, the breeding range in California is limited to the White, Clark, New York, and occasionally, the northeastern San Bernardino Mountains and the species is quite uncommon; thus, the Sierra could become important for the species survival in California.
Hab: R: 3-MCP; 2-[EPN].
F: 3-MCP; 2-[EPN].
Sp: In the Sierra, prefers open woodlands of pinyon pine and mahogany mixed with tracts of shrubs; also occurs in riparian thickets.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS
Potential risks and suggested causes of population trends: Probably a recent colonist to the Sierra that is irregular in numbers from year to year. No trend data are available. Cowbird parasitism is a major risk.

YELLOW WARBLER - *Dendroica petechia*

Stat: NTM **West:** cS,xT. **East:** cS,xT.
Dist: T **West:** **N**:F-6; **T**:F-9. **East:** **N**:B-8; **T**:B-10.
Sign: CONT-1. **Ssp.** *brewsteri* west slope and northern and north-central portions of east slope - PAC-7; *morcomi* south-central and southern portions of east slope - RM/GB-8. AOU (1957) does not recognize *brewsteri* and merges it with morcomi, which would then be WEST-4.
Hab: **R:** 3-(PPN),(MCN),MRI,(MCP).
F: 3-PPN,MCN,MRI,MCP,RSP; 2-MHW.
Sp: Generally requires riparian habitat, particularly willows, cottonwoods, aspens, and alders, or willows in montane meadows. However, has apparently recently begun to adapt to dry, dense montane chaparral with only a few scattered trees and to monocultural tracts of re-seeded pine seedlings about six-feet tall.
Abundance: **BBS:** 16 routes; 5.62 birds/route. **MAPS:** 4.18 ad/600 nh
Trends: **BBS:** PD; -3.3% per year
Demographics: **MAPS:** Prod. index: 39.8% yg.
Ann. surv. rate: 0.804 (0.139);
Cap. prob.: 0.672 (0.120).
Potential risks and suggested causes of population trends: Loss of montane riparian habitat and degradation of montane meadows due to grazing are very serious risks. Cowbird parasitism is also a serious risk as this species is a favorite host species. May be adapting to the kind of vegetative growth that often develops after fires or clearcutting and to the early stages of pine plantations. If this adaptation is real and successful, some forestry practices that are deleterious to most species could be favorable to this species. Given the possibly decreasing trend, however, this is a species that should be monitored very closely.

YELLOW-RUMPED WARBLER - *Dendroica coronata*
Stat: SD-NTM **West:** cS,cT,uW. **East:** cS,cT,rW.
Dist: T **West:** **N**:4-10; **T**:F-10; **W**:F-4. **East:** **N**:6-10; **T**:B-10; **W**:B-7.
Sign: CAN-WMT-3. **Ssp.** *auduboni* throughout the Sierra - PAC-7. Grinnell and Miller (1944) did not recognize memorabilis which AOU (1957) recognizes as breeding in the White and Inyo Mountains east of the Sierra. Grinnell and Miller included *memorabilis* in *auduboni* which would then have an importance classification of WMT-6. Regardless, Yellow-rumped Warblers are very common in the Sierra which constitutes an important part of their range.
Hab: **R:** 3-MHC,PPN,DFR,MCN,JPN,RFR,LPN,EPN; 2-SCN,ASP,PJN,MRI.
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,ASP,EPN,MRI,RSP; 2-SCN,PJN,MCP,PAS.
Sp: Occurs in almost all varieties of conifer forests, in dense, shady situations as well as in dry, open situations, from ponderosa pine and Douglas fir forests up through subalpine conifers and down through eastside pine forests; notably less common in pinyon pines, however. Post-breeding dispersal concentrates many birds, particularly young, in montane meadows and montane riparian habitat.
Abundance: **BBS:** 17 routes; 15.63 birds/route. **MAPS:** 5.83 ad/600 nh
Trends: **BBS:** DS; 0.3% per year
Demographics: **MAPS:** Prod. index: 68.9% yg.
Ann. surv. rate: 0.883 (0.218);
Cap. prob.: 0.280 (0.123).
Potential risks and suggested causes of population trends: Because of its wide tolerance of varying conifer habitats, may be less affected by logging operations than some other warbler species; however, it is still a forest species and, as such, is dependent on the existence of, at least, an open forest. Loss and degradation of montane meadow and montane riparian habitat through grazing and other causes could be an important risk to dispersing young. As with most warblers, cowbird parasitism is a potential risk. BBS data indicate a definitely stable trend.

BLACK-THROATED GRAY WARBLER - *Dendroica nigrescens*

Stat: NTM **West:** cS,rT. **East:** rT.
Dist: T **West: N**:3-7; **T**:F-10. **East: T**:B-10.
Sign: WMT-6. Surprisingly, does not breed on the east slope of the Sierra. While common in suitable habitat in the Sierra, the Sierra plays a less important role for the overall population of this species than for most other montane warblers.
Hab: **R:** 3-MHW,MHC,PPN; 2-(PJN),(JUN).
F: 3-MHW,MHC,PPN; 2-MCN,PJN,JUN,MRI.
Sp: Prefers dry, sunny slopes, and open forest or woodland. Canyon oak is the preferred tree species, but also occurs readily in black oaks and ponderosa pines and uncommonly in Douglas firs and mixed conifers. Generally prefers a brushy understory of montane chaparral. While the species is quite common in pinyon pine and juniper habitat in the Great Basin ranges east of the Sierra, it apparently does not breed anywhere on the east slope of the Sierra.

Post-breeding up-slope dispersal does not carry many birds much beyond the elevations of their breeding grounds and they are generally rare in montane meadows.
Abundance: **BBS:** 12 routes; 3.77 birds/route. **MAPS:** 0.22 ad/600 nh
Trends: **BBS:** PS; 0.1% per year **Demographics:** **MAPS:**
Potential risks and suggested causes of population trends: Its preference for canyon oaks and dry open forest makes this species potentially less adversely affected by most logging practices than many other warblers. Loss and degradation of montane meadows and montane riparian habitat may also be less of a risk than for other warblers. Loss of habitat to development, especially at the lower elevation stronghold of its range, could be a major risk, as is cowbird parasitism, especially where development encroaches on its breeding habitat.

HERMIT WARBLER - *Dendroica occidentalis*

Stat: NTM **West:** cS,uT. **East:** rT.
Dist: T **West: N**:4-8; **T**:F-10. **East: T**:9-10.
Sign: PAC-7. Populations of this species are very high in the Sierra, which represents an extremely important part of the species' overall range.
Hab: **R:** 3-MHC,PPN,DFR,MCN,JPN,RFR; 2-(MHW).
F: 3-MHC,PPN,DFR,MCN,JPN,RFR; 2-MHW,LPN,MRI,RSP.
Sp: Prefers relatively dense, shady, mostly mature conifer-dominated forest at mid-elevations. Preferred tree species are white, red, and Douglas firs, and sugar and ponderosa pines.
Abundance: **BBS:** 17 routes; 10.03 birds/route. **MAPS:** 5.50 ad/600 nh
Trends: **BBS:** LS; -0.7% per year
Demographics: **MAPS:** Prod. index: 55.6% yg.
Potential risks and suggested causes of population trends: Because this species prefers mature, rather dense conifer forest, it is highly susceptible to most logging practices which could present a serious risk to the species. Congregates to some extent in montane meadows and montane riparian habitats during up-mountain dispersal, so degradation of these habitats presents at least a small risk. Like most warblers, cowbird parasitism also presents a risk. Despite these threats, shows a likely stable BBS trend.

MACGILLIVRAY'S WARBLER - *Oporornis tolmiei*

Stat: NTM **West:** fS,fT. **East:** fS,fT.
Dist: T **West**: N:3-8; **T**:F-10. **East: N**:6-8; **T**:B-10.
Sign: WMT-6. **Ssp.** *tolmiei* throughout the Sierra - WTM-6 (but absent from much of the central and southern Rocky Mountains and Great Basin where replaced by *monticola*, which, however, was not recognized by Grinnell and Miller [1994]). Other subspecies have been described and perhaps

occur in the Sierra, but I am not familiar with the literature on them. This species is very common in the Sierra which constitutes an important part of the species' range.

Hab: **R:** 3-(DFR),MRI; 2-[MHC],[MCN],[RFR].
F: 3-(DFR),MRI; 2-[MHC],[MCN],[JPN],[RFR],[LPN],[SCN],[EPN],MCP.
Sp: Prefers moist montane riparian thickets, the margins of montane meadows, and the shrubby understories of moist, generally dense forests. Occurs commonly in up-slope dispersal and, perhaps even more commonly, in migration in montane meadows and montane riparian habitat at higher elevations.

Abundance: **BBS:** 15 routes; 4.46 birds/route. **MAPS:** 12.54 ad/600 nh

Trends: **BBS:** LS; -0.6 per year

Demographics: **MAPS:** Prod. index: 51.0% yg.
Ann. surv. rate: 0.508 (0.078);
Cap. prob.: 0.679 (0.090).

Potential risks and suggested causes of population trends: The loss and degradation of montane riparian habitat and montane meadows due to grazing and other causes is a serious risk. Logging practices that open-up dense moist forest or destroy the shrubby understory of such forests also provide a serious risk. Encroaching development into the lower elevations of its breeding range, and the cowbird parasitism that can be associated with such development are also risks. The likely stable BBS trend for this species is similar to that for Hermit Warbler.

COMMON YELLOWTHROAT - *Geothylpis trichas*

Stat: SD-NTM **West:** rS?,rT. **East:** rS*,rT.
Dist: T **West:** **N**:F-7?; **T**:F-7. **East:** **N**:B-7?; **T**:B-10.

Sign: CONT-1. **Ssp.** *arizela* west slope - PAC-7; *occidentalis* east slope - RM/GB-8. Grinnell and Miller (1944) did not recognize *arizela* and merged it with *occidentalis*. If this taxonomy is followed then the appropriate importance classification of the expanded *occidentalis* would be WUS-5 (although the subspecies is absent from the Southwest).

Although this species breeds in marshes in the Central Valley and east of the eastern base of the Sierran escarpment, there may not be any valid breeding records in the Sierra proper, except, perhaps, for the lowest foothills of the west slope. Nevertheless, territorial males have been present for extended periods in summer on both the east and west slopes of the Sierra, so breeding is possible. Regardless, the Sierra is very unimportant to the species' overall population, both in California and continent-wide.

Hab: **R:** 3-WTM,MRI.
F: 3-WTM,MRI.
Sp: Generally restricted to moist situations with low dense cover; prefers cattails, bulrushes, sedges, and willow thickets, especially in or bordering marshes, ponds, and wet meadows.

Abundance: **BBS:** **MAPS:**

Trends: **BBS:**

Demographics: **MAPS:**

Potential risks and suggested causes of population trends: Loss and degradation of marshes, wet meadows, and dense riparian habitats due to grazing and other causes is a very serious risk. Flooding (or drying-up) of the lower reaches of foothill river valleys due to dam construction and water diversion is also a major risk. This species is also very susceptible to cowbird parasitism, especially in areas where grazing comes in contact with their habitat.

