

**An Inventory and Baseline Monitoring of the Bird Fauna of the Carson  
Range, with Emphasis on the  
Lake Tahoe Basin Nevada State and Adjacent Lands**



**Final Report**

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prepared by

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## **INTRODUCTION and OVERVIEW**

Our recent research on Nevada State Park lands in the Carson Range on the east side of the Lake Tahoe basin brought us into frequent contact with a growing visitor population hungry for information about the conspicuous wildlife on state and adjacent lands. At the same time our research into the ecology of bird communities in aspen forests, encroaching conifer forests, and forest stands that have been subjected to both fuels management treatments and efforts to enhance declining natural plant communities, indicates dynamic environmental changes on Nevada state and federal lands that are only narrowly understood. Throughout the Carson Range, environmental changes associated with succession, altered disturbance regimes, forest thinning using varied techniques, cessation of meadow grazing, and invasion of multiple plant and animal species combine to challenge the application of best management practices toward desired future conditions. To these combined interests, in 2008 we initiated research and monitoring effort, which have produced three immediate products with long-term value for the conservation and public appreciation of Nevada State Lands and adjacent public lands in the Lake Tahoe basin and surrounding Carson Range.

First, we sampled the bird fauna of the Carson Range across all vegetation and other land cover types, from lake level to the summit peaks of the range, and along the eastern slopes of the range to moderate elevations (point count stations ranged approx. 1700-3000 m). Our goal was to ensure capturing the full range of bird use, including migration and post-breeding dispersal, by sampling from early spring through late autumn 2008, with more intensive sampling of breeding birds during the breeding season, but an ankle injury sustained by Richardson prevented surveys beyond late July. Standardized, systematic breeding season surveys were completed in 2008, as planned, and additional, targeted surveys attempted to ascertain post-breeding dispersal in 2009. Toward a complete accounting and assessment of the Nevada birds of the Lake Tahoe region, the 2008-2009 field inventory has been supplemented with a thorough review and summary of the published literature, agency reports, and unpublished data collected by agency personnel, as well as several years' worth of observations and experience gained from intensive field studies in the Carson Range from 2001-2007. The primary products from this effort are a narrative description of the Carson Range distribution, breeding status, and vegetation/habitat associations of 232 recorded bird species (Annotated Species List), and a pamphlet-size checklist (prototype as APPENDIX A.).

Second, we used the 2008 sampling season to establish baseline data to support a future monitoring scheme that uses breeding birds as one taxonomic group to assess environmental change across the Nevada Tahoe basin landscape. We established 251 monitoring sites, distributed as 20 transects in dominant-vegetation cover types. These were visited twice each during the peak of the breeding season (sampling was between 21 May – 10 July). Data on species richness and abundance were recorded in a manner that will allow comparison of 2008 bird status with that in subsequent years, thereby producing reliable information on species trends. Data were gathered in a fashion that

will be repeatable by agency staff (with limited training) in the future (see **Study Area and Methods**, below). Data have been archived in a form friendly to future State Land's uses, and a ready protocol conveyed that can be repeated at time intervals chosen to meet management information needs. Although the approach here was intended as a stand-alone effort, success in meeting these goals with birds in 2008 has made them directly compatible with our plot-based butterfly monitoring of 2007, and should serve to directly inform agency land management needs. All raw bird data have been sent to David Catalano in a Microsoft Excel spreadsheet.

Third, we produced basic bird-habitat models for breeding avian species richness and abundance and key indicator bird species. These models document bird-habitat associations for key, indicator species and will be useful for predicting bird communities at given sites based on vegetation and other environmental characteristics or predicting potential changes in bird community in response to succession, climate change, disturbances such as fire, or different land management practices. Because our field season came to an abrupt, unexpected end in late July (due to PI injury), vegetation sampling was conducted in 2009. Raw environmental and vegetation data have been sent to David Catalano as a Microsoft Excel spreadsheet.

## **STUDY AREA and METHODS**

### **Study Area**

This study covered all vegetation types found in the Carson Range from Mount Rose to Stateline, emphasizing the Tahoe basin, and Lake Tahoe Nevada State Park lands in particular. We also surveyed adjacent locations on the east slope of the range down to approximately 1700m in elevation, especially where unique or underrepresented vegetation types occurred. We established 252 point count stations, arranged in 20 monitoring transects. Sampling locations were selected to meet criteria relating to logistics and accessibility and capturing the complete range of vegetation communities. We worked directly with David Catalano (NDOW, Nevada Tahoe Resource Team), to ensure that our sampling scheme complemented the three point count transects he currently monitors within the Lake Tahoe and Van Sickle Nevada State Parks. Monitoring transects were designated on the bases of avian species richness, maintaining representation of key vegetation types, and logistics. Transects comprised 10-21 points, placed  $\geq 250$  m apart to ensure sampling independence. A spreadsheet containing the UTM locality data for all points has been sent to David Catalano.

### **Point Counts**

Each transect was censused twice during the breeding season (21 May - 10 July). Counts were five-minute, fixed-radius point counts, recording songbird detections within and outside of 50m and 100m radius circles, following standards recommended by Ralph et al. (1993, 1995) and consistent with data collection of NDOW and the Great Basin Bird Observatory's Nevada Bird Count (<http://www.gbbo.org/nbc.htm>). All birds observed (including flyovers) and type of detection (sight, drumming, display flight, call, or song) were recorded. Point counts were conducted between 15 minutes after sunrise and

completed by approximately 10 am, the daily peak of bird activity, and when weather conditions are most conducive to bird activity and detection (e.g. light winds, little to no precipitation). Nocturnal birds were not sampled, though NDOW and LTBMU biologists have been sampling owls throughout the Carson Range within recent years. These species are addressed in the annotated checklist, but beyond the scope of our bird-habitat models. Explicit effort was made to determine the breeding status of each bird species encountered, particularly those for which breeding status in the Carson Range was equivocal or uncertain. Further, we made special effort to document the distribution, breeding status, and vegetation associations of species of management concern and Nevada Stewardship species, as highlighted in the Nevada Action Plan (Wildlife Action Plan Team 2006).

### **Habitat Assessments**

Detailed vegetation data were collected at all point count stations during the 2009 field season according to nationally standardized relevé protocol (Ralph et al. 1993), and used to build the bird-habitat models. In short, cover class, relative density, and species by height class and type (tree-class, shrub-class, herbaceous) for all vegetation within 50 meters of any station was recorded. We defined tree-class woody vegetation as greater than 5 m height, and shrub-class woody vegetation as being less than 5 m in height. The emphasis of these vegetation assessments was structural, and species was not recorded for herbaceous cover.

### **Data Analysis**

We calculated bird species richness (BSR) and total bird abundance (TBA) for each station, based on totals summed over the two visits. We restricted our data set to detections within 50m and further limited the indices to include species most reliably censused with the point count method. We therefore removed nocturnal species (e.g. *Strigidae*), known post-breeding dispersers, vagrants, and migrants (e.g. *Selasphorus rufus*), non-territorial or colonial species (e.g. *Laridae*), and species with territories typically too large to ensure independence of individual point count stations (e.g. *Anseriformes*, *Falconiformes*). A complete list of common and latin names for all species used in analysis is presented in Table 1.

Of the hundreds of potential vegetation and environmental variables available, we selected fifteen that we felt would best contribute to models predicting BSR and TBA (Table 2). Among these is absolute cover of "riparian" shrubs, which while not always in an riparian context, included shrub species that are associated with rich, moist soils and abundant invertebrate communities: *Acer glabrum*, *Alnus incana* ssp. *tenuifolia*, *Cornus sericea*, ssp. *sericea*, *Populus tremuloides*, *Prunus emarginata*, *Salix*, *Sambucus*, and *Sorbus californica*. We looked for highly correlated variables when building full models in an attempt to reduce dimensionality and to ensure that no highly correlated variables were causing problems associated with multicollinearity. In the Carson Range, *Populus* trees, aspen (*P. tremuloides*) in particular, comprise a vast majority of deciduous trees, thus absolute *Populus* tree cover and absolute deciduous tree cover were highly correlated. In the fully-parameterized models for both bird indices, it was found that absolute *Populus* tree cover was a significantly stronger predictor of the bird indices, so

we dropped absolute deciduous tree cover from further models of bird indices. Absolute deciduous cover was found to be a stronger predictor of presence or absence of certain species, and was therefore chosen over absolute *Populus* cover in those models. Additionally, significant interactions between variables, as well as polynomial functions of each parameter, were investigated and included in the full models as warranted.

Models were built comparing BSR and TBA against the habitat variables mentioned above. Additionally, logistic models were built to predict the presence of key species: Western Wood-Pewee (*Contopus sordidulus*), Dusky Flycatcher (*Empidonax oberholseri*), Warbling Vireo (*Vireo gilvus*), Steller's Jay (*Cyanocitta stelleri*), Red-breasted Nuthatch (*Sitta canadensis*), Audubon's Warbler (*Dendroica coronata auduboni*), MacGillivray's Warbler (*Oporornis tolmiei*), Western Tanager (*Piranga ludoviciana*), Fox Sparrow (*Passerella iliaca*), and Oregon Junco (*Junco hyemalis thurberi*). Optimal models were selected based on lowest Akaike's information criterion (AIC) score, using the STEP function, as implemented in Program R, 2.4.1 (R Development Core Team 2006), with the most-parameterized model  $\Delta\text{AIC} \leq 2$  reported. Model and parameter significance was designated at  $P < 0.05$ .