WILSON'S WARBLER - *Wilsonia pusilla*

Stat: NTM **West:** uS,cT. **East:** uS,cT.
Dist: T **West:** **N**:4-10; **T**:F-11. **East:** **N**:8-10; **T**:B-11.

Sign: CAN/WMT-3. **Ssp.** *chryseola* throughout Sierra - PAC-7. The *pilealata* race occurs commonly as a migrant in the Sierra, especially on the east slope, but does not breed in the Sierra. Sierran populations of this species are considerably smaller than populations in the coast ranges; thus the Sierra may be less importance to this species than certain other PAC-7 species.

Hab: **R:** 3-ASP,MRI; 2-[MHC],[DFR],[MCN],[RFR],LPN,[SCN].
F: 3-ASP,MRI,RSP; 2-MHW,MHC,PPN,DFR,MCN,JPN,[RFR],LPN,[SCN],EPN,MCP.
Sp: At mid-elevations, generally restricted to moist montane riparian habitat and moist deciduous trees and thickets on the edges of montane meadows; less commonly in the moist understory of humid, mature coniferous forests. At high elevations and on the east slope occurs most commonly in the willows of montane meadows, on moist, willow-covered subalpine slopes, and in riparian aspen woodlands. Up-slope dispersal and migration concentrates large numbers in the willows of montane meadows.

Abundance: **BBS:** 13 routes; 1.95 birds/route. **MAPS:** 8.82 ad/600 nh

Trends: **BBS:** DT; -6.2% per year

Demographics: **MAPS:** Prod. index: 54.8% yg.
Ann. surv. rate: 0..458 (0.095);
Cap. prob.: 0.665 (0.117).

Potential risks and suggested causes of population trends: Loss and degradation of montane riparian habitats and montane meadows due to grazing and other causes is a serious risk. Forestry practices that eliminate or degrade humid mature and old-growth forest is another serious risk. The species is also very susceptible to cowbird parasitism which is another serious risk. Except for Common Yellowthroat, this species seems more dependent on humid conditions than any other warbler; thus drying climate trends could present another risk. Because the species also shows a negative trend over western U.S. as a whole, its Sierran populations should be very carefully monitored.

YELLOW-BREASTED CHAT - *Icteria virens*

Stat: NTM **West:** rS,xT. **East:** rT?.
Dist: T **West:** **N**:F-2; **T**:F-4. **East:** **T**:B-7.

Sign: US-2. **Ssp.** *auricollis* - WUS-5. Although the species occurs east of the eastern base of the Sierran escarpment as a rare breeder in the Owens Valley and as a rare transient north at least to the Mono Basin, I know of no definite records of breeders or transients on the east slope of the Sierra proper, although I suspect that it does occur rarely as a transient in the lower reaches of the major canyons draining the east slope.

Hab: **R:**
F: 2-MRI.
Sp: Restricted to low, dense riparian growth, primarily willow thickets and tangles of blackberries and tall weeds, in the lower foothills of the west slope.

Abundance: **BBS:** 2 routes; 0.23 birds/route. **MAPS:**

Trends: **BBS:** UN; 3.5% per year

Demographics: **MAPS:**

Potential risks and suggested causes of population trends: This species has decreased drastically along the rivers and streams in the lower foothills of the west slope over the last 50 years, primarily due to dams, water diversions, and logging of riparian forests. Whereas Grinnell and Miller (1944) considered it fairly common, now it is rare at best. Because of the sparseness of the data, the Sierran BBS population trend must be considered unknown. Serious continued risks include further loss and degradation of riparian habitats to residential, commercial, and agricultural development,

water projects, and grazing; and cowbird parasitism.

WESTERN TANAGER - *Piranga ludoviviana*
Stat: NTM **West:** fS,uT. **East:** fS,uT.
Dist: T **West: N**:3-8; **T:**F-10. **East: N**:6-8; **T**:B-10.
Sign: WMT-6. This species is quite common in the Sierra which, therefore, plays an important role in its overall range.
Hab: **R:** 3-(MHW),MHC,PPN,MCN,JPN,RFR,[EPN],MRI; 2-DFR,PJN.
F: 3-MHW,MHC,PPN,MCN,JPN,RFR,[EPN],MRI,RSP; 2-DFR,PJN.
Sp: Favors relatively open forest with a mixture of trees, but seems to occur commonly in both dry and moist conditions. Tends to avoid both extremely dense, closed forests and very open woodland situations. Occurs widely in coniferous forests of most kinds (digger, lodgepole, and pinyon pines are usually avoided for nesting), and in mixed hardwood, aspen, and riparian forests, but, in the latter situations, usually requires the presence of at least a few conifers of some kind.
Abundance: BBS: 17 routes; 20.06 birds/route. **MAPS:** 2.51 ad/600 nh
Trends: BBS: DS; -0.4% per year
Demographics: MAPS: Prod. index: 43.4% yg.
Potential risks and suggested causes of population trends: Risks include extensive logging operations, although, because Western Tanagers tend to prefer relatively open forests, some kinds of logging practices may not be totally detrimental. Loss of montane riparian habitat could be a relatively minor factor as could cowbird parasitism. BBS data, however, indicate that Western Tanager populations are stable in the Sierra.

GREEN-TAILED TOWHEE - *Pipilo chlorurus*
Stat: NTM **West:** uS,rT. **East:** fS,uT.
Dist: T **West: N**:5-8; **T**:F-10. **East: N**:5-9; **T**:B-10.
Sign: RM/GB-8. This species is much less common in the Sierra (especially on the west slope) than in many other parts of its range; thus, the Sierra is less important to its overall populations than for many other RM/GB-8 species.
Hab: **R:** 3-MHW,MHC,(PPN),(MCN),PJN,MCP; 2-(DFR),JUN,MRI.
F: 3-MHW,MHC,PPN,MCN,PJN,MCP; 2-(DFR),JUN,MRI.
Sp: The presence of montane chaparral is a firm requisite for this species. It can be mixed with coniferous forest but only if the forest is sparse and the site is dry and well insolated. On the east slope, where it is much more common, mountain mahogany mixed with sagebrush is preferred. Up-mountain dispersal carries birds into montane riparian and wet meadow habitats.
Abundance: BBS: 12 routes; 3.44 birds/route. **MAPS:** 0.40 ad/600 nh
Trends: BBS: LD; -3.9% per year **
Demographics: MAPS: Prod. index: 27.3% yg.
Potential risks and suggested causes of population trends: Catastrophic fires and extensive logging operations may be a temporary risk, but could also serve to increase the species total population. Loss and degradation of montane riparian and meadow habitat could adversely affect up-mountain dispersers. Cowbird parasitism is a serious risk. The species' Sierran populations are likely decreasing. Perhaps, problems on the wintering range in southern Arizona and northern Mexico may be responsible.

SPOTTED TOWHEE - *Pipilo maculatus*
Stat: R-SDM **West:** cS,rT,cW. **East:** uS,rT,uW.
Dist: T **West: N**:F-6; **T**:F-10; **W:**F-5. **East: N**:B-8; **T**:B-10; **W**:B-7.
Sign: CONT-1. **Ssp.** *falcinellus* west slope and southern portion of east slope - PCAL-11; *curtatus* northern and central portions of east slope - RM/GB-8.
Hab: **R:** 3-MCP,RSP; 2-MHW,MHC,PPN,DFR,MCN,EPN,PJN,JUN,MRI.

F: 3-MCP,RSP; 2-MHW,MHC,PPN,DFR,MCN,EPN,PJN,JUN,MRI.
Sp: Favors large, relatively dense thickets or shrubs with accumulations of leaf litter. On the west slope, prefers arid foothill chaparral, montane chaparral, and shrubby understories of open woodland and forest, particularly oak woodland and ponderosa pine forest; generally occurs in riparian situations only in the lowest foothills. On the east slope, prefers relatively dense and tall brush, often in ravine and canyon bottoms and at the bases of cliffs; often associated with riparian willow thickets and with scattered pinyons, junipers, and mountain mahoganies.

Abundance: BBS: 16 routes; 8.55 birds/route. **MAPS:** 0.29 ad/600 nh
Trends: BBS: PI; 1.7% per year
Demographics: MAPS: Prod. index: 45.5% yg.
Potential risks and suggested causes of population trends: Most forestry practices and even catastrophic fires could be favorable or, at least, not very detrimental, to this species. Lack of strong association with riparian habitat and montane meadows (at least on the west slope) eliminates risks common to many other Sierra species. Cowbird parasitism remains a relatively small risk. Thus, it is not surprising that possible increase of 1.7% per year has been recorded on BBS routes.

CALIFORNIA TOWHEE - *Pipilo crissalis*

Stat: R **West:** fR,xT. **East:**
Dist: T **West:** **N**:F-4; **T**:F-8; **W**:F-4. **East:**
Sign: CAL-10 (although occurs extensively in Baja California as well). **Ssp.** *carolae* west slope except for extreme southern portion - PCAL-11; *kernensis* extreme southern part of west slope and southern end of the Sierra (up-slope from South Fork of Kern River) - PCAL11. California Towhees are much less common in the Sierra than in other parts of California so the Sierra is less important to their overall range than expected from their importance classifications. However, both subspecies, but especially *kernensis*, have very limited ranges so all populations, even the small ones in the Sierra, are of considerable importance.
Hab: **R:** 3-RSP; 2-MCP.
F: 3-RSP; 2-MCP.
Sp: Requires open woodland, broken chaparral, or brushy riparian habitats where shrubland edges on grassland or meadows. Very much attracted to the neighborhood of human habitations.

Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Faces very few risks other than complete urbanization. Aggregate numbers have probably increased somewhat historically and, I suspect, an increasing population trend would still be evident if data were available. In addition, they have probably extended their breeding range higher into the mountains in recent years, following the advance of human settlement.

RUFOUS-CROWNED SPARROW - *Aimophila ruficeps*

Stat: R **West:** luR,xT. **East:**
Dist: T **West:** **N**:F-3; **T**:F-4; **W**:F-3. **East:**
Sign: SW-9. **Ssp.** *ruficeps* - PCAL-11. This species occurs only marginally on the lower foothills of the west slope of the Sierra. Thus the Sierra is unimportant to the overall range of the species. However, it may be of great importance to the subspecies *ruficeps*, which is confined to central California.
Hab: **R:** 2-MCP.
F: 2-MCP.
Sp: Confined year-round to dry, sunny, predominately grassy slopes with

scattered small shrubs and rocky outcrops. Generally avoids dense chaparral and woodlands of all types.

Abundance: BBS: **MAPS:**

Trends: BBS:

Demographics: MAPS:

Potential risks and suggested causes of population trends: This species seems to have expanded its range northward in recent years to include the foothills of the northern west slope of the Sierra (as well as the northern east slope of the inner coast ranges bordering the Sacramento Valley). It is possible, however, that this species was previously overlooked in this part of its range. Population trends for this species in the Sierra are unknown. However, the subspecies deserves careful monitoring as a great deal of its range occurs in the Sierra. Increased residential development of its habitat represents a potentially serious risk, as does increased grazing pressures on its very specialized habitat and associated cowbird parasitism. The southern California race of this species, *canescens*, is a federal Candidate 2 species.

CHIPPING SPARROW - *Spizella passerina*

Stat: SD-NTM **West:** fS,fT. **East:** fS,fT.

Dist: T **West: N**:3-10; **T**:F-10. **East: N**:6-10; **T**:B-10.

Sign: CONT-1. **Ssp.** *arizonae* - PAC-7 (but also extends into central western and southeastern Arizona). This species is (or at least was) quite common in the Sierra which, therefore, represents an important part of the subspecies' range.

Hab: **R:** 3-MHW,MHC,PPN,MCN; 2-DFR,JPN,RFR,LPN,EPN,PJN,JUN,MRI.

F: 3-MHW,MHC,PPN,MCN,WTM; 2-DFR,JPN,RFR,LPN,EPN,PJN,JUN,MRI,MCP.

Sp: Prefers the edges of relatively dry montane meadows and open woodland and forest with little or no shrub cover. Perhaps most common on the west slope between 5,000' and 9,000' where, in contrast to the above WHR, they may prefer the edges and openings in mixed coniferous, jeffrey pine, and lodgepole pine forests. On the east slope, they associate with jeffrey pines, mountain mahoganies, and, perhaps to a lesser extent, pinyon pines and junipers. Up-slope dispersal brings birds into montane riparian and montane meadow habitats but even there they generally choose the drier part of such habitats.

Abundance: BBS: 16 routes; 7.44 birds/route. **MAPS:** 2.49 ad/600 nh

Trends: BBS: DD; -6.3% per year ***

Demographics: MAPS: Prod. index: 24.8% yg.

Potential risks and suggested causes of population trends: This is one of ten species that are definitely declining in the Sierra. The highly significant decline is –6.3% per year. I cannot confidently suggest a likely cause for this decline, but suspect that it is connected with the deterioration of grassland habitat on its southwestern winter range. Logging in the Sierra may present a serious risk if the logging produces an accelerated growth of montane chaparral or brush which the species usually avoids. Loss and degradation of montane riparian habitat and montane meadows due to grazing and other causes would seem to be less of a risk to this species than to other species that are not declining. The species, however, is very susceptible to cowbird parasitism and this may be the most important risk to the species in the Sierra. It may also suffer from high rates of nest predation, perhaps from Steller's Jays. The low MAPS productivity index suggests that these latter causes may offer a partial explanation for the pronounced decline. This species warrants intensive monitoring as it may be able to shed considerable light on the causes of declines in Sierran birds in general. Moreover, the species seems to be declining rapidly over most of the western U.S. (DeSante and George 1994).

BREWER'S SPARROW - *Spizella breweri*

Stat: SDM **West:** rT. **East:** fS,uT.
Dist: T **West:** **T**:4-10. **East:** **N**:B-9; **T**:B-10.
Sign: WEST-4. **Ssp.** *breweri* - RM/GB-8. This species is of marginal distribution in the Sierra; thus, the Sierra does not constitute an important part of this species overall range.
Hab: **R:** 3-[MCP].
F: 3-[MCP]; 2-[WTM],PAS.
Sp: This is a sagebrush species *par excellance* that prefers extensive, unbroken stands of sagebrush and bitterbrush. On east slope ridges it also occurs in stunted mountain mahogany, but otherwise generally avoids arborescent mahoganies. In up-mountain drift, it also occurs in wet meadows and alpine grasslands.
Abundance: **BBS:** 2 routes; 0.20 birds/route. **MAPS:** 0.13 ad/600 nh
Trends: **BBS:** UN; 10.9% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Although the species is declining over most of western U.S. (DeSante and George 1994), the species appears to be increasing in the Sierra at a high rate, although it was only detected on two routes. I can offer no explanation for this phenomenon, if it is not just a local aberration. I suspect that declines are caused by degradation of winter grassland habitat in the Southwest. Increased cowbird parasitism may also be a risk that the species faces on its breeding grounds.

BLACK-CHINNED SPARROW - *Spizella atrogularis*
Stat: NTM **West:** ilrS. **East:** iluS,rT.
Dist: CSW,SE **West:** **N**:1-4. **East:** **N**:B-8; **T**:B-8.
Sign: SW-9. **Ssp.** *cana* central and southern portions of the west slope and extreme southern end of the Sierra above South Fork of the Kern River - PCAL-11; *evura* southern portion of the east slope - SW-8. This species generally is rare in the Sierra which does not constitute a major portion of the overall range; thus the Sierra is of minor importance to the species as a whole. It is, however, much more important to the subspecies *cana* which is endemic to a relatively small portion of California.
Hab: **R:** 3-PJN,[MCP].
F: 3-PJN,[MCP].
Sp: On the west slope of the Sierra, this species is generally associated with arid slopes clothed with moderately dense and diverse chaparral. Often reaches maximum densities on old burned over tracts that are well along toward recovery. Habitat preferences are similar on the east slope, but there they are often associated with rocky outcrops and scattered pinyons or junipers.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Nothing is known regarding Sierran population trends for this rare species, except that it is notably irregular in occurrence and may be subject to substantial population fluctuations that may be dependent upon the burning regime of the chaparral. Years of rigid fire suppression may have substantially decreased populations of this species, and fire suppression followed by catastrophic fires may be serious threat to its existence. Development of west slope foothill chaparral habitat may be another threat, as might cowbird parasitism in foothill areas subjected to nearby grazing. Populations of this species need to be monitored closely in the Sierra.

VESPER SPARROW - *Pooecetes gramineus*
Stat: SDM **West:** rT. **East:** uS,rT.

Dist: T **West: T**:F-10. **East: N**:6-9; **T**:B-10.
Sign: CONT-1. **Ssp.** *confinus* - WEST-4. This species is of very marginal occurrence in the Sierra which is not important to its overall range. The Sierra, however, is of somewhat greater importance to the species' breeding range in California.
Hab: **R:** 2-PJN,JUN,[MCP].
F: 2-PJN,JUN,[MCP],PAS.
Sp: Generally restricted to low, sparse sagebrush scrub interspersed with grassy cover or margined by dry grassy meadows. Generally avoids continuous expanses of sagebrush scrub and moist meadows but will occur occasionally in dry pastureland.
Abundance: BBS: **MAPS:** 0.23 ad/600 nh
Trends: BBS:
Demographics: MAPS: Prod. index: 22.9% yg.
Potential risks and suggested causes of population trends: The species has declined seriously over the past 70 years both on the east slope and east of the Sierran escarpment. Overgrazing of the grasses and forbs, primarily by sheep, was apparently responsible for this decline (Gaines 1988). Continued grazing of its rather unique habitat is still a serious risk for this species. Degradation of its wintering habitat in the southwest, also through grazing, is an additional risk. Cowbird parasitism could be another more minor risk. Careful monitoring of this species is warranted.

LARK SPARROW - *Chondestes grammacus*
Stat: SDM **West:** fS,rT,rW. **East:** rT.
Dist: T **West: N**:F-2; T:F-9; W:F-2. **East: T**:B-10.
Sign: US-2 (although generally absent from the eastern seaboard). **Ssp.** *strigatus* - WEST-4. This species occurs only marginally in the Sierra which is of little importance to its overall populations.
Hab: **R:** 2-MHW,(MHC),(PJN),(JUN),PAS.
F: 2-MHW,MHC,PJN,JUN,PAS.
Sp: Prefers open grassland habitat interspersed with widely scattered trees (telephone lines may sometimes suffice) and open oak savannah on the lower foothills of the west slope. Occurs less frequently in open brushland.
Abundance: BBS: **MAPS:**
Trends: BBS:
Demographics: MAPS:
Potential risks and suggested causes of population trends: Agricultural and residential development of foothill grasslands and oak savannah is a serious risk. Increased grazing of such habitat might also pose a risk; cowbird parasitism associated with such grazing certainly poses a risk. Degradation of winter grassland habitat is also a likely risk.

BLACK-THROATED SPARROW - *Amphispiza bilineata*
Stat: SDM **West:** lrS,rT. **East:** uS?,rT.
Dist: SW,SE **West: N**:8?; T:F-7. **East: N**:B-5?; T:B-10.
Sign: RM/GB-8 or SW-9. **Ssp.** *deserticola* - RM/GB-8 or SW-9. This species is extremely rare in the Sierra; the only verified breeding record is apparently on the Kern Plateau on the southern west slope (Beedy and Granholm 1985). May breed along the southern eastern base of the Sierran escarpment in the Owens Valley. Thus, the Sierra is extremely unimportant as regards the total population of the species. Transient records appear to exist for the length of the Sierra on both slopes.
Hab: **R:** 3-[MCP]; 2-EPN,PJN,JUN.
F: 3-[MCP]; 2-EPN,PJN,JUN.
Sp: Prefers sparsely vegetated, strongly insolated desert terrain.
Abundance: BBS: **MAPS:**
Trends: BBS:

Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Nothing is known of population trends in the Sierra. I can identify no important risks during the breeding season, but degradation of winter desert shrubland and grassland habitat could be a risk.

SAGE SPARROW - *Amphispiza belli*
Stat: R-SDM **West:** luR,rT. **East:** liuS,rT
Dist: CW,TE **West:** **N**:1-3; **T**:1-6; **W**:1-3. **East**: **N**:B-8; **T**:B-10.
Sign: WUS-5 (although absent from Pacific Northwest, so classification very nearly RM/GB-8). **Ssp.** *belli* central portion of west slope - PCAL-11; *nevadensis* northern and central portions of the east slope, but may not nest in the Sierra proper as all nesting records to my knowledge lie east of the eastern base of the Sierran escarpment - RM/GB-8; *canescens* southern portion of east slope and extreme southern end of the Sierra north of the South Fork of the Walker River; apparently nests along the eastern base of the Sierran escarpment bordering the Owens Valley - PCAL-11 (although occurs into western Nevada). East slope races are of very limited distribution in the Sierra proper so of little importance to the species or subspecies despite even the limited range of *canescens.* However, even the limited range of *belli* on the central west slope of the Sierra is of great importance to this subspecies which is a federal Category 2 Candidate species.
Hab: **R:** 3-[MCP]; 2-EPN,PJN,JUN.
F: 3-[MCP]; 2-EPN,PJN,JUN.
Sp: On the west slope, *belli*, the "Bell's Sparrow" is restricted to relatively dense unbroken chaparral and has a marked preference for chamise. On the east slope, the two races of typical "Sage Sparrow" prefer fairly dense to moderately open sagebrush and bitterbrush scrub with a gravel "pavement" or alkali "hardpan" between and underneath the bushes.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: No population trend data exist for this species in the Sierra. Populations on (or east of) the east slope are often notably irregular in numbers from year-to-year. They face relatively few risks, however, other than possible degradation of their winter habitat on southwest deserts and grasslands. Populations of *belli* face serious risks from development of their foothill range and from catastrophic fires caused by years of fire suppression. Both populations may be susceptible to cowbird parasitism if grazing is allowed to penetrate their domain. Populations of *belli* require intensive monitoring as it is a federal Candidate 2 species.