## RESULTS and DISCUSSION

### Summary Results

A total of 86 species were observed during point count surveys from the 252 point count stations, and 63 of these both 1) were recorded within 50 m of point count centers and 2) met our criteria for inclusion in analyses. These species are listed in Table 1. With such a diversity of habitat types and bird species, broad summary generalizations may not be terribly meaningful. Nonetheless, annual TBA for the Carson Range point count stations ranged from 1-38 birds, with a mean of 11.64 ( $\pm 0.40$  SE), and annual BSR ranged from 1-18 species, with a mean of 7.42 ( $\pm 0.20$  SE). Several bird species were very common and widespread, with Mountain Chickadee (*Poecile gambeli*) being far and away the most abundant and commonly recorded species. Total abundances for the 15 most commonly recorded species are summarized in Figures 1 and 2. While we attempted to cover as many habitat types as possible, this coverage was not evenly distributed. It should be kept in mind that these summary data are biased by the distribution of point count stations.

### Breeding BSR and TBA

Summary statistics for BSR and TBA models are presented in Table 3. The optimal model for predicting BSR (Table 3a) was highly significant ( $F_{8,243}=18.22$ ,  $R^2_{\text{adj}} = 0.35$ ,  $p < 0.001$ ) and retained absolute tree-class cover (-), herbaceous cover (+), tree species richness (+), tree-class *Populus* cover (+), tree-class conifer cover (+), shrub-class conifer cover (-), and cover of "riparian" shrubs (squared, +). The three most influential parameters in this model were tree-class *Populus* cover, cover of "riparian" shrubs, and tree species richness. The optimal model for predicting TBA (Table 3b) was highly significant ( $F_{8,243}=18.22$ ,  $R^2_{\text{adj}} = 0.37$ ,  $p < 0.001$ ) and retained absolute tree-class cover (-), herbaceous cover (+), tree species richness (+), tree-class *Populus* cover (+), tree-class

*Pinus* cover (+), tree-class *Abies* cover (+), shrub-class conifer cover (-), and cover of "riparian" shrubs (+). The three most influential parameters in this model were tree-class *Populus* cover, herbaceous ground cover, and absolute tree cover.

Several of the results were seemingly contradictory, notably that in absolute tree cover had a negative correlation with both bird indices, yet percent cover of various tree species often had strongly positive relationships with the bird indices. This may be a result of reduced bird detectability in dense forests, suggesting that species richness and bird abundance might be expected to rise with tree density up to a certain threshold, but then either taper or be reduced with increasing tree cover. However, no significant polynomial effects were found with either total tree cover or tree-class conifer cover. Further, despite this curious result, no significant interactions were found between total tree cover and its many subcategories (e.g. tree-class *Abies* cover). Another curious result is that cover of *Abies* and *Pinus*, or conifers as a whole, showed significant positive relationships with both bird indices, despite the fact that conifer encroachment is the principal threat to many riparian and aspen habitats in the Carson Range. When interpreting these results, it must be remembered that this dataset captures the whole range of Carson Range vegetation communities, and a majority of the point count stations occur in pure conifer forest or woodland. Consider this: only 12 (<5%) point count stations completely lacked coniferous tree cover, whereas 102 (40%) stations lacked "riparian" shrub cover, and 180 (71%) lacked *Populus* tree cover. Ongoing modeling efforts with this data, which will be published elsewhere if significant inferences can be drawn, are attempting to parse the data from various vegetation communities and analyze them separately.

Despite these confusing results, a few others are more easily interpreted. For both bird indices, the cover of tree-class *Populus* was the most influential habitat variable. Almost all of this *Populus* cover relates to aspen (*P. tremuloides*). This reinforces the findings of previous research in the eastern Sierra Nevada (Heath and Ballard 2003, Richardson and Heath 2004, Richardson 2007), suggesting that aspen typically are one of the most, if not the most, important vegetation types for bird species richness and abundance in the Sierra Nevada. Also important for predicting both bird species richness and bird abundance, was the coverage of "riparian" shrubs, most especially *Salix*. The importance of riparian vegetation to bird communities in the North American West is well documented, and these benefits are exhibited throughout the east slope of the Sierra Nevada (Heath and Ballard 2003). Tree species richness was also positively correlated for both bird indices. Because greater vegetation complexity and species richness provides greater opportunity for a diversity of resources, it is expected that greater bird species richness would follow, but greater total bird abundance is somewhat unexpected. This result is likely a reflection of the fact that tree species richness was often highest in riparian contexts. Despite this relationship, we detected no significant multicollinearity between these two parameters. Two other vegetation characteristics were consistent across both bird indices: herbaceous cover was positively correlated, and shrub-class conifers were negatively correlated. Herbaceous cover has consistently been found to be an important predictor for bird species richness and abundance in the eastern Sierra Nevada (Heath and Ballard 2003, Richardson and Heath 2004), not only indicating rich, productive soils and moisture and

sunlight (good indications of forest health), but also providing ample nesting and foraging substrates for a variety of ground-nesting species. Herbaceous cover is greatest in pure aspen stands and moist riparian or meadow contexts, and often completely absent in dense, closed-canopy conifer forest. The highest cover of shrub-class conifers is typically found where young white fir (*Abies concolor*) is growing in thickets, often overwhelming sections of the understory so that nothing else can grow. These situations provide almost no resources for most birds.

### **Presence/Absence of Key Species**

Logistic regression models are currently undergoing revision with the help of Mark Herzog, a statistician at the Point Reyes Bird Observatory. Unfortunately, because of time constraints with Mark's involvement, combined with the need to submit this report by the end of February, these results will not be included in this report. It is hoped that these model revisions can be completed to satisfaction in the coming months, at which time a brief follow-up report will address those results. These models will address the habitat parameters that best predict occurrence of the following key species: Western Wood-Pewee, Dusky Flycatcher, Warbling Vireo, Steller's Jay, Red-breasted Nuthatch, Audubon's Warbler, MacGillivray's Warbler, Western Tanager, Fox Sparrow, and Oregon Junco.

## **Project Recommendations**

With the goal of enhancing and protecting Carson Range breeding bird populations and their habitat, we provide 10 habitat, management, and monitoring recommendations. The recommendations are based on results from the 2008-2009 survey, as well as the literature survey, discussions with other wildlife professionals working in the range, and our own extensive experience with the avifauna of the Carson Range and the greater Lake Tahoe area.

1. Maintain vegetative structural diversity and habitat complexity. When considering the habitat needs of the entire Carson Range breeding bird community, versus the needs of a few indicator species across the range, it is clear that maintaining diverse vegetative structure and complexity is highly beneficial. Structurally and taxonomically diverse vegetation provides a greater variety of nesting and foraging substrate, thus encouraging a greater avian diversity. Depending upon the habitat and vegetation in question, this can hold true at both the stand and landscape scales.

2. Maintain and encourage a diversity of riparian habitat types.

Open, extensive willow and pure aspen riparian habitat types typically held the richest and densest breeding bird communities found in the Carson Range, but other riparian habitat types were also high in bird species richness and abundance. Additionally, several species had more specialized requirements within the spectrum of riparian vegetation: Winter Wrens were only found in densely vegetated, steep, shady canyon streams with tangles of *Alnus*, and Lincoln's Sparrows required saturated soils with dense herbaceous vegetation. These habitat types can be vastly different from one another structurally, yet all provide different habitat niches for riparian breeding birds. Maintaining a diversity of riparian habitat types will sustain breeding bird diversity across the Carson Range.

3. Maintain conifer forests to limit tree densities. None of our point count sampling stations were in excessively dense conifer cover, as that can severely limit bird detection and bias sampling. Therefore, we were unable to detect significant polynomial relationships between bird indices and conifer cover. We expected polynomial relationship based on the simple fact that few birds are found where conifers have grown into extremely dense stands. In the interest of forest health and fuels reduction, many of these stands are being systematically thinned, a process that also will promote the health of Carson Range bird populations.

4. Maintain large, pure, viable stands of *Populus* cover. The percentage of tree-class *Populus* cover (which was almost exclusively aspen (*P. tremuloides*) in the Carson Range) had the strongest positive effect size in predicting both breeding bird species richness and bird abundance in 2008. A more focused study of bird communities in aspen across the eastern Sierra, including the Carson Range, found that mature, pure aspen stands had the highest species richness and abundance, and that conifer encroachment was negatively correlated with these indices (Richardson and Heath 2004). Maintaining large, pure aspen stands in the Carson Range primarily entails monitoring and limiting conifer encroachment into existing stands.



5. Maintain and encourage herbaceous ground cover. Percent herbaceous cover was significantly positively correlated with both breeding bird species richness and abundance. Cover of forbs and grasses is densest in moist meadow, riparian, or aspen contexts and sparsest in dense conifer stands. Thinning overgrown conifer stands can encourage growth of both understory shrubs and herbaceous cover, by making more sun and moisture available.

6. Maintain and encourage the cover of "riparian" shrubs, especially willow. Both breeding bird species richness and breeding bird abundance had very strong positive correlations with percent "riparian" shrub cover in the Carson Range. While not necessarily in a riparian context, these were shrub species that are associated with rich, moist soils and abundant invertebrate communities (e.g. *Salix*; see Methods, for list). Many of these shrubs (e.g. *Prunus*) exist on moist shrub-dominated hillsides or in forest clearings, which may be susceptible to conifer encroachment. These habitats, as well as riparian and meadow habitats, need to be monitored and managed to limit conifer encroachment.