SAVANNAH SPARROW - *Passerculus sandwichensis*
Stat: SDM **West:** lrS,rT. **East:** fS,rT.
Dist: CW,TE **West:** **N:**8-9; **T:**F-10. **East:** **N:**B-7; **T:**B-10.
Sign: CONT-1. **Ssp.** *nevadensis* - WEST-4 (although absent from the Pacific slope and southwest). This species occurs only marginally in the Sierra proper which is, therefore, unimportant to its total range, even within California.
Hab: **R:** 3-WTM; 2-PAS.
F: 3-WTM; 2-PAS.
Sp: Prefers relatively dense, moist or wet, short grassland, meadowland, pastureland, and marshland along the lower reaches of mountain streams or about alkali sinks. Avoid both dense shrub cover and very sparse dry grassland, but often forages in the open on sparsely vegetated muddy shores.
Abundance: **BBS:** **MAPS:** 0.09 ad/600 nh

Trends: **BBS:**
Demographics: **MAPS:** Prod. index: 68.7% yg.
Potential risks and suggested causes of population trends: The species has recently colonized Tuolumne Meadows, the only certain nesting location on the west slope. Population trends are otherwise unknown but, unlike Vesper Sparrow, the species seems to be holding its own along the east slope and east of the Sierran escarpment. Possible risks include habitat degradation due to overgrazing and associated cowbird parasitism.

GRASSHOPPER SPARROW - *Ammodramus savannarum*
Stat: SD-NTM **West:** lirS. **East:**
Dist: T **West: N:**F-5. **East:**
Sign: US-2. **Ssp**. *perpallidus* WUS-5. The species is very rare in the Sierra which does not constitute an important portion of the overall or California range of the species.
Hab: **R:** 2-[PAS].
F: 2-[PAS].
Sp: Restricted to dry grassland, meadows, or pastures where the herbaceous vegetation is dense, diverse, and relatively tall.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: No data exist for population trends of the species in the Sierra. However, the species is notably irregular in occurrence from year to year and probably occurs well up onto the west slope only in drought years. Has seemingly become very scarce in central California during the recent drought years. Population of this species need to be monitored but, because of the irregular nature of

their occurrences, this will be a difficult task. Risks include habitat destruction and degradation due to agricultural and residential development and grazing; possible cowbird parasitism; prolonged drought conditions resulting from climate change; and loss and degradation of grasslands for wintering in the Southwest.

FOX SPARROW - *Passerella iliaca*
Stat: SDM **West:** cS,uT,uW. **East:** cS,rT.
Dist: T **West: N:**5-9; **T:**F-10; **W:**F-3. **East: N:**6-9; **T:**B-10.
Sign: CAN/WMT-3. **Ssp.** *megarhynchus* west slope, except southernmost portion, and northern and central-southern portions of east slope - PCAL-11 (although this race also extends into southwestern Oregon); *monoensis* central east slope from northern Alpine County to the southern rim of the Mono Basin - PCAL-11 (but, except for birds breeding in the higher portions of the Mono Basin and Glass Mountain, could be considered to be SIE-12); *stephensi* southernmost portion of the west slope (apparently Fox Sparrows are absent from the southernmost portion of the east slope; this needs to be verified) - PCAL-11 (but, except for isolated populations in the higher Transverse Ranges of southern California, could be considered SIE-12). Fox Sparrows are very common and characteristic inhabitants of the Sierra which is of extremely great importance to the species' range in California and, of course, to the ranges of these California-endemic races.
Hab: **R:** 3-MHW,MHC,MCN,JPN,EPN,MRI,MCP; 2-PPN,(DFR),RFR,LPN,ASP,PJN,JUN.
F: 3-MHW,MHC,MCN,JPN,EPN,MRI,MCP; 2-PPN,(DFR),RFR,LPN,ASP,PJN,JUN,RSP.
Sp: Requires dense growths of montane chaparral, either as pure stands in shrub-covered hillsides or as dense clumps in the understory of open forest. To a lesser extent, and primarily on the east slope, other dense shrubby growth such as aspen thickets and willow tangles near seeps and streams. Typical forest types inhabited when

occurring in the understory of open forest on the west slope are mixed conifers and jeffrey pines and, to a lesser extent, black oaks, ponderosa pines, and red firs. On the east slope, such tree species are most often mountain mahoganies and jeffrey pines.

Abundance: **BBS:** 16 routes; 16.51 birds/route. **MAPS:** 0.82 ad/600 nh

Trends: **BBS:** LS; 0.9% per year

Demographics: **MAPS:** Prod. index: 17.9% yg.

Potential risks and suggested causes of population trends: Forestry practices that convert closed forest to open forest with a shrubby understory, and clearcutting that coverts large forested areas to brush-covered hillsides undoubtedly favor this species. Loss of winter brushland habitat to development in southern California is an important risk.

SONG SPARROW - *Melospiza melodia*

Stat: SDM **West:** cS,rT,uW. **East:** cS,rT,uW.

Dist: T **West:** **N:**F-7; **T:**F-10; **W:**F-4. **East:** **N:**B-9; **T:**B-10; **W:**B-7.

Sign: CONT-1. **Ssp.** *fisherella* entire east slope and nothernmost part of the west slope - RM/GB-8 (but essentially limited to eastern Oregon and northeastern California); *mailliardi* northern half of west slope except for northernmost portion - PCAL-11; *heermanni* southern half of west slope from Yosemite region south -PCAL-11. The Sierra is becoming an increasingly important part of the ranges of these latter two subspecies which, apparently, were formerly nearly limited to the Central Valley and have recently expanded up the west slope of the Sierra.

Hab: **R:** 3-WTM,MRI; 2-MHW,MHC,PPN,DFR,[MCN],ASP,RSP.

F: 3-WTM,MRI; 2-MHW,MHC,PPN,DFR,[MCN],ASP,RSP.

Sp: Prefers dense shrubby vegetation in wet meadows and along the margins of ponds, streams, and lakes, including, especially at higher elevations and on the east side, willow thickets in montane meadows and montane riparian situations. May prefer more woody, rather than herbaceous, vegetation than Lincoln's Sparrow, but the two species now often nest side-by-side in many west-slope Sierran meadows.

Abundance: **BBS:** 12 routes; 1.99 birds/route. **MAPS:** 4.39 ad/600 nh

Trends: **BBS:** IT; 2.2% per year

Demographics: **MAPS:** Prod. index: 57.2% yg.
Ann. surv. rate: 0.410 (0.092);
Cap. prob.: 0.709 (0.119).

Potential risks and suggested causes of population trends: Song Sparrows have apparently expanded their breeding range dramatically up the west slope of the Sierra over the past 50 years, and probably on the east slope as well. They were first found nesting in Yosemite Valley, where they are now prominent breeders, in 1939 (Gaines 1988). Moreover, they have recently (1992) begun nesting successfully along Slate and Lee Vining Creeks near the Hall Natural Area in the Inyo National Forest; there were only two records of transient birds here during the previous 20 years (DeSante unpub. data). The causes of this range expansion are unclear, but could be related to a general warming and drying climatic trend in the Sierra that may have favored this species over the Lincoln's Sparrow. Song Sparrows now occupy many meadows (such as Yosemite Valley) that were formerly occupied by Lincoln's Sparrows. If Lincoln's Sparrows tend to prefer more herbaceous growth than Song Sparrows, the grazing of mid-elevation meadows may have reduced the relative proportion of herbaceous to woody vegetation in these meadows, thus favoring Song Sparrows over Lincoln's Sparrow. The increase of Song Sparrows on the west slope is also interesting in light of the fact that they have probably declined considerably in the Central Valley as a result of destruction of riparian habitat and channelization of streams. Song Sparrows are very susceptible to cowbird parasitism, which must be

considered a major risk to the species. Other risks include continued grazing of montane meadows and degradation of montane riparian habitats. The current population trend in the Sierra is likely relatively stable. However, the population dynamics of this species need to be monitored closely in the Sierra, especially in conjunction with similar monitoring efforts on the Lincoln's Sparrow.

LINCOLN'S SPARROW - *Melospiza lincolnii*

Stat: SD-NTM **West:** fS,uT,rW. **East:** rS,uT,rW.
Dist: T **West: N:**4-9; **T:**F-10; **W:**F-4. **East: N:**8-10; **T:**B-7.
Sign: CAN/WMT-3. **Ssp.** *alticola* - WMT-6 (but occurs only north to Oregon and Idaho; thus, except for its range in the Cascades and the Sierra, could be better considered RM/GB-8). The Lincoln's Sparrow is fairly common in the Sierra which must be considered to be an extremely important part of the species range in California.
Hab: **R:** 3-WTM,MRI; 2-[MCN],[RFR],[LPN].
F: 3-WTM,MRI; 2-[MCN],[RFR],[LPN].
Sp: Prefers dense,fairly tall herbaceous growth edged or intermixed with willows in wet or boggy meadows, generally in fairly wooded situations. May prefer smaller meadows that are more enclosed by forest than Song Sparrow, and, compared to Song Sparrow, seems to prefer meadows with a higher proportion of herbaceous than woody growth.
Abundance: **BBS:** 5 routes; 0.34 birds/route. **MAPS:** 6.59 ad/600 nh
Trends: **BBS:** UN; 1.9% per year
Demographics: **MAPS:** Prod. index: 47.9% yg.
Ann. surv. rate: 0.486 (0.085);
Cap. prob.: 0.577 (0.103).
Potential risks and suggested causes of population trends: This species seems to be shifting its breeding range upward in elevation on the west slope of the Sierra. It is now absent as a breeder from certain relatively low elevation meadows (such as Yosemite Valley) where it formerly was a prominent nesting species. Moreover, during the past 20 years, the species has expanded its upper elevational limit to 10,000' where it now nests regularly at Tioga Pass (M. Morton unpub. data) and occasionally in the Hall Natural Area (D. DeSante unpub. data). This elevational range change may be related to a general warming and drying trend in the Sierra. It may also be tied to the similar elevational range change in the congeneric Song Sparrow. Drying of meadows and grazing could have made lower elevational meadows more favorable to Song than to Lincoln's Sparrows. Alternatively, the larger and, perhaps, more aggressive Song Sparrows could be directly excluding Lincoln's Sparrows from lower elevation meadows by interference competition. Because of the relatively few BBS routes in the Sierra on which Lincoln's Sparrows were recorded, their Sierran population trend must be considered to be unknown despite the apparent increasing trend of 1.9% per year. Interestingly, Lincoln's Sparrows seem to show a lower mean MAPS productivity index than Song Sparrow (47.9% vs. 57.2% young) but a higher mean adult survival rate than Song Sparrow (0.524 vs. 0.356), although neither of these differences are statistically significant. The lower survival rate for Song Sparrow, a much shorter-distance migrant than Lincoln's Sparrow, was apparently due to low survival during the winter of 1992-93, a year of heavy rains in California and heavy snowfall in the Sierra. Degradation of montane meadows due to grazing, logging, and climate change are major risks to this species in the Sierra. Cowbird parasitism is another major risk.

WHITE-CROWNED SPARROW - *Zonotrichia leucophrys*

Stat: SD-NTM **West:** cS,fT,uW. **East:** cS,cT,rW.
Dist: T **West: N:**7-11; **T:**F-10; **W:**F-4. **East: N:**8-11; **T:**B-10; **W:**B-7.

Sign: CAN-WMT-3. **Ssp.** *oriantha* - WMT-6. White-crowned Sparrows are apparently absent from the northernmost part of the Sierra, presumably because maximum elevations are too low to provide substantial habitat for this species. The Sierra represents a very important part of the breeding range of White-crowned Sparrows in California. White-crowned Sparrows of the race *oriantha* do not winter in the Sierra or, for the most part, even in California -- rather, they winter almost exclusively in northern Mexico and Baja California. Sierran wintering birds are *gambelli* that breed in northern Canada.

Hab: **R:** 3-SCN,WTM,MRI,ADS; 2-(DFR),LPN,ASP.
F: 3-(DFR),SCN,WTM,MRI,ADS,RSP; 2-MHW,MHC,PPN,JPN,LPN,ASP,EPN,PJN,JUN, PAS.
Sp: Requires montane meadows with low, dense willow thickets, generally along upper stream courses and around the edges of lakes. Reaches maximum densities in meadows at or just above treeline, but nests locally in meadows at lower elevations.

Abundance: **BBS:** 4 routes; 0.67 birds/route. **MAPS:** 1.87 ad/600 nh

Trends: **BBS:** DT; -8.8% per year **

Demographics: **MAPS:** Prod. index: 39.9% yg.

Potential risks and suggested causes of population trends: Because most BBS routes do not transect the subalpine habitat most favored by White-crowneds, these results must be interpreted as indicating merely that White-crowneds are declining rapidly in, at least, the lower elevations of their breeding range in the Sierra. In this regard, it appears that White-crowneds may have been disappearing from lower elevations for quite some time. Prior to the 1920s, White-crowned Sparrows bred in Yosemite Valley at 4,000' elevation, but have not bred at that elevation since then. While this species may still nest locally at relatively low elevations on the west slope (such as at 6,600' at Perazzo Meadow in the Tahoe National Forest; DeSante, unpub. MAPS data) most current breeding locations are at or above the 8,000' elevation level. Thus, we have a third Sierran sparrow of wet montane meadows (the others are Song and Lincoln's) whose lower and/or upper elevational range limit seems to be increasing in the Sierra. Additionally, however, White-crowned Sparrows in the subalpine Tioga Pass area have been declining at a substantial rate over the past 20 years (M. Morton, pers. comm.) and possible declines have been noted in the Hall Nature Area as well (DeSante unpub. data). Possible risks and potential causes for the decline in White-crowned Sparrows, and for the increasingly higher elevational range limits for all three montane meadow sparrows, are "natural" successional dynamics of montane meadows (do montane meadows naturally dry up in the absence of climate change?), climate changes with a warming and drying tendency, and grazing pressures on montane meadows. Cowbird parasitism could also be a risk. And, of course, degradation of grasslands and brushlands on the species wintering range in northern Mexico could also be a risk.

DARK-EYED JUNCO - *Junco hyemalis*

Stat: SDM **West:** cS,cT,icW. **East:** cS,cT,icW.

Dist: T **West:** **N:**3-10; **T:**F-10; **W:**F-4. **East:** **N:**7-10; **T:**B-10; **W:**F-8.

Sign: CAN/WMT-3. **Ssp.** *thurberi* - CAL-10 (although extends slightly into southern Oregon). This species is extremely abundant in the Sierra which, thus, constitutes a very important portion of its range in California.

Hab: **R:** 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,SCN,ASP,EPN,PJN,MRI,ADS; 2-MCP.
F: 3-MHW,MHC,PPN,DFR,MCN,JPN,RFR,LPN,SCN,ASP,EPN,PJN,MRI,ADS,RSP; 2-[WTM],MCP.
Sp: While common in virtually all forested habitats, juncos reach their greatest abundance in relatively moist situations in somewhat open forests, at openings in forests, and at meadow and streamside edges.

They also nest in dense, mature or old-growth forests provided that there is sufficient herbaceous growth. Tree species that are least preferred or somewhat shunned in the Sierra are oaks in pure stands not mixed with conifers, digger, knobcone, and pinyon pines, and junipers. Responds well to human activities, becoming very common around campgrounds.

Abundance: **BBS:** 17 routes; 26.50 birds/route. **MAPS:** 12.50 ad/600 nh
Trends: **BBS:** DD; -2.8% per year **
Demographics: **MAPS:** Prod. index: 68.8% yg.
Ann. surv. rate: 0.397 (0.067);
Cap. prob.: 0.502 (0.094).

Potential risks and suggested causes of population trends: It is surprising that this extremely widespread and abundant Sierran species (third in BBS abundance index behind American Robin and Mountain Chickadee) is definitely declining at a substantial rate (interestingly, American Robin and Mountain Chickadee are also definitely declining). Because the species reaches maximum densities in relatively moist habitats, a general drying-out of the Sierran climate could be one potential risk. Forestry practices that result in a net loss of forest would presumably result in a net loss of juncos, all else being equal. Cowbird parasitism could be a minor risk. However, I am hard-pressed to suggest a more specific cause for this apparent decline. The high MAPS productivity index may reflect the large amount of up-mountain dispersal in young juncos, while the relatively low adult survival rate (very similar to Song Sparrow) possibly reflects relatively low survival in hard winters.

BLACK-HEADED GROSBEAK - *Pheucticus melanocephalus*

Stat: NTM **West:** cS,rT,xW. **East:** uS,rT.
Dist: T **West:** **N**:F-6; **T**:F-10; **W**:4. **East:** **N**:B-8; **T**:B-10.
Sign: WEST-4. **Ssp.** maculatus - PAC-7. This species is very common in the Sierra which provides an important part of its overall range.
Hab: **R:** 3-MHW,MHC,MRI,RSP; 2-PPN,MCN,EPN,PJN.
F: 3-MHW,MHC,MRI,RSP; 2-PPN,MCN,EPN,PJN.
Sp: This species generally requires the presence of broad-leaved trees, be they oaks, riparian alders, willows, or cottonwoods, or aspens. They also nest commonly in coniferous forests below the red fir zone, provided that at least a few broad-leaved trees are present. Although they seem to prefer deciduous oaks, they also occur quite commonly in canyon and interior live oaks. They occur commonly in both dry and moist habitats and occur in both open and fairly dense forests. They appear, however, to avoid the interior of dense old-growth forest, perhaps because of an absence of a deciduous element. Adapts fairly well to the presence of human activities and habitations.

Abundance: **BBS:** 17 routes; 10.54 birds/route. **MAPS:** 3.13 ad/600 nh
Trends: **BBS:** PD; -1.4% per year
Demographics: **MAPS:** Prod. index: 22.9% yg.

Potential risks and suggested causes of population trends: I cannot suggest a reason for this possible decline except to mention the risks that it (and many other species that are not declining) faces. Loss of riparian and oak habitat may be one risk. Logging practices that cause general loss and degradation of forest habitat is another risk. High levels of nest predation (because males sing from the nest) may be another risk, especially in the face of forest fragmentation. Cowbird parasitism may be yet another risk. And, of course, habitat loss and degradation on the wintering grounds could be another risk. However, because many Sierran Neotropical migrants seem to have relatively stable or increasing population trends, wintering ground risks, if they are the cause, must be species-specific to Black-headed Grosbeaks or area-specific to where Sierran birds winter. In this respect it is of interest that Black-headed Grosbeaks seem to show an

increasing trend over the western U.S. as a whole (DeSante and George 1994).

BLUE GROSBEAK - *Guiraca caerulea*
Stat: NTM **West:** rS,xT. **East:**
Dist: T **West: N**:F-2; **T**:F-4. **East:**
Sign: US-2. **Ssp.** *salicaria* (spelled *salicarius* by Grinnell and Miller [1944]) - CAL-10. A species of valley bottoms, the Blue Grosbeak nests in the Central Valley and in the Owens Valley north to Independence. Presumably, it formerly or still nests in riparian areas along streams and rivers at very low elevations on the west slope. However, the only positive "Sierran" breeding record of which I am familiar is at 1700' elevation along the Merced River (Gaines 1988). Thus, like the Common Yellowthroat, it may not actually breed in the Sierra proper. Regardless, the Sierra constitutes an extremely unimportant part of the species range.
Hab: **R:** 2-[MRI].
F: 2-[MRI],PAS..
Sp: Requires low thick vegetation, perhaps with scattered trees, adjacent to open weedy fields in riparian situations.
Abundance: **BBS:** **MAPS:**
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Was very likely formerly much more common in riparian situations in the lower foothills of the west slope than it is today. Loss of riparian habitat to logging, dams and water diversions, grazing, and agricultural and residential development probably long ago eliminated most individuals of this species. These risk continue through the present. An additional more recent risk is cowbird parasitism. Because the species is so rare in the Sierra, we have no idea of current population trends; if it is still extant, the trends are probably negative, although the species may now be holding its own in the Central Valley.

LAZULI BUNTING - *Passerina amoena*
Stat: NTM **West:** lfS,uT. **East:** fS,rT.
Dist: T **West: N**:F-6; **T**:F-10. **East: N**:B-8; **T**:B-10.
Sign: WEST-4.
Hab: **R:** 3-MRI; 2-MHW,MHC,WTM,(MCP).
F: 3-MRI; 2-MHW,MHC,WTM,(MCP),(RSP).
Sp: Prefers broken chaparral, brushy open oak woodlands, or brushy riparian habitat. Often occurs in relatively dry habitats on the more moist west slope and in or near riparian habitat on the drier east slope. Occurs on the edges of a wide variety of coniferous habitats but, invariably, oaks, riparian habitat or meadows, or montane chaparral is present. Up-slope dispersal concentrates birds in montane meadows and montane riparian habitats.
Abundance: **BBS:** 10 routes; 1.08 birds/route. **MAPS:** 2.41 ad/600 nh
Trends: **BBS:** PS; -0.6% per year
Demographics: **MAPS:** Prod. index: 25.4% yg.
Potential risks and suggested causes of population trends: Risks include loss of oak woodland and riparian habitat, degradation of meadows due to grazing and other causes, and cowbird parasitism. Problems on the wintering grounds could also constitute a major risk. Most forestry operations may not be

detrimental to this species; some could be favorable. The possibly stable BBS trend may indicate that positive and negative factors are tending to cancel each other out in the Sierra.