7. Limit high-disturbance management activities (e.g. vegetation removal) to the non-breeding season, especially for habitats with limited areal extent in the Carson Range. Reproductive efforts are extremely taxing on birds, and disrupting these efforts in the middle of a breeding season can have significant impacts on an individual's fitness. The breeding season for birds begins prior to the laying of eggs, when mate and territory selection, nest location choices, and nest-building take place. Songbirds typically take at least a month after the first egg is laid to fledge and care for young, and many species are dependent upon their parents for weeks after fledging. The breeding season for most birds in the Carson Range is from mid-May through early September; June and July are the peak breeding season months. The optimal timing for high-disturbance management activities in sensitive habitats is from mid-September through early May, depending on elevation and aspect. Potentially sensitive habitats with limited extent in the Carson Range include aspen, riparian, and west slope chaparral.

8. Use standardized monitoring protocols. By standardizing protocols, biologists can ensure that results can be compared across space and time. The USDA Forest Service published guidelines for standardized monitoring techniques for monitoring birds (Ralph et al. 1993), and our efforts here were designed with compatibility in mind.

9. Consider reproductive success when monitoring populations and assessing habitat value. Local reproductive productivity is a critical element of a bird population's viability in an area. Low reproductive success may indicate a nonviable population, despite high bird density (Pulliam 1988). By determining the factors associated with low reproductive success, monitoring may identify which management and restoration actions can help minimize or reverse songbird population declines.

10. Conduct intensive, long-term monitoring at selected sites. Long-term monitoring should be conducted at reference sites that embody the conditions that restoration and management efforts strive to recreate. Long-term, intensive monitoring at key

experimental sites can test the assumptions that currently drive restoration and management practices. Intensive monitoring includes collecting data on primary demographic processes and associated habitat characteristics and seeks to identify causal connections between habitat variables and the diversity and viability of bird populations. Biologists collect data on reproductive success, breeding densities, reproductive success, parasitism, survival, vegetation data, suitable habitat requirements, and general life-history information. Land managers can then employ these data to make well-informed, responsive management plans in an adaptive framework.

## ANNOTATED SPECIES LIST:

### **Canada Goose** *Branta canadensis*

Canada Geese are common breeders along Lake Tahoe's edge, especially wherever nearby grassy vegetation provides access to grazing. In the absence of hunting pressures, Canada Geese have become extremely tame at Lake Tahoe and can be found exploiting not only wet meadows, but also landscaped lawns: golf courses, parks, and people's yards. Canada Geese will remain resident at Tahoe as long as grassy forage and submerged aquatic vegetation are accessible, and breeding commences extremely early in most years, typically by the end of March. Large flocks form in fall and early winter, with local birds congregating together joined by an influx of geese from other areas. A small percentage of Tahoe geese have been leg-banded and an even smaller percentage neck-collared; thus far all reports are of birds that originally had been banded, often as flightless young, in the western Great Basin (e.g. Reno, Sparks, Stillwater, etc.).

### **Greater White-fronted Goose** *Anser albifrons*

#### **Snow Goose** *Chen caerulescens*

#### **Ross' Goose** *Chen rossii*

#### **Cackling Goose** *Branta hutchinsii*

During late fall and early winter (until snow depth prevents grazing), small numbers of these geese occasionally touch down in the Tahoe basin. The two *Chen* and Cackling Goose most commonly can be found among the larger flocks of Canada Geese at the Edgewood Golf Course. Greater White-fronted Goose can be numerous in some years (although stopovers for individual birds typically last less than a week) and is more likely to be discovered along the lakeshore, either in pure groups, or in association with Canada Geese. These species can occasionally be found in spring as well.

### **Tundra Swan** *Cygnus columbianus*

Most of the swans found at Tahoe touch down due to inclement weather. Few linger once the skies clear up, but while at Tahoe they are most often found along the lakeshore or further out in the lake resting in flocks. Nonetheless, Tundra Swans are regular transients to Tahoe, particularly in November and December.

### **Mallard** *Anas platyrhynchos*

The Mallard is the most common and widespread duck in the Carson Range, adapting to a wide variety of aquatic habitats. They may be found breeding all along Lake Tahoe's edge, at all larger ponds and reservoirs, but even in tiny, hidden ponds and marshy areas along creeks. Numbers are greatest from September through mid-December. Most of these birds leave for lower elevations during the winter freeze, but a few congregate at various points along Lake Tahoe's shoreline. Like the Canada Goose, this species has become quite tame and adapted well to living in close proximity to human activity. Breeding usually commences in April.

### **Common Merganser** *Mergus merganser*

Mergansers are common breeders all around Lake Tahoe's shoreline, and appear to be resident, with little fluctuation in numbers. This steady seasonal distribution was also

noted by Orr and Moffitt (1971). Within the area, however, there is some seasonal movement. Throughout the summer, groups of females with young can be seen throughout the area, but by early June, most of the males in the Tahoe Basin have retreated to the Nevada side of the lake. Here they are able to safely hide among the rocks while undergoing their cryptic eclipse molt cycle (at which time they look very much like females). A large flock of males also congregates in Marlette Lake for this same purpose, and has been observed foraging in a collective, synchronized effort comprising dozens of individuals. During the first half of August, these males lose all of their flight feathers, rendering them quite vulnerable. The birds along Tahoe use the rocky shoreline for safety, while the Marlette flock probably benefits from a combination of its secluded location and the safety of a tight, cohesive foraging flock. By mid-October, males once again can be seen in their breeding plumage, and they fan out to repopulate the rest of the Tahoe basin. Many nests are located in trees, often in cavities formed where limbs have fallen off, but most typically in the hollow, broken off tops of tall snags or topped live trees. Mergansers will also nest in hollow logs, burrows, or rock crevices, the latter of which are in high supply along Nevada's rocky Tahoe shoreline, and Orr and Moffitt (1971) describe one such nest found among the boulders south of Glenbrook, and a similar report from Zephyr Cove.

**Wood Duck** *Aix sponsa* \*

**Gadwall** *Anas strepera*

**American Wigeon** *Anas americana*

**Cinnamon Teal** *Anas cyanoptera* \*

**Northern Shoveler** *Anas clypeata*

**Northern Pintail** *Anas acuta* \*

**Green-winged Teal** *Anas crecca* \*

**Canvasback** *Aythya valisineria*

**Redhead** *Aythya americana* \*

**Ring-necked Duck** *Aythya collaris* \*

**Greater Scaup** *Aythya marila*

**Lesser Scaup** *Aythya affinis*

**Bufflehead** *Bucephala albeola* \*

**Common Goldeneye** *Bucephala clangula*

**Hooded Merganser** *Lophodytes cucullatus*

**Red-breasted Merganser** *Mergus serrator*

**Ruddy Duck** *Oxyura jamaicensis* \*

The list of ducks above represents the most regularly occurring species in the Lake Tahoe basin, either in migration, through the winter, or as current or historic breeders (marked with an asterisk). Migrants can show up at any part of Lake Tahoe itself, and smaller bodies of water in the Carson Range, such as Spooner Lake, the ponds at Edgewood, or the beaver ponds of Lower Prey Meadows, may attract these species for short periods of time. It is unknown whether any of the breeding species ever breed or have bred, on the Nevada side of the Tahoe basin.

### **Sooty Grouse** *Dendragapus fuliginosus*

The Sooty Grouse is a resident breeder in mature forest of various types throughout Carson Range. During late summer and fall, the birds tend to move up in elevation (Orr and Moffitt 1971), and hens with young can often be found at this time in meadows and aspen habitats that have remained moist. Within the Tahoe region, grouse are believed to prefer Red Fir forests in winter (Price 1904). According to anecdotal, historical accounts, this species was extremely abundant prior to Comstock-era deforestation:

“The whole pine-timbered region lying along the eastern slope of the Sierras west of the Carson Valley, was formerly the home of very great numbers of this fine bird. Some of the stories told by the early settlers of its abundance are almost incredible.”

(Henshaw 1877, p. 1320)

### **Mountain Quail** *Oreortyx pictus*

Mountain Quail are fairly common breeders in open forests with shrubby understories and chaparral slopes throughout the Carson Range. Prior to winter, most Mountain Quail migrate out of the Tahoe basin in coveys, with Carson Range birds retreating to lower elevations on the east slope. Birds that remain in the Tahoe basin occasionally can be found at the elevation of Lake Tahoe (hereafter “lake-level”) during or shortly after storms, or congregated around bird feeders in residential areas. Early winter storms can bring large amounts of snow to the Carson Range, with little warning, so this downslope movement is timed to precede such events. Fall migration takes place over the month of September, beginning like clockwork around the first of the month, and ending by early October (Barlow and Price 1901, Belding 1903, Orr and Moffitt 1971). The timing of the spring migration is less definite but appears to be more protracted and probably tied to weather conditions and snow depth. Further, the upslope migration is made more difficult to track by the fact that spring birds appear to travel singly or in pairs (Barlow and Price 1901).