RED-WINGED BLACKBIRD - *Agelais phoeniceus*

Stat: SDM **West:** lcS,rW. **East:** lcS,rW.
Dist: T **West: N:**F-9; **W:**F-2. **East: N:**B-8; **W:**B-7;
Sign: CONT-1. **Ssp.** *californicus* foothills along west slope, probably entirely at elevations below 2,000' - PCAL-11; *nevadensis* east slope and locally now nearly throughout the west slope at elevations generally above 3,000' - RM/GB-8 (but essentially nearly limited to the Great Basin). The race *aciculatus* breeds in the South Fork of the Kern River Valley, but apparently does not occur upslope to the north in the Sierra proper. Considering this species' distribution and abundance in California and elsewhere outside the Sierra, the Sierra is very unimportant to the species overall populations.
Hab: R: 3-WTM,PAS.
F: 3-WTM,PAS,RSP.
Sp: The race *nevadensis* is nearly restricted in the Sierra to marshes and wet meadows for breeding. It ranges widely to meadows and to campgrounds and other centers of human activity for foraging. The race *californicus* breeds in a wide variety of grassy or marshy habitats along the western base of the Sierra including agricultural lands and pasturelands as well as foothill grasslands.
Abundance: BBS: 10 routes; 2.02 birds/route. **MAPS:** 0.25 ad/600 nh
Trends: BBS: PS; -0.7% per year
Demographics: MAPS: Prod. index: 8.1% yg.
Potential risks and suggested causes of population trends: The race *nevadensis* has apparently colonized the western slope of the Sierra in relatively recent times. Previously known from but a few stream courses at middle elevations (Grinnell and Miler 1944), the species is now widely distributed throughout the west slope in almost all wet meadow or marsh situations up to 7,000' and exceptionally, as at Tuolumne Meadows, up to nearly 9,000'. Even more recently, the species has occurred as a possible breeder at Tioga Meadows at 10,000' (M. Morton pers. comm.). Like Brewer's Blackbirds, Red-wingeds have probably followed human centers of activity into the Sierra and then expanded from these areas into appropriate habitat removed from human activity. They probably face few risks other than a general drying climatic tendency, if it exists.

WESTERN MEADOWLARK - *Sturnella neglecta*
Stat: SDM **West:** uS,rT,iuW. **East:** uS,uT.
Dist: T **West: N:**F-5; **T:**F-10; **W:**F-4. **East: N:**B-7; **T:**B-10.
Sign: WEST-4. **Ssp.** *confluenta* - PAC-7. Grinnell and Miller (1944) did not recognize *confluenta* and considered the species monotypic.
Hab: R: 3-((DFR)),WTM,PAS; 2-(JUN).
F: 3-((DFR)),WTM,PAS,RSP; 2-(JUN).
Sp: Prefers the drier portions of large meadows, flat or rolling grasslands, and pasturelands. Occurs both where the grass and forbs are in pure growths or intermixed with a scattering of bushes.
Abundance: BBS: 6 routes; 0.49 birds/route. **MAPS:**
Trends: BBS: UN; 1.9% per year
Demographics: MAPS:
Potential risks and suggested causes of population trends: Population trends for this species in the Sierra are uncertain, but opening of forests may in general have benefited them. Although they can tolerate a fair amount of grazing, haying operations can be a risk.

YELLOW-HEADED BLACKBIRD - *Xanthocephalus xanthocephalus*
Stat: SD-NTM **West:** lrS,rT. **East:** lfS.
Dist: NW?,TE **West**: **B:**4-6?; **T:**F-6. **East: N:**B-7.
Sign: WEST-4. The Sierra does not constitute an important part of the range of this species either as a whole or in California. Known breeding locations on the west slope may be limited to the Portola area and Lake

Tahoe, both in the northern portion of the west slope.

Hab: **R:** 3-WTM.
F: 3-WTM; 2-[PAS].
Sp: Requires extensive beds of tall dense cattails or tules over standing water for breeding. Generally forages nearby in wet meadows and pastures.

Abundance: **BBS:** 2 routes; 0.14 birds/route. **MAPS:**
Trends: **BBS:** UN; -7.4% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Population trends in the Sierra are unknown, but the species has declined considerably in the Central Valley and southern California due to the draining of marshes. Risks include loss of marshes and wet meadow habitat both in the Sierra and on its winter range.

BREWER'S BLACKBIRD - *Euphagus cyanocephalus*

Stat: SDM **West:** lcS,lfT,uW. **East:** cS,lfT,uW.
Dist: T **West:** **N:**F-9; **T:**F-10; **W:**F-4. **East:** **N:**B-8; **T:**B-10; **W:**B-7.
Sign: WEST-4. The Sierra does not constitute an important part of the range of this species either as a whole or in California.
Hab: **R:** 3-WTM,RSP; 2-MHW,MHC,PPN,DFR,MCN,MRI.
F: 3-WTM,PAS,RSP; 2-MHW,MHC,PPN,DFR,MCN,LPN,EPN,PJN,JUN,MRI.
Sp: Strongly associated with human activities and habitations. Nesting usually takes place in the vicinity of meadows, ponds, lakes, streams, or areas of human habitation. Forages widely over meadows and meadow edges, riparian habitats, and the margins of lakes and streams.
Abundance: **BBS:** 15 routes; 10.32 birds/route. **MAPS:** 0.34 ad/600 nh
Trends: **BBS:** PD; -1.8% per year
Demographics: **MAPS:** Prod. index: 21.5% yg.
Potential risks and suggested causes of population trends: Despite the apparent decreasing trend, this species has increased greatly in the Sierra in recent years and has increased its elevation range dramatically. In Yosemite Valley, for example, it has increased from six pairs in 1920 to "hundreds" in 1940 (Gaines 1988); the Yosemite Valley population now probably numbers in the thousands. In 1928 they were known to nest as high as 7,300' (Grinnell and Miller 19944); now they nest at least to 8,600' and probably higher. The expansion and population increase of this species in the Sierra is due to the increased human activity there and the increased adaptation of the species to human activities and habitations. I can see no risks that the species faces.

BROWN-HEADED COWBIRD - *Molothrus ater*

Stat: SD-NTM **West:** lfS. **East:** lfS.
Dist: T **West:** **N:**F-10. **East:** **N:**B-10.
Sign: CONT-1. **Ssp.** *obscurus* west slope and southern east slope - SW-9; *artimisiae* northern and central portions of east slope - RM/GB-8 (but also extends east to Minnesota and Iowa). The Sierra does not constitute a major portion of the species range, either in California or as a whole. However, because of the species potential serious impact upon the populations of smaller open-cup-nesting landbirds, the species' population trends must be carefully monitored in the Sierra.
Hab: **R:** 3-MRI,RSP; 2-MHW,MHC,PPN,DFR,MCN,JPN,EPN,PJN,JUN,WTM.
F: 3-WTM,MRI,PAS,RSP; 2-MHW,MHC,PPN,DFR,MCN,JPN,EPN,PJN,JUN.
Sp: Generally prefers montane meadows, montane riparian habitat, and especially, the presence of grazing animals in pasturelands and around stables for foraging. Also forages extensively at areas of high human use such as campgrounds, picnic areas and lawns around human habitations. Utilizes the surrounding woodlands and forests up to several miles away from foraging areas in search of host

species' nests. Obligate brood parasite that lays its eggs in the nests of smaller (usually) species that raise its young, usually at the expense of their own young.

Abundance: **BBS:** 15 routes; 2.89 birds/route. **MAPS:** 0.24 ad/600 nh
Trends: **BBS:** DD; -4.9% per year ***
Demographics: **MAPS:** Prod. index: 15.1% yg.
Potential risks and suggested causes of population trends: The spread of cowbirds into California has been well documented. Before 1900 they were virtually unknown in California and by 1915 only one record existed in the Pacific drainage. With the coming of feedlots and irrigated agriculture, they increased phenomenally in southern California and in the Central Valley, where flocks of over 10,000 have been tallied in the recent past. They were first detected on the west slope of the Sierra in Yosemite Valley in 1934, and by the 1960s they had become numerous throughout most of the west slope up to 10,000' elevation. Similar increases undoubtedly occurred on the east slope as well. They were very rare or uncommon there in the 1930s, but flocks of over 100 were recorded in the recent past. Logging, grazing, urbanization, and packhorses and stables undoubtedly contributed to their increase in the Sierra. In my experience, it seems that cowbirds have been declining in the Sierra in recent years; BBS data support this notion with a definite decrease of –4.9% per year over the past 30 years. This decrease may be the result of active efforts to control their numbers or, possibly, to a decrease in the use of horses and the number of stables in the backcountry. Another possibility is that the decrease may represent the "normal" overshoot and return to more equilibrium levels that often accompanies the rapid range expansion and population increase of a pioneering species. Unfortunately, the species faces few identifiable risks in the Sierra.

NORTHERN ORIOLE - *Icterus galbula*

Stat: NTM **West:** cS,rT. **East:** fS,xT.
Dist: T **West:** **N:**F-4; **T:**F-7. **East:** **N:**F-8; **T:**F-10.
Sign: CONT-1. **Ssp.** *bullockii* - WEST-4. This species is of limited occurrence in the Sierra which is not a very important part of its range.
Hab: **R:** 3-RSP; 2-MHW,MHC,PPN,MRI.
F: 3-MHW,MHC,MRI,RSP; 2-PPN.
Sp: On the west slope prefers oak woodlands, especially of large, well-spaced, deciduous oaks, and riparian habitats, especially of cottonwoods and sycamores. Also occurs sparingly in ponderosa pine forest if intermixed with oaks. On the east slope occurs almost exclusively in riparian habitats and in cottonwoods and other deciduous trees planted around ranches and in towns.
Abundance: **BBS:** 7 routes; 0.36 birds/route. **MAPS:** 0.15 ad/600 nh
Trends: **BBS:** UN; -2.2% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Loss of riparian habitat is a major risk that may be counterbalanced by its tendency to utilize deciduous shade trees and windbreaks around human habitations. May be susceptible to cowbird parasitism.

GRAY-CROWNED ROSY FINCH - *Leucosticte tephrocotis*

Stat: R-SDM **West:** fS,irW. **East:** fS,ifW.
Dist: CSW,CSE **West:** **N:**9-13; **W:**10+. **East:** **N:**9-13; **W:**B-10+.
Sign: WMT-6 (but absent in the Rokcy Mountains south of Montana). **Ssp.** *dawsoni* - SIE-12 (but also breeds sparingly in the White Mountains). Absent in the northern Sierra because of absence of high-country breeding habitat.
Hab: **R:** 3-WTM,ADS,BAR.
F: 3-WTM,ADS,BAR.

Sp: Confined for breeding to alpine cirques surrounded by cliffs and steep talus slopes where they place their nests. Forages in alpine and, less frequently, subalpine meadows, on alpine tundra, along alpine lakeshores, and, importantly, on snowbanks and glaciers where it feeds on upslope, wind-dispersed insects. In winter descends down the east slope where it may occur on rocky or barren ground in sagebrush scrub and even in open pinyon juniper woodland.

Abundance: BBS: **MAPS:**

Trends: BBS:

Demographics: MAPS:

Potential risks and suggested causes of population trends: Population trends in the Sierra are unknown. Drought conditions causing the lack or early melting of snowbanks and decreases in the numbers of upslope wind-borne insects, perhaps due to pesticide use at lower elevations, are possible risks.

PINE GROSBEAK - *Pinicola enucleator*

Stat: R **West:** ifS,ifW. **East:** iuR.

Dist: T **West: N:**7-10; **W:**6-10. **East: N:**8-10; **W:**8-10.

Sign: CAN/WMT-3. **Ssp.** *californica* - SIE-12. The Pine Grosbeak as a species in California, and the race *californica* itself, is endemic to the Sierra and has never, to my knowledge, been recorded away from the Sierra, even in winter. The nearest population of this species to this isolated race occurs in northern Oregon. Thus, like the Great Gray Owl and, to a large extent, Black-backed Woodpecker, American Pipit, and Gray-crowned Rosy Finch, the entire California breeding population is isolated in and endemic to the Sierra.

Hab: **R:** 3-RFR,LPN,(SCN).

F: 3-RFR,LPN,(SCN),(WTM),(MRI).

Sp: Usually remains above 7,000' on the west slope, even in winter, but sometimes descends to 6,000' and, occasionally in very hard winters, descends as low as 4,000'. Apparently absent from the northernmost and southernmost portions of the Sierra.

Abundance: BBS: **MAPS:** 0.25 ad/600 nh

Trends: BBS:

Demographics: MAPS: Prod. index: 0.0% yg.

Potential risks and suggested causes of population trends: The overall population trend for this species in the Sierra is essentially unknown. I know of no risk that it currently faces.

PURPLE FINCH - *Carpodacus purpureus*

Stat: SDM **West:** cS,ifW. **East:** xT.

Dist: T **West: N:**3-8; **W:**F-5. **East: T:**B-10.

Sign: CAN/WMT-3 (but absent from the Rocky Mountains and Great Basin). **Ssp.** *californicus* - PAC-7.

Hab: **R:** 3-MHW,MHC,DFR,MCN,RSP; 2-PPN,JPN,((EPN)).

F: 3-MHW,MHC,DFR,MCN,RSP; 2-PPN,JPN,((EPN)).

Sp: Prefers relatively dense and moist forests, forest edges, and meadows in forested situations. Preferred forest types are mixed oak-conifer, Douglas fir, and mixed conifer forests. Ponderosa pine forest is utilized to a lesser extent, especially if dense and moist, while red fir forest is utilized to an even lesser extent.

Abundance: BBS: 15 routes; 4.76 birds/route. **MAPS:** 12.62 ad/600 nh

Trends: BBS: DT; -1.8% per year

Demographics: MAPS: Prod. index: 38.8% yg.

Potential risks and suggested causes of population trends: Sierran populations of this species show a decreasing tendency. Forestry practices that open-up the forest, reduce the diversity of tree species, or reduce the complexity of the forest structure are likely risks to this species. Thus, most logging operations are probably detrimental to Purple

Finches. Climatic changes that tend toward more xeric conditions are also probably an important risk..

CASSIN'S FINCH - *Carpodacus cassinii*

Stat: SDM **West:** cS,iuW. **East:** cS,ifW.
Dist: T **West: N:**6-10; **W:**3-5?. **East: N:**6-10; **W:**B-8.
Sign: WMT-6. Cassin's Finches are very common in the Sierra which constitutes an extremely important part of their range, both overall and in California.
Hab: **R:** 3-(MCN),RFR,LPN,SCN; 2-JPN,EPN.
F: 3-(MCN),RFR,LPN,SCN; 2-JPN,ASP,EPN,WTM,MRI.
Sp: Compared to Purple Finch, this species prefers more open forest and more xeric conditions. Cassin's Finches in the Sierra show a strong preference for open red fir forest and, especially, relatively open lodgepole pine forest, often on the edges of montane meadows. Although Cassin's Finches occur in summer well down into the range of Purple Finches, actual documentation of nesting at these lower elevations is scarce. The winter whereabouts of the majority of the Sierran Cassin's Finch population remains unclear; many individuals may migrate to forests east of the Sierran escarpment.
Abundance: **BBS:** 14 routes; 4.89 birds/route. **MAPS:** 1.52 ad/600 nh
Trends: **BBS:** LD; -3.1% per year *
Demographics: **MAPS:** Prod. index: 41.1% yg.
Potential risks and suggested causes of population trends: This species shows a likely declining BBS population trend in the Sierra. Populations in the Hall Natural Area seem to have shown a substantial decline over the past 22 years (DeSante unpub. data). Productivity in the subalpine seems to be extremely low, primarily due to heavy nest predation by Clark's Nutcrackers. MAPS productivity indices from lower elevation stations, however, do not seem to be inordinately low. Important risks for this species are difficult to suggest. Most forestry practices may not be overly detrimental to this species, other than reducing the net amount of forested habitat. Climate changes promoting more xeric conditions may be favorable to this species, at least as compared to Purple Finch. Indeed, Cassin's Finches tend to breed in the subalpine in substantially larger numbers in years following light snowpacks than in years following heavy snowpacks (DeSante 1990).

HOUSE FINCH - *Carpodacus mexicanus*

Stat: SDM **West:** fS,rT,fW. **East:** lfS,lfT.
Dist: T **West: N:**F-2; **T:**F-10; **W:**F-2. **East: N:**B-6; **T:**B-10.
Sign: WUS-5 (if introduced eastern populations are included, the importance classification is US-2). **Ssp.** *frontalis* - WUS-2 (or US-2 if introduced eastern populations are included). The Sierra is of negligible importance to populations of this essentially lowland species.
Hab: **R:** 3-RSP; 2-((DFR)),((MCN)),PJN,JUN.
F: 3-PAS,RSP; 2-MHW,MHC,(DFR),(MCN),(JPN),EPN,PJN,JUN,WTM.
Sp: This is the most desert-loving of the three *Carpodacus* finches and, by far, the rarest in the Sierra. Strongly prefers the vicinity of human habitations and generally avoids forested areas, occurring only relatively sparingly in oak and pinyon-juniper woodlands. Must have a source of water within its daily cruising range.
Abundance: **BBS:** 5 routes; 0.61 birds/route. **MAPS:**
Trends: **BBS:** UN; -7.3% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Here is another relatively xerophyllic foothill fringillid that, like the Lesser Goldfinch, May be showing a relatively high decreasing BBS trend. I can suggest no important risks that this species might face in the Sierra.

RED CROSSBILL - *Loxia curvirostra*

Stat: R-SDM **West:** ifR,ifW. **East:** ifS,ifW.
Dist: T **West: N:**8-10; **W:**F-10. **East: N:**8-10; **W:**B-10.
Sign: CAN/WMT-3. **Ssp.** *grinnelli* - CAL-10 (but also occurs eastward to southwestern Utah and central-eastern Arizona; thus could almost be classified as SW-9). Although only fairly common in the Sierra, the Sierra represents a very important part of the range of this race, and an extremely important part of the range of the species in California.
Hab: **R:** 3-(DFR),LPN; 2-PPN,MCN,RFR.
F: 3-PPN,DFR,MCN,RFR,LPN.
Sp: Found most predictably in lodgepole pine forests, where the bulk of breeding is assumed to occur. I know of no verified breeding records below 8,000', but I suspect that they do breed at lower elevations on occasion. Because much of their breeding can occur during the winter months, the breeding ecology of this species is very poorly known in the Sierra. For foraging, also utilizes pinyon, ponderosa, and jeffrey pines, but usually to a lesser extent than lodgepoles. When a massive and synchronous failure occurs in the pine seed crops of all of these tree species, crossbills may occur virtually anywhere in search of food or may desert the Sierra entirely.
Abundance: BBS: 7 routes; 0.70 birds/route. **MAPS:**
Trends: BBS: PI; 5.9% per year *
Demographics: MAPS:
Potential risks and suggested causes of population trends: This species is extremely irregular and erratic in occurrence from year to year and place to place, being dependent on irregular and unpredictable pine seed crops. Thus, assessment of its long-term population trend is difficult; its apparent BBS increasing tendency should be viewed with caution. Logging operations that reduce the net amount of forest are a risk, as are weather and climate conditions that negatively affect the pine seed crop, especially of lodgepole pines.

PINE SISKIN - *Carduelis pinus*
Stat: SDM **West:** icS,uT,ifW. **East:** ifS,uT,rW.
Dist: T **West: N:**3-10; **T:**F-10; **W:**F-9. **East: N:**7-10; **T:**B-10; **W:**B-9.
Sign: CAN/WMT-3. **Ssp.** pinus - CAN/WMT-3.
Hab: **R:** 3-DFR,LPN,(SCN); 2-MCN,RFR.
F: 3-DFR,LPN,(SCN),RSP; 2-MHC,PPN,MCN,JPN,RFR,EPN,PJN,WTM,MRI,PAS.
Sp: Occurs and apparently breeds in most types of forest provided that conifers are present. Maximum numbers seem to occur about the edges of forests, especially forest-meadow edges. Much foraging, however, occurs in arborescent riparian hardwoods, especially alders, and in the weedy edges of meadows and forest openings, as well as in coniferous trees.
Abundance: BBS: 11 routes; 1.38 birds/route. **MAPS:** 3.72 ad/600 nh
Trends: BBS: DT; -3.2% per year
Demographics: MAPS: Prod. index: 53.1% yg.
Potential risks and suggested causes of population trends: This species, like most fringillids, is notably erratic and unpredictable in numbers from year to year and place to place. Thus, the BBS trend should be viewed with caution. Significant risks are hard to suggest. Logging operations may not be especially deleterious except to reduce the total amount of forested area. May be subject to widespread epidemics of disease.

LESSER GOLDFINCH - *Carduelis psaltria*
Stat: SDM **West:** fS,iuT,iuW. **East:** uS,iuT
Dist: T **West: N:**F-5; **T:**F-10; **W:**F-3. **East: N:**B-7; **T:**B-10.
Sign: WUS-5. **Ssp.** *hesperophilus* - WUS-5 (but absent in the Southwest east of central Arizona). The Sierra is quite unimportant to this species' populations, both overall and in California.