### **California Quail** *Callipepla californica*

This species was originally introduced into western Nevada in 1862, in the vicinity of New Empire (Leopold 1977). Since those initial releases, the species has successfully expanded to a large area of western Nevada. It also is believed that California Quail have, at times, been introduced into various parts of the Lake Tahoe basin. Curiously, the species is not mentioned on ESIA (1994) or LTAS (1978) Tahoe checklists, nor in Kelleher (1970). Orr and Moffitt (1971) discuss north lake records from the 1920s, so it is entirely possible that the species disappears from the Tahoe basin at times. Currently, they are commonly found in open habitats of the Carson Range during summer. California Quail also currently winters at Glenbrook, where they may benefit from the presence of bird feeders. Leopold (1977) suggests that California Quail and Mountain Quail occupy clearly differentiated habitats within the landscape, but I have observed a large degree of overlap in the Carson Range.

**Chukar** *Alectoris chukar*

Chukar, which were introduced to Nevada in the 1950s, have become well established in many parts of the state, but they have not established themselves in the Carson Range. They are occasionally seen at Tahoe, however. According to Tahoe birder lore, Chukar are released annually for a Thanksgiving Day hunt in the Kingsbury Grade area. I have been unable to confirm details surrounding the annual release, but Chukar are occasionally seen in the neighborhoods of the area around that time. Birds that manage to avoid being shot are usually confronted with deep snow soon thereafter, and it is doubtful that any survive the winters.

**Wild Turkey** *Meleagris gallopavo*

In 1963, Merriam's Turkeys from South Dakota were released into the Carson Range and soon supported Nevadas first hunted population. Limited hunting seasons were held during the falls of 1965-1967, but lack of hunter success brought attempts to establish the species in the Carson Range to an end. Presumably, the turkeys all died out within a few years.

**Pacific Loon** *Gavia pacifica*

**Common Loon** *Gavia immer*

**Yellow-billed Loon** *Gavia adamsii*

Loons are regular migrants to Lake Tahoe, with regular stopovers in November and December, a few wintering birds, and then many spring visitors, especially in April. While at Lake Tahoe, their distribution appears to be dictated largely by the lake's bathymetry, and where food resources are concentrated, and most are seen along the lake's north and west shores. That said, loons are regularly detected from Nevada vantages such as Memorial Point and Logan Shoals. Common Loons greatly outnumber the other species, with Pacific Loons representing perhaps 5-10% of loon records at Tahoe. There is only one record of Yellow-billed Loon within Nevada waters at Lake Tahoe: 6 January 1973 seen off Incline Village by D. DeSante and J. Farness (Remsen Jr. and Binford 1975). The Yellow-billed Loon is a rare but increasingly regular in western Nevada (Pyramid Lake, Sparks Marina, reservoirs on the Colorado River), so they may be expected to turn up again on Lake Tahoe, and occasional birds are probably overlooked.

**Pied-billed Grebe** *Podilymbus podiceps*

Pied-billed Grebes prefer quiet, still waters with dense marsh vegetation. The species is an uncommon breeder in wetlands around the southern end of the Tahoe basin, but unknown as a breeder in the Carson Range. Small numbers of migrants pass through the area, so the species can be detected almost anywhere around the lakeshore, as well in smaller bodies of water, such as Spooner Lake. Numbers peak from mid-August through mid-November.

**Horned Grebe** *Podiceps auritus*

This species is highly unpredictable at Lake Tahoe. In some years, they may be found easily, but at other times they may not be seen for several years on end. Orr and Moffit (1971) reported being unable to find the species at Tahoe, despite concerted effort, during

the falls of 1924-1926. The following March they collected two. As with the Eared Grebes, this species may be encountered anywhere on the lake, however, during the late 1990s through early 2000s, a small group reliably wintered in Crystal Bay.

**Red-necked Grebe** *Podiceps grisegena*

This is the most rare of the grebe species at Lake Tahoe, typically only seen every few years. Records from the Nevada shoreline are even scarcer. In Nevada, Red-necked Grebes have been recorded from places like Cave Rock and Stateline Point.

**Eared Grebe** *Podiceps nigricollis*

Eared Grebes are fairly common spring, and especially fall, migrants at Lake Tahoe, but can occur during any month. They may be found just about anywhere around the lake's edge. They are also regular visitors to Spooner Lake during migration. Coleman (1927) reported small numbers breeding at Lake Forest, in *Scirpus*, during the low lake levels of 1926. Eared Grebes also were more common as a breeder in Rowlands Marsh in historic times, although no breeding has been documented since the construction of the Tahoe Keys. Thus, it is probable that the species formerly bred in suitable habitat on the Nevada side of the lake, at least occasionally.

**Western Grebe** *Aechmophorus occidentalis*

**Clark's Grebe** *Aechmophorus clarkii*

*Aechmophorus* grebes are regular visitants to Lake Tahoe throughout most the year, although heavy winter storms appear to drive most to lower elevations. Despite seemingly large numbers on the lake in mid-summer, neither species breeds at Lake Tahoe, and they are seldom seen near shore. Because of the similarities between the two species, and the fact that they congregate in deeper water (beyond the limits on scope-assisted identification from shore), the seasonal ratios of these two species remain unclear. Attempts to bird deeper water by kayak in recent years have shed some light on the matter, albeit anecdotal. By my best estimation, birds from late fall through spring migration are far more likely to be Westerns, but ratios are more even in summer; Clark's may even slightly outnumber Westerns in summer. Systematic boat surveys could easily resolve this question.

**American White Pelican** *Pelecanus erythrorhynchos*

Migrants can be seen in spring and fall, and post-breeding dispersers, especially young of the year, will occasionally stopover at various points around the lake, especially along the North Shore. During summer, birds from the breeding colony at Pyramid Lake regularly make long-distance foraging runs across a vast area of northern California and Nevada (Yates 1999, Scoppettone et al. 2006, Wiemeyer and Saake 2007), and these birds may be seen, often wheeling high overhead, in transit between Pyramid Lake and some other body of water. Water depths at Lake Tahoe and elsewhere in the Carson Range are not conducive to the fishing strategies of American White Pelicans, so those birds that do drop in usually move on within 24 hours. Occasionally birds will linger at shallower bodies of water, and the ponds of the Edgewood Golf Course and even Spooner Lake sometimes host pelicans.

**Double-crested Cormorant** *Phalacrocorax auritus*

This species does not breed in the Carson Range, nor elsewhere at Lake Tahoe. Nonetheless, it is a regular transient in the spring and especially fall, but with records from throughout the calendar year. They are seldom seen away from the lake itself, or its larger tributaries. Orr and Moffitt (1971) speculated that cormorants seen at Lake Tahoe came from breeding colonies in the western Great Basin, with Pyramid Lake being most likely.

**American Bittern** *Botaurus lentiginosus*

Both species of bittern formerly bred at Rowlands Marsh, on the California side of the Tahoe basin, but it is uncertain if appropriate breeding habitat ever existed in the Carson Range. American Bittern is still a regular transient to Tahoe, and occasionally turns up on the Nevada side of Lake Tahoe.

**Great Blue Heron** *Ardea herodias*

**Great Egret** *Ardea alba*

**Snowy Egret** *Egretta thula*

**Green Heron** *Butorides virescens*

No species of ardeid herons breed in the Carson Range, or elsewhere at Lake Tahoe, but all of the species listed above do visit the region, particularly from late summer through late fall, and may be seen in appropriate habitat on the Nevada side of the Tahoe basin. Great Blue Heron is the most commonly and widely encountered species, and may occur well into winter across a variety of wet habitats. Great and Snowy Egrets are regular transients to the region, typically found along the shore of Lake Tahoe, but seldom linger for more than a day or two. Green Heron is a rare vagrant.

**Black-crowned Night-Heron** *Nycticorax nycticorax*

Black-crowned Night-Herons are fairly nocturnal, which, combined with their secretive nature, means that their true distributional status in the region is somewhat unclear. During the day, they are typically encountered in riparian contexts, where the vegetation is tall and thick enough to provide well-concealed day roosts. Occasionally in the late summer and fall, large aggregate day roosts may be found in tall willow thickets or even dense stands of lodgepole pine. I know of no breeding records for the Carson Range, or elsewhere in the Lake Tahoe basin, although young of the year may be found at Tahoe as early as the first week of June. Birds seen in the Carson Range surely represent post-breeding dispersers from nearby colonies in the western Great Basin, sometimes as near as Washoe Lake (Alcorn 1988).

**White-faced Ibis** *Plegadis chihi*

Ibis are a fairly regular visitor to Tahoe through the summer and may be encountered where the mouths of tributaries create shallow deltas of soft sediment in Lake Tahoe, but rarely are found along the Nevada shoreline. They are often found singly, with larger groups found in May but especially in August and early September. In most years, thousands nest in the Lahontan Valley, a short flight to the east (Chisolm and Neel 2002).



### **Turkey Vulture** *Cathartes aura*

This species can be seen at Tahoe from mid April through September, with occasional stragglers being seen through December. On the east side of the Carson Range, northbound Turkey Vultures may be seen as early as mid March. They are fairly visible foraging overhead throughout the summer, but are not known to breed in the region at this time; formerly, they were believed to nest at Cave Rock and known to breed at other low-elevation cliffs around Lake Tahoe (Orr and Moffitt 1971). Ray (1903) suggests that the species was quite common at Tahoe during the summers of 1901-2.

### **Osprey** *Pandion haliaetus*

Orr and Moffitt (1971) considered Osprey to be rare visitors to Lake Tahoe and extirpated as breeders sometime since documented nesting in 1875. Almost exactly 100 years later they returned, and now there are many pairs nesting around the lake. Adults are often seen foraging above the Tahoe's shoreline or smaller bodies of water such as Spooner or Marlette Lake. Ospreys also regularly hunt over smaller bodies of water, such as small ponds or wetlands, where they catch regularly exploit introduced fish, such as bullhead (*Ameiurus* sp.), bluegill (*Lepomis macrochirus*), bass (*Micropterus* sp.), and even goldfish (*Carassius auratus*). Between these species and non-native salmonids (*Oncorhynchus mykiss*, *O. clarkii*, *O. nerka*, *Salmo trutta*, and *Salvelinus fontinalis*), it is questionable whether modern Carson Range Osprey ever prey upon native fish species. Nests not situated along a shoreline are often set back in mature forest a considerable distance from the water's edge ( $\geq 2.5$  km), although this scenario is more common on the California side of Lake Tahoe. In the Carson Range, the most visible nests typically are along Hwy 28 south of Incline Village. Precise records of their return to nesting in the Carson Range seem to be in disagreement, but the first attempt was probably in 1976 (Ryser 1985), and successful breeding was documented two years later (Kingery 1978a). They are present from the last days of March through October, with occasional stragglers persisting into December. Breeding Ospreys are monitored annually by the USFS LTBMU and TRPA.

### **Bald Eagle** *Haliaeetus leucocephalus*

Due to shifts in food resources and a rebounding population, Bald Eagles possibly may be more common in the Carson Range and Lake Tahoe area now, than at any other time in history. Orr and Moffitt (1971) briefly alluded to persecution by both local Native Americans and European settlers, and described the species as an "infrequent summer visitant," only listing nesting records from the 1870s. The species experienced further continent-wide declines with the use of DDT, starting in 1947, although Orr and Moffitt's (1971) account suggests that the species was already extirpated as a breeder in the Tahoe region at this time. Banned use of DDT in 1972 and reduced persecution have led to a dramatic population increase after 1980, an increase that appears to be continuing. One of Tahoe's longest-established and best known nests is at Marlette Lake. The site was first documented in 1996, though successful breeding did not occur until 2000. At present, this is the only known nesting site in the Carson Range. Roost sites in the Carson Range are believed to occur in the Marlette and Bliss creek watersheds (Schlesinger and Holst 2000), but this has not been confirmed as far as I am aware. Through much of the year, Bald Eagles at Tahoe take advantage of an array of introduced

fish species as prey, including rainbow (*Oncorhynchus mykiss*) and cutthroat trout (*O. clarkii*), and even bullhead (*Ameiurus nebulosus*). Numbers increase during the fall when introduced kokanee salmon (*Oncorhynchus nerka*) spawn in Lake Tahoe's tributaries. While the salmon are running, densities of Bald Eagles actually tend to be highest in the Little Truckee River watershed (where kokanee also spawn), to the north of the Carson Range, but many of those eagles appear to drift south afterwards, resulting in the highest densities annually, in late fall and early winter. During the winter, Bald Eagle diets appear to be largely waterfowl at Lake Tahoe, but especially coots, which are plentiful. There is a subtle decrease in the local population from mid-February through mid-March, when many of the birds commute over to exploit the calving season in the nearby Carson Valley, where calf placentas and occasional stillborn calves provide a unique mid-winter boost for their diet. As this season winds down, many of the eagles return to Tahoe before heading north to their respective breeding grounds. Breeding Bald Eagles are monitored annually by the USFS LTBMU and TRPA.

**Northern Harrier** *Circus cyaneus*

This species prefers to hunt over relatively flat, open fields and meadows, a habitat in very limited supply in the Carson Range. During summer, birds from the valleys immediately to the east of the range will occasionally drift upslope to hunt over the chaparral lower east slope. During late summer through fall, harriers can occasionally be seen migrating and hunting over the open ridgetops along the crest of the range.

**Sharp-shinned Hawk** *Accipiter striatus*

**Cooper's Hawk** *Accipiter cooperii*

**Northern Goshawk** *Accipiter gentilis*

All three species of Accipiter are monitored by the various land-management agencies of the Lake Tahoe basin, most aggressively, perhaps, by the USFS LTBMU. As secretive birds with large home ranges, none is encountered commonly during the breeding season, but all three species are encountered with some regularity by alert observers that frequent forested habitat. The two smaller species, however, are quite commonly encountered during post-breeding dispersal and migration, especially along riparian areas and meadow edges with willows, where migrant passerines tend to congregate. Peak concentrations of accipiters occur during September, particularly near lake level. During migration and winter, both of the smaller accipiter species also will linger near bird feeders. Contrary to Orr and Moffitt's (1971) assertion that Northern Goshawks vacated Tahoe in winter, they are resident year-round, and can be found breeding from lake-level to treeline in a variety of forest types (Keane 1999). It is unknown how low the species breeds on the east slope of the Carson Range.

**Red-shouldered Hawk** *Buteo lineatus*

This species does not breed in the Carson Range, but it appears to have become an increasingly common visitor to the region over the last 20 years. Red-shouldered Hawks frequent forested meadow edges but increasingly visit populated neighborhoods with a high prey base of birds and rodents, especially in winter. Birds in the Carson Range generally first arrive from lower elevations in late summer. The first heavy snowfalls force any lingering Red-shouldered Hawks down to lake level, where they can be quite

conspicuous, but prolonged cold temperatures and heavy snow generally expel these hawks from the Tahoe basin.

**Red-tailed Hawk** *Buteo jamaicensis*

The Red-tailed Hawk is the most common buteo in the Carson Range, and seems to thrive in a wide array of vegetation types. Notoriously adaptable, they can be seen taking Rock Pigeons at the casinos or hunting over surprisingly dense forest, where they have been known to successfully catch Douglas Squirrels (*Tamiasciurus douglasii*, Miller 1920), but most commonly they hunt over open habitats such as ridgetops, chaparral slopes, and grassy meadows. Nowhere, however, is the species densely distributed. During late summer and fall, numbers swell slightly, and multiple birds can often be observed in the Mount Rose area. Fall migration through the Carson Range is fairly protracted, and a regular spring migration along the range has not been observed.

**Rough-legged Hawk** *Buteo lagopus*

This arctic breeder is probably annual during late fall and early spring migrations, with a few winter visitants, but they are seldom encountered. Rough-legged Hawks never seem to linger in the Carson Range, or elsewhere at Lake Tahoe, for more than a day or two, and winter numbers within the broader region fluctuate drastically from year to year. For example, in some years wintering Rough-legged Hawks can be densely abundant in the agricultural fields to the immediate east of the Carson Range (Carson Valley); in other years they appear to be entirely absent from western Nevada and Northern Nevada. Typical winter habitat for this species comprises meadows dotted with willows (e.g. Rabe Meadows, Little Valley).

**Golden Eagle** *Aquila chrysaetos*

This species has not been known to breed in the Carson Range, though birds from nearby mountain ranges occasionally can be seen hunting along the Carson's high open ridges, particularly in Mount Rose area. Golden Eagles most commonly are encountered in the Carson Range during summer through fall, although they may be seen at any time of the year.

**American Kestrel** *Falco sparverius*

This small falcon is never terribly common, but occurs in open areas from the lake's edge up to the highest peaks. As a breeding species in the Carson Range, they most commonly can be found utilizing cavities in treeline woodlands, from which they hunt the open terrain of the high ridges. The meadows and marshes of lower elevations are more prone to visitation by post-breeding dispersers and migrants.

**Merlin** *Falco columbarius*

This visiting migrant is almost exclusively seen at Tahoe during the fall, most often encountered buzzing the shorebird flocks on the California side of Lake Tahoe. Occasionally, however, Merlin are seen migrating along the Carson Range ridgeline, where they hunt passerines. While this species winters sparsely in the valleys immediately to the east of the Carson Range, it is unlikely that Merlin are able to find enough avian prey in the Carson Range itself during typical winters. However, there are

several mid-winter records. Occasionally Merlin will set up shop in the vicinity of bird feeders, much in the vein of the smaller accipiters and Northern Pygmy-Owls. Wheeler (2003) suggests that Merlin may be nomadic in winter, and these records likely represent birds wandering in search of adequate avian prey to make it through the winter.

**Peregrine Falcon** *Falco peregrinus*

This species is not believed to have ever bred in the Carson Range, and summer records are few, but an observation at Cave Rock 5 June 1999 is compelling. Presumably this site could constitute suitable nesting habitat if the birds were able to habituate to all the human activity. A few pairs do nest in the broader region, and are increasing in number, and Peregrines are increasingly commonly seen along parts of the California shoreline of Lake Tahoe, so records of birds foraging over the Carson Range might be expected to increase in the future.

**Prairie Falcon** *Falco mexicanus*

This species does not nest in the Carson Range, but during summer and fall, regularly can be observed hunting over the open habitats of the high ridgetops. In late fall and early winter, migrant Prairie Falcons sometimes hunt the open habitats of lake-level wetlands.

**Virginia Rail** *Rallus limicola*

Virginia Rail can be found breeding in a variety of marshy habitats in the Carson Range, some quite small in extent. Examples include as the pond along Bliss Creek, the pond at Rabe Meadows, and the beaver ponds in Lower Prey Meadows. Because this species is so secretive, its seasonal distribution in the Carson Range is largely unknown, although it is a migrant species absent during winter.