Hab: **R:** 3-RSP; 2-MHW,MHC,PPN,(DFR),(JPN),EPN,PJN,MRI.
F: 3-RSP; 2-MHW,MHC,PPN,DFR,JPN,EPN,PJN,WTM,MRI,MCP,PAS.
Sp: Prefers openly wooded habitats, particularly live and blue oak woodlands in the lower foothills and, to a lesser extent, foothill chaparral with scattered trees and foothill riparian woodland. When the species breeds or wanders up-mountain from the foothills, it usually occurs in open mixed oak-conifer forest or ponderosa pine forest, or, more commonly, on the edges of montane meadows, particularly dry meadows. Occurs in, or actually prefers, relatively xeric situations, but must have a source of water within its daily cruising range. Responds fairly well to human habitations.
Abundance: **BBS:** 9 routes; 1.27 birds/route. **MAPS:** 0.54 ad/600 nh
Trends: **BBS:** DD; -6.8% per year ***
Demographics: **MAPS:** Prod. index: 39.7% yg.
Potential risks and suggested causes of population trends: The Lesser Goldfinch is one of the ten species that are definitely declining in the Sierra. I am at a loss to suggest what might be happening with this species. Other than development of its habitat (but it responds fairly well to residential development) and cowbird parasitism, I can suggest no major risk to which they might be susceptible. Obviously, increased monitoring of these apparently declining species, in conjunction with a wide range of other foothill species, is urgently needed.

LAWRENCE'S GOLDFINCH - *Carduelis lawrencei*
Stat: SDM **West:** iuS,rT. **East:**
Dist: T **West:** **N:**F-5; **T:**F-7. **East:**
Sign: CAL-10. Because this is essentially a California endemic breeding species with a sizeable portion of its range in the foothills of the Sierra, the Sierra is of great importance to the species' overall population. Has occurred east of the eastern base of the Sierran escarpment but, to the best of my knowledge, has never occurred on the east slope of the Sierra proper.
Hab: **R:** 2-MHW,MHC,((PJN)),MRI.
F: 2-MHW,MHC,((PJN)),WTM,MRI,PAS,RSP.
Sp: Prefers xeric, open oak woodland bordering chaparral in the upper foothills. Seems to reach maximum densities in a mixture of sparse blue oaks, dry chaparral, and scattered digger or ponderosa pines. Needs a daily water source, so conditions may be optimal when such habitat is adjacent to a small stream or seep. When it occurs at higher elevations, prefers habitat similar to, but perhaps drier than, that utilized by Lesser Goldfinch. Seems to respond less well than Lesser Goldfinch to human habitations.
Abundance: **BBS:** **MAPS:** 0.08 ad/600 nh
Trends: **BBS:**
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: Development of its habitat and cowbird parasitism are likely risks that the species is facing. Sierran populations of this species, along with other critical foothill xpecies such as Rufous-crowned, Black-chinned, and Sage sparrows, need to be closely monitored.

AMERICAN GOLDFINCH - *Carduelis tristis*
Stat: SDM **West:** rS,irT. **East:**
Dist: T **West:** **N:**F-1?; **T:**F-5. **East:**
Sign: CONT-1. **Ssp.** *salicamans* - CAL-10. This species occurs as a breeder only in the lower foothills of the west slope, especially, apparently, in the northern portion of the west slope where it may be much more common than further south. I am surprised that it has occurred on eight BBS routes as there seems to be no breeding records for the

Yosemite Sierra (Gaines 1988). Thus, the Sierra is quite unimportant to its overall range or to its range in California, despite the fact that *salicamans* is virtually an endemic California race. The species occurs as a fairly common fall transient and irregular rare winter resident just east of the east base of the Sierran escarpment, but I know of no records on the east slope of the Sierra proper.

Hab: **R:** 3-RSP.
F: 3-RSP; 2-PAS.
Sp: On the west slope of the Sierra, strongly prefers riparian habitat, particularly willows and cottonwoods.

Abundance: **BBS:** 2 routes; 0.02 birds/route. **MAPS:**
Trends: **BBS:** UN; -1.9% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species has been subject to considerable habitat loss and degradation of their foothill riparian habitat. Moreover, the American Goldfinch is probably quite susceptible to cowbird parasitism.

EVENING GROSBEAK - *Coccothraustes vespertinus*

Stat: R-SDM **West:** ifS,irT,ifW. **East:** irS,irT,iuW.
Dist: T **West:** **N:**4-7; **T:**F-10; **W:**F-6. **East:** **N:**7-8; **T:**B-10; **W:**B-8.
Sign: CAN/WMT-3. **Ssp.** brooksi - WMT-6. This species is fairly common in the Sierra which is very important to its overall California population. Altitudinal limits of nesting poorly known; may nest as low as 3,000' on the west slope.
Hab: **R:** 3-MCN,RFR.
F: 3-MCN,RFR; 2-MHW,MHC,DFR,ASP,MRI,RSP.
Sp: Prefers dense, mature forests, primarily of true firs. Utilizes seeds of maples in spring and buds of many species of deciduous trees for food throughout the year. Thus, while often associated with deciduous trees, may not require them for nesting. The ecology of this species in the Sierra is in need of much study.
Abundance: **BBS:** 11 routes; 1.44 birds/route. **MAPS:** 0.47 ad/600 nh
Trends: **BBS:** DT; -4.6% per year
Demographics: **MAPS:** Prod. index: 9.7% yg.
Potential risks and suggested causes of population trends: Because this species prefers dense, mature forests at mid-elevations, logging may be a serious risk. Otherwise, I am at a loss to explain its decreasing tendency.

HOUSE SPARROW - *Passer domesticus*

Stat: R **West:** lfR. **East:** lfR.
Dist: T **West:** **N:**F-4; **W:**F-4. **East:** **N:**B-7; **W:**B-7.
Sign: CONT-1. **Ssp.** *domesticus* - CONT-1. Being essentially confined to the immediate vicinity of urban, suburban, and agricultural human habitations, the Sierra is extremely unimportant to this introduced species' overall and California populations.
Hab: **R:** 3-RSP.
F: 3-PAS,RSP.
Sp: Requires the presence of cities, towns, farms, and ranches for nesting. Wanders more widely for foraging, but usually only within human-modified environments, particularly agricultural lands or pasturelands.
Abundance: **BBS:** 5 routes; 0.33 birds/route. **MAPS:**
Trends: **BBS:** UN; -21.0% per year
Demographics: **MAPS:**
Potential risks and suggested causes of population trends: This species has increased greatly in numbers and range since it invaded California 120 years ago. It is likely still increasing in the Sierra as urbanization and

development continues apace. The large negative trend may be an artifact of small sample size. I can suggest no obvious risks that the species faces in the Sierra.

Appendix 2. Additional Sierra Species Not Included in Appendix 1.

This list includes species of waterbirds, diurnal raptors, and gallinaceous birds that occur (or formerly occurred) in the Sierra (as defined in this report) as breeding species, or that occur as wintering or transient species with an abundance classification greater than "very rare." Waterbirds that occur regularly only at certain large lakes (e.g., Lake Tahoe) are not included.

Common Loon (*Gavia immer*) -- rare transient and non-breeding summer resident.
Eared Grebe (*Podiceps nigricollis*) -- rare transient, mostly in fall..
American White Pelican (*Pelicanus erythrorhynchos*) -- rare transient, mostly in spring.
Great Blue Heron (*Ardea herodius*) -- uncommon year-round non-breeding visitor.
Canada Goose (*Branta canadensis*) -- rare migrant, mostly in spring.
Wood Duck (*Aix sponsa*) -- rare resident (has bred).
Green-winged Teal (*Anas crecca*) -- rare transient and winter resident.
Mallard (*Anas platyrhynchos*) -- uncommon summer resident, rare winter resident; breeds.
Cinnamon Teal (*Anas cyanoptera*) -- rare transient, mostly in spring.
Ring-necked Duck (*Athya collaris*) -- formerly rare winter resident.
Harlequin Duck (*Histrionicus histrionicus*) -- formerly uncommon breeding summer resident; current status uncertain.
Barrow's Goldeneye (*Bucephala islandica*) -- formerly rare breeding summer resident; extirpated.
Hooded Merganser (*Mergus cucullatus*) -- formerly rare winter resident.
Common Merganser (*Mergus merganser*) -- rare year-round resident; breeds.
Turkey Vulture (*Cathartes aura*) -- fairly common summer resident breeding only at low elevations.
California Condor (*Gymnogyps californianus*) -- formerly rare breeding resident in southern Sierra; extirpated.
Osprey (*Pandion haliaetus*) -- rare transient and summer resident; breeds.
Bald eagle (*Haliaeetus leucocephalus*) -- locally uncommon winter resident; rare summer resident and possible breeder.
Northern harrier (*Circus cyaneus*) -- rare non-breeding summer visitor and uncommon transient, mostly in fall.
Sharp-shinned Hawk (*Accipiter striatus*) -- rare summer and winter resident and breeder; uncommon fall transient.
Cooper's Hawk (*Accipiter cooperi*) -- rare summer and winter resident and breeder; uncommon fall transient.
Northern Goshawk (*Accipiter gentilis*) -- rare year-round resident and breeder.
Red-shouldered Hawk (*Buteo lineatus*) -- rare year-round resident and breeder.
Red-tailed Hawk (*Buteo jamaicensis*) -- fairly common year-round resident and breeder.
Golden Eagle (*Aquila chrysaetos*) -- uncommon year-round resident and breeder.
American Kestrel (*Falco sparverius*) -- uncommon year-round resident and breeder.
Merlin (*Falco columbarius*) -- rare transient and winter resident.
Peregrine Falcon (*Falco peregrinus*) -- rare year-round resident and breeder.
Prairie Falcon (*Falco mexicanus*) -- uncommon non-breeding summer visitor.
Chuckar (*Alectoris chukar*) -- introduced; uncommon permanent resident and breeder on east

slope.
Blue Grouse (*Dendragapus obscurus*) -- uncommon permanent resident and breeder.
White-tailed Ptarmigan (*Lagopus leucurus*) -- introduced; uncommon permanent resident and breeder.
Sage Grouse (*Centrocercus urophasianus*) -- rare summer visitor on east slope; non-breeder.
California Quail (*Callipepla californica*) -- fairly common permanent resident and breeder.
Mountain Quail (*Oreortyx pictus*) -- fairly common year-round resident and breeder.
Virginia Rail (*Rallus limicola*) -- rare summer resident and breeder.
American Coot (*Fulica americana*) -- rare transient and winter resident.
Killdeer (*Charadrius vociferus*) -- rare year-round resident and breeder.
Spotted Sandpiper (*Actitis macularia*) -- uncommon summer resident and breeder.
Common Snipe (*Gallinago gallinago*) -- rare summer resident and breeder.
California Gull (*Larus californicus*) -- fairly common non-breeding summer visitor.
Caspian Tern (*Sterna caspia*) -- rare non-breeding summer visitor.