**Sora** *Porzana carolina*

Sora have much less catholic habitat requirements than Virginia Rail, demanding more expansive areas of inundated grasses, sedges, reeds, or rushes. The two species co-occur in many wetlands, but the Sora is largely restricted to lake-level marshes. Like the Virginia Rail, the Sora is a migrant whose seasonal distribution in the Carson Range is poorly understood.

**American Coot** *Fulica americana*

Coots breed in flooded wetlands on the California side of the Tahoe basin, and wintering birds swell their numbers considerably starting in late summer. I am unaware of any breeding records for the Carson Range, but migrant coots regularly stopover at Spooner Lake. Large masses of coots can be seen in Lake Tahoe itself from fall through spring, and these birds are believed to constitute a significant part of wintering Bald Eagles' diets at Tahoe.

**Snowy Plover** *Charadrius alexandrinus*  
**Semipalmated Plover** *Charadrius semipalmatus*  
**Black-necked Stilt** *Himantopus mexicanus*  
**American Avocet** *Recurvirostra americana*  
**Greater Yellowlegs** *Tringa melanoleuca*  
**Willet** *Catoptrophorus semipalmatus*  
**Long-billed Curlew** *Numenius americanus*  
**Marbled Godwit** *Limosa fedoa*  
**Sanderling** *Calidris alba*  
**Western Sandpiper** *Calidris mauri*  
**Least Sandpiper** *Calidris minutilla*  
**Baird's Sandpiper** *Calidris bairdii*  
**Pectoral Sandpiper** *Calidris melanotos*  
**Dunlin** *Calidris alpina*  
**Short-billed Dowitcher** *Limnodromus griseus*  
**Long-billed Dowitcher** *Limnodromus scolopaceus*  
**Wilson's Phalarope** *Phalaropus tricolor*  
**Red-necked Phalarope** *Phalaropus lobatus*

The list of shorebirds above represents the most common migrants to the Lake Tahoe basin, each species occurring annually. The Carson Range hosts very little to no attractive habitat for these shorebird species, and what habitat exists is likely to be passed over en route to the more expansive shorebird habitats of the California portion of the Lake Tahoe basin, but individuals the abovementioned species can be expected to stopover at shoreline habitats or pond edges, within Nevada's portion of Lake Tahoe, on occasion. Wilson's Phalarope actually breed in the California portion of the Tahoe basin but is not expected in the Carson Range except as a post-breeding disperser or migrant. Avocets, stilts, willets, and curlews breed within a few hours's flight of Tahoe, and can be found throughout the summer months, whereas the other species are typically only found during spring and fall migrations. Tahoe lures few shorebirds during spring migration, which occurs during April and May, and fall migration is protracted from late June through November, depending on the species.

**Killdeer** *Charadrius vociferous*

Killdeer are the most common breeding shorebird at Lake Tahoe and in the Carson Range. Their seasonal distribution along the lakeshore appears largely to be dictated by weather, but most birds vacate the Tahoe basin by mid-November and do not return until mid-March (or later). Killdeer can be found nesting wherever barren or semi-barren areas of low slope angle occur at or near the water's edge, most commonly along beaches of Lake Tahoe itself, but also at Spooner Lake and other similar settings.

**Spotted Sandpiper** *Actitis macularius*

Less common and less vocal than Killdeer, but perhaps more widespread, Spotted Sandpipers breed in a variety of shoreline or creekside contexts. In some years, they may be found nesting at some of the high ponds in the Relay Peak area. This species formerly bred at Incline Lake, but it is unclear whether it persists now that the lake has been drained. The bulk of Tahoe's Spotted Sandpipers arrive in May and depart by the end of

September.

**Wilson's Snipe** *Gallinago delicata*

Snipe are uncommon breeders in wet, grassy meadows and marshes from lake-level to Tahoe Meadows in the Mount Rose area. They are quite secretive outside of the breeding season, so their precise seasonal distribution is unclear. Numbers definitely diminish during the winter months, although birds have been found through the winter at lake-level; numbers peak during fall migration.

**Bonaparte's Gull** *Larus philadelphia*

**Ring-billed Gull** *Larus delawarensis*

**California Gull** *Larus californicus*

**Herring Gull** *Larus argentatus*

Three species of gull regularly spend time at Lake Tahoe, the most common of which is the California Gull. Historically, this species has always maintained a year-round presence, though numbers tend to increase in the fall and early winter. The second-most common gull at Tahoe is the Ring-billed, a species that was formerly only a fall visitor, but which now can also be found year-round, and has been extending its breeding range southward into the Great Basin in recent decades (Conover and Conover 1981, Gubanich and Judd 1988). Occasionally, this is the more common gull seen on winter days, but this likely is just a matter of time and place. They are almost always outnumbered at the lake by California Gulls, even if the California Gulls are elsewhere for the moment. Herring Gull is a winter visitor to Lake Tahoe in small numbers, with numbers peaking October through December. Bonaparte's Gull is a passage migrant, typically only seen during spring and fall. Several other gull species have been recorded at Tahoe, but never on the Nevada side.

**Parasitic Jaeger** *Stercorarius parasiticus*

**Long-tailed Jaeger** *Stercorarius longicaudus*

**Sabine's Gull** *Xema sabini*

**Common Tern** *Sterna hirundo*

**Arctic Tern** *Sterna paradisaea*

From late August through mid-October, early season storms and high winds bring the promise of "commic" terns, jaegers, and Sabine's Gulls to the north end of the lake, and such birds are typically seen during or just after a period of stronger winds. In reality jaegers may be even more regular than records suggest, but visits are probably brief unless there are large numbers of terns around to parasitize. Prevailing winds appear to concentrate these birds along the north shore, where they most typically are seen. Of the jaegers, records are almost evenly split between the two, but Parasitic may be slightly more regular than Long-tailed. Both species are likely annual, or nearly so, at Lake Tahoe, but they are seldom seen from Nevada's shoreline. A Long-tailed Jaeger was found washed up at Sand Harbor on 2 August 1999 and is now preserved in the UNR collection (NBRC-1999-14). The other three species also are seldom observed from Nevada's shoreline, and the bathymetry of the northeast corner of the lake may be too steep to sufficiently provide food resources to attract these species. Sabine's Gulls and Common Terns are probably annual at Tahoe in small numbers, whereas Arctic Terns are

only seen every few years. While I know of no documented records for these three in Nevada's Tahoe waters, it is almost certain that they regularly traverse the political boundary near Stateline Point.

**Caspian Tern** *Sterna caspia*

Caspian Terns do not breed at Tahoe, but individuals or small groups can be seen hunting at the lake from mid-April through September. It's not uncommon to find juveniles begging from adults in August and September. These youngsters may look and act feeble, but they're perfectly volant and have followed one or both of their parents to Tahoe from nearby breeding colonies.

**Forster's Tern** *Sterna forsteri*

Forster's Tern is the only species presently breeding at Lake Tahoe, but the nesting attempts are highly susceptible to fluctuations in lake level. In low-water years, Forster's Terns will attempt to nest on sandbars in the lake and islands in wetlands. These attempts are probably universally unsuccessful. In high-water years, they nest in wetlands, especially Pope's Marsh and Barton Meadows, on the California side of the Tahoe basin. Foraging birds, however, can be found cruising the entire shoreline of Lake Tahoe.

**Black Tern** *Chlidonias niger*

Black Tern formerly bred in a large colony at Rowland's Marsh, the expansive wetland on the California side of the Lake Tahoe basin that was destroyed with the construction of the Tahoe Keys housing development, and at smaller marshes scattered around the lake during high water years. I know of no documented records for Black Tern in the Carson Range, but there can be no doubt that historically, with as many as 100 pairs in Rowland's Marsh each season (Orr and Moffitt 1971), the species must have visited the wetlands and marshes on the Nevada side of the Tahoe basin.

**Rock Pigeon** *Columba livia*

Rock Pigeons's distribution in the Carson Range is largely restricted to areas of human habitation. The species is most numerous at the casinos of Stateline, but it is interesting to observe the small group that resides at Cave Rock, an environment that is probably inline with their evolutionary ancestry. It is unknown when Rock Pigeons first colonized the Lake Tahoe basin; Orr and Moffitt (1971) make no mention of the species, and a few years later the Lake Tahoe Audubon Society (1978) considers them "rare" in winter and "uncommon" the rest of the year.

**Band-tailed Pigeon** *Patagioenas fasciata*

This species possibly may have increased its numbers in the Tahoe region in recent decades, but it is difficult to ascertain from historic accounts. Orr and Moffitt (1971) describe Band-tailed Pigeons as "stragglers" to the region, with very few prior records, published or otherwise. Thus, it would seem that this species has increased dramatically, as they are now commonly observed in low to middle elevation ( $\leq 2800$  m) forests throughout the Carson Range. Indeed, the species was seen or heard from approximately 11% of all point count stations during 2008. This apparent increase may correspond to the ongoing maturation of the Post-Comstock forest. In the Carson Range, displaying

birds are often seen flying over steep slopes or steep-walled canyons, though the significance of this is unclear. Harsh winter storms may temporarily drive these highly mobile birds to lower elevations, though flocks of Band-tailed Pigeons can be found in the Carson Range year-round.

**Mourning Dove *Zenaida macroura***

Mourning Dove prefers more open habitats than the Band-tailed Pigeon, but it can be found throughout lower elevations of the Carson Range as well. This species likely has increased its numbers in the Carson Range near human habitations, benefiting from supplemental food resources in the form of ornamental plants and bird feeders. Numbers swell slightly in fall, with an influx of post-breeding dispersers and migrants from outside the region, and decrease somewhat from December through mid-April. During the winter, doves that breed in natural areas of the Carson Range must depart for lower elevations or join flocks in urban areas.

**Flammulated Owl *Otus flammeolus***

Very little is known about Carson Range owls, and this species is perhaps the least known of all. Unlike the other owl species at the Carson Range, Flammulated Owls are highly migratory, subsisting primarily on seasonally available invertebrate prey. Despite our lack of knowledge Flammulated Owls are probably fairly common and widespread in the Carson Range. Elsewhere in their range, the species prefers open Jeffrey pine, but is also found in open mixed conifer assemblages and aspen; regardless of the overstory, a dense or shrubby understory is typical of most commonly used vegetation types (McCallum 1994). Such habitats are widespread in the lower and middle elevations of the Carson Range. Spring arrivals are in early May, possibly late April. One would not expect penalties for the species to arrive too early in the high country too early, as the spring storms surely impact the availability of invertebrate prey. Despite this risk, pairs are already at nests in early May in Colorado (McCallum 1994). Flammulated Owls are believed to prefer old Pileated Woodpecker cavities, a fairly rare species in the Carson Range, over those of Northern Flickers and other smaller woodpeckers, but they commonly exploit cavities as small as those from sapsuckers (*Sphyrapicus*, McCallum 1994). I know of no confirmed breeding records from the Carson Range, but a probable nest cavity was found in a pine stump, high in Marlette Creek Canyon, on 26 June 2003. A migratory owl banding project in the Carson Range in the fall of 2001, managed to capture five immatures in five nights of banding between 28 August and 6 September. The species is probably gone from the Tahoe basin by the end of September, but continues to trickle through the lower elevation pine forests, particularly those of the foothills, through early October.

**Western Screech-Owl *Megascops kennicottii***

Orr and Moffitt (1971) make no mention of this species, yet the various checklists for the Tahoe basin describe them as "rare" (LTAS 1978) or "uncommon" (ESIA 1994) year-round. Many anecdotal birder reports suggest that they are at least occasionally found in dense willow thickets of the southern Tahoe basin's meadows and wetland, and they probably occur scattered through similar habitats throughout the lower elevations of the Carson Range. Additionally, USFS surveys have found them in a variety of locations and



habitats around the Lake Tahoe basin (V. Lyon, pers. comm.). Screech-Owls also are likely to be found in riparian deciduous woodlands along the lower elevations of the eastern slope of the range. The species is believed to be completely nonmigratory throughout its range, so Carson Range populations, perhaps on the limits of their range, may be subject to periodic extinctions and recolonizations.

**Great Horned Owl *Bubo virginianus***

This is a common and widespread owl, occurring throughout the Carson Range in open conifer forests and woodlands. Great Horned Owls possess the broadest diet of any North American owl (Marti and Kochert 1996), and are thus able to exploit a tremendously wide variety array of environmental conditions, so long as there are perches available from which to hunt. The species does not migrate and a pair typically stays on its territory year-round. Males begin territorial hooting in the fall, often through the winter. Nesting starts very early in the year; in the Carson Range, egg laying probably takes place in late winter or very early spring, but likely this timing is dictated somewhat by elevation, aspect, and local weather conditions. Great Horned Owls typically use old nests of diurnal raptors, such as Red-tailed Hawks.

**Northern Pygmy-Owl *Glaucidium gnoma***

Due to its frequent habit of foraging during the day, this is the most commonly encountered owl species in the Carson Range. Pygmy-Owls breed in a variety of forest habitats, and they are most common from low to middle elevations. The species is commonly encountered in mature aspen stands. Timing of nesting likely varies with aspect, elevation, and weather, prey availability, etc., but dependent fledges have been found at mid-elevations by 30 June. From late fall through spring, the species is often encountered in riparian areas and willow-lined meadows, hunting birds. Probable elevational movement based on patterns seen elsewhere in the west (Holt and Petersen 2000), and surely those breeding in higher elevations drop down to lake level, or below, but many probably leave the Carson Range altogether. Many stay, however, hunting in willow thickets and frequenting bird feeders.

**Spotted Owl *Strix occidentalis***

A small and scattered population exists on the California side of the Lake Tahoe basin. To date, however, no Spotted Owls have been publicly documented from the Nevada side of the lake. Walters (2004) contended that Spotted Owls occur in the Carson Range, but provided no evidence. The NBRC recognizes no committee-endorsed records for the state, but due to the sensitivity of this species to disturbance, they will not review Spotted Owl reports from the Carson Range. Further, government agencies surveying for the species in Nevada will not reveal their records publicly. Thus, the species appears to at least occasionally reside on the Nevada side of Lake Tahoe, but the details will not be published here. Adjacent to the Nevada state line, Ned Johnson collected two Spotted Owls in the Martis Peak area (1 July 1960), and in 2009 a pair was found nesting above Kings Beach, very near the Nevada state line.

### **Long-eared Owl *Asio otus***

This species appears to have a somewhat split distribution at Tahoe. As an active-search hunter, Long-eared Owls need open terrain to hunt. Thus, they are least common at mid-elevations, where forests dominate. Instead, they are most commonly encountered at the edges of low elevation meadows or wetlands or the wide variety of open habitats of the Carson Range's high elevations. Linsdale (1936) recorded a Long-eared Owl at approximately 2900 m elevation along the crest above Incline Village, 22 May 1934. Their only other requirements are dense cover for roosting, old raptor or magpie nests for nesting, and a safe distance from the nearest Great Horned Owl pair. Little known about the timing of breeding in this species, but it probably varies greatly with weather conditions, elevation, and prey availability. The species is somewhat migratory, and it is doubtful that many, if any, Long-eared Owls stay in the Carson Range through the winter. Additionally, migration possibly may bring additional Long-eared Owls through the Carson Range during the fall; a migratory owl banding project in 2001 netted several during early September.

### **Northern Saw-whet Owl *Aegolius acadicus***

Saw-whet owls breed in a variety of forest types in the Carson Range. They show an apparent preference for conifers, but especially where adjacent to riparian or aspen habitats, preferring dense conifers for roosting and deciduous trees for nesting and foraging. Saw-whets are most common in low to mid-elevations, and fairly rare in the sub-alpine. Very little is known about the timing of breeding in this species in the Carson Range, but independent yet recently fledged immatures have been found elsewhere in the Tahoe basin as early as 13 June (Orr and Mottitt 1971, pers. obs.). Southward migration probably commences in September, and it appears that many birds move through the range during migration; 19 were captured in four nights during the second half of October 2001 (Zach Smith, unpub. data). There is likely some elevational migration during winter (Cannings 1993), perhaps facultative, but this is not well-understood. Eleven roadkilled saw-whets found high on the west slope of the Sierra Nevada at the end of January 1978 (Winter and Manolis 1978), suggests that large numbers probably winter throughout the Carson Range, at least in some years.

### **Common Nighthawk *Chordeiles minor***

Common Nighthawks do not arrive in the Carson Range until early June, but nesting is underway by the end of the end of the month. Nests may be located among pine needles in open woodlands, bare sand, forest clearings such as recently logged or burned areas or timber landings, rocky outcrops, and flat, gravel roofs in urban areas. But nests are never far from trees, and males prefer day roosts along horizontal limbs of trees, typically changing roosts from day to day. At Tahoe, nests have been found up to 2600 m elevation (Orr and Moffitt 1971). Southbound migration begins by late-July, and small to large flocks seen in late summer, apparently just foraging in a group, may be migrating birds. The species is most common through mid-August, smaller numbers through mid-September. As aerial insectivores, foraging is concentrated over meadows, marshes, and ponds, where emergent insects are most concentrated, but they also forage above forest canopy. The species is primarily crepuscular, but occasionally can be observed feeding by day, especially if inclement weather disrupts their normal foraging pattern. Nighttime feeding is rare in this species, regardless of lunar condition.

**Common Poorwill** *Phalaenoptilus nuttallii*

In the Carson Range, poorwills have a much longer annual occurrence than nighthawks. They are fairly common from mid-May through mid- to late September. This nightjar sallies after insects from low perch or ground, most commonly in the twilight hours, but also will hunt through the night when the moon is well-lit. They are commonly found in open woodlands and forest clearings, but especially common on chaparral slopes. Poorwills often are encountered on low-traffic roads in those settings, as roads afford a clear perspective for a low-perching, flycatching bird. Eggs are laid on bare ground, wood chips, pine needles, or leaf litter. Unlike nighthawk nests, poorwill nests typically are partially shaded by a shrub, log, or other vegetation. The species is believed to be double-brooded throughout its range (Holyoak 2001), but this seems unlikely above lower elevations. However, it is entirely possible that the protracted breeding season of this bird allow for two broods in the Carson Range. Additionally, broods can overlap; poorwill pairs in Canada are known to have the male continue to feed the young while the female lays eggs for the second brood (Csada and Brigham 1994).

**Vaux's Swift** *Chaetura vauxi*

In most years, there is a conspicuous pulse of northbound swifts during the month of May. Sometimes migrating flocks can be quite large (ie. hundreds of birds), especially when low clouds or foul weather forces them down into view, but these numbers usually only last a week or so. After the first week of June, most migrants have moved through the area. Southbound birds pass through the area in August and September. Almost all of these birds are seen from lake-level, typically near or on the actual lakeshore, but this is likely a reflection of where people bird during stormy weather.

**Anna's Hummingbird** *Calypte anna*

This species regularly is observed along ridgetops of the Sierra crest during August, but it is far less common in the Carson Range. It is a regular visitor to feeders throughout the region, however, and can be expected to visit feeders in Carson Range neighborhoods from early June through mid-September, occasionally into October (these large, hardy hummingbirds typically are the latest-staying visitors to feeders in the fall). There are no known breeding records for the Carson Range, but it is possible that the species may establish breeding territories around feeders. Males arrive earliest during summer, and may act territorial, but presumably these birds are post-breeding dispersers from lower elevations in California, where breeding may commence as early as March.

**Calliope Hummingbird** *Stellula calliope*

This is the only regularly breeding hummingbird in the Carson Range and the area's most common species from late April until late June, after which hummingbird numbers explode from southbound Rufous Hummingbirds. The species is never common, but may be found nesting throughout the elevational gradient of the Carson Range in open woodlands and forests, wherever there are ample sources of nectar, particularly in riparian areas, meadow edges, and aspen stands. At lower elevations the species may begin nesting in late May, at higher elevations it postpones nesting until later in June. Interestingly, Calliopes seem to disappear by late August, regardless of the nectar supply.

### **Broad-tailed Hummingbird** *Selasphorus platycercus*

This species is regular at feeders just south of the region (e.g. Markleeville), and may breed, at least occasionally, in the Carson Range. During 2002, I observed a female building a nest in a narrow aspen stringer along Logan House Creek. The nest was only 20-25% complete before it was abandoned. A male was seen and heard at bottom of Tunnel Creek Road on 11 May 2002, and vagrants are occasional throughout the Tahoe basin, throughout the summer.

### **Rufous Hummingbird** *Selasphorus rufus*

W. W. Price's contention, as reported by Ray (1903), that this was a breeding species at Lake Tahoe, surely was in error. This is a common misconception due to the fact that the species can be abundant during the summer months, yet all Rufous Hummingbirds seen in the Carson Range are migrants. Spring records for the range are nonexistent, but by mid-June, southbound migrants begin to arrive from their breeding range in the Cascades and Canadian Rockies. In most years, by the end of June Rufous Hummingbirds are fairly common wherever there are blooms, and they become abundant in flower-filled meadows in July. The timing and abundance of this species differ every year, depending on the abundance and persistence of nectaring flowers, but generally numbers start to taper in mid-August and diminish completely by the end of September.

### **Belted Kingfisher** *Ceryle alcyon*

The Belted Kingfisher is an uncommon breeding species in Lake Tahoe basin, nesting in steep eroded banks of stream bends or near the lakeshore. The species is fairly shy and intolerant of disturbance, especially around the nest. Increased housing development and human activity around the lakefront has consequently impacted this species at Tahoe, and they appear to have declined considerably since the 1920s. The Carson Range lacks streams large enough to support kingfishers, but the birds can be found fishing along the Nevada shoreline of Lake Tahoe, I know of no breeding records from the Nevada side of the lake, but with large areas of undeveloped shoreline, one or two breeding pairs are not unlikely. Kingfishers can also be found elsewhere in the Carson, where small fish are available (e.g. Marlette and Spooner lakes, Hobart Reservoir, Lower Prey Meadows, etc.)

### **Lewis's Woodpecker** *Melanerpes lewis*

Contrary to Manley et al.'s (2000) suggestion, this species has not been lost to Tahoe since the Post-Comstock area, but its breeding here has probably always been sporadic at best. For example, it was reported by R. H. Beck as a common breeder around Bijou in the summer of 1896, but during the summers of 1901-2, Ray (1903) never saw a single one. Orr and Moffitt (1971) recognized this pattern, which is typical of the species, although a somewhat more stable population exists in the Truckee area, just to the north of Lake Tahoe. The species can also be found nesting at lower elevations in the eastern foothills of the Carson Range. When breeding, Lewis's Woodpecker is found most reliably in open Jeffrey Pine habitats near or at lake-level (or below, to the east), often on the edges of clearings. An unpublished manuscript by Keeler, as reported by Lindsdale (1936), is quoted as stating that Lewis's Woodpeckers were the "commonest nesting woodpecker" at Glenbrook in 1889. The species remains a fairly regular visitor in the August and September, when small flocks and single birds can be found wandering

through the area.

**Acorn Woodpecker** *Melanerpes formicivorus*

This species is strictly a vagrant to the Carson Range. There is one record from the Zephyr cove area (~25 September 1999), and a highly unusual report from 2003 that does not fit the species' typical vagrancy pattern in terms of timing or location. The bird seen was at approximately 2300 m elevation along the Marlette Lake Trail on 26 June, and was identified as a male. Because of the location and timing, I have always wondered about the possibility that it may have been a male Williamson's Sapsucker. However, the observer was highly experienced, Acorn Woodpeckers were experiencing an "invasion year" in western Nevada that year (even establishing a small, short-lived territory in nearby Verdi), and it would be difficult to misidentify such a distinctive bird at close range.

**Williamson's Sapsucker** *Sphyrapicus thyroideus*

This species prefers mature, open Lodgepole (*Pinus contorta*) and especially Jeffrey pines (*P. jeffreyi*), typical of East Slope forests, but also uses large Red Fir. All of these vegetation types are well represented in the Carson Range, and this species can be relatively common in appropriate habitats throughout. It has been my experience that most of these birds vacate the elevations pertaining to this study by mid-October. However, stragglers can be found, through December at least, working sapwells among the exotic pines planted in low-elevation residential areas. Price (1904), however, felt they were fairly common at Tahoe in winter. Persistence of sapsuckers at these elevations probably corresponds well to temperatures. During a hard freeze, both sap and the invertebrates that it attracts presumably become unavailable.

**Red-naped Sapsucker** *Sphyrapicus nuchalis*

Both pure Red-naped Sapsuckers and Red-naped x Red-breasted Sapsucker hybrids are occasionally seen in Tahoe, particularly during fall or early winter. The eastern slope of the Sierra Nevada is a well-known hybrid zone for the two species, although I know of no documented records of Red-naped Sapsuckers breeding in the Carson Range.

**Red-breasted Sapsucker** *Sphyrapicus ruber*

This species is marginally less common in the Carson Range than the Williamson's Sapsucker, but because of its preference for aspen and riparian communities, this species may be more often encountered. This typically is the most common species of woodpecker in aspen stands. It is also quite common in Lodgepole Pine. Surely experience the same problems with cold temperatures and appears to follow the same seasonal distribution, although this species is more apt to exploit the deciduous plantings around human habitation.

**Downy Woodpecker** *Picoides pubescens*

Manley et al. (2000, Appendix J) considered this species to be new since the Comstock era, likely because Orr and Moffitt (1971) made no reference to the species; however, they had been reported at Tahoe in the literature as early as 1926 (Taylor 1926). They were confirmed as a breeder and considered "uncommon" year round by 1978 (Lake

Tahoe Audubon Society). I suspect this has always been the status of Downy Woodpecker at Lake Tahoe, but the complete lack of older specimens does raise some doubt. This bird is certainly well established now, although it remains considerably less common than other *Picoides* woodpeckers in the Tahoe basin; it was not encountered at any of the 2008 point count stations. Though not thought to be migratory in the traditional sense (Jackson and Ouellet 2002), this species appears to vacate the Tahoe basin during particularly severe winters, presumably retreating to lower elevations. Otherwise, it occasionally joins mixed-species flocks to forage in the non-breeding season. One almost never sees Downy Woodpeckers above near-lake elevation, where they are fond of riparian hardwoods and aspen stands. The species can also be found exploiting ornamental plantings and bird feeders in populated areas. This diminutive woodpecker can exploit much smaller-diameter foraging substrates than its larger cousins, thus they are regularly observed feeding on narrow lateral branches of trees, small willow stems, and even the stems of stout weeds such as Mullein (*Verbascum thapsis*).

**Hairy Woodpecker *Picoides villosus***

Counter to Orr and Moffitt's (1971) assertion, the Hairy Woodpecker is probably the most abundant woodpecker at Lake Tahoe, and this status extends to the Carson Range where the species was encountered at approximately 14% of all 2008 point count stations. The species is widely distributed throughout the range, found in all open forest types, although densities perhaps are greatest at middle elevations. It can be very common in aspen forests. Hairy woodpecker appears to be resident throughout the year, although likely wanders outside of the breeding season, and stormy weather may instigate temporary elevational movements.

**White-headed Woodpecker *Picoides albolarvatus***

In certain vegetation types this can be the most common woodpecker at Tahoe, and greatest densities appear to be where mature Sugar (*P. lambertiana*) and Jeffrey pines come together with other conifer species. The species can be found throughout the year in the Carson Range, though, like the Hairy Woodpecker, may make short elevational movements during times of harsh winter weather. The White-headed Woodpecker seldom is found far from pines, the seeds of which form an important part of their diet, especially from late summer through winter (Garrett et al. 1996). Despite their predilection for pine trees, White-headed Woodpeckers are not generally common in pure lodgepole stands.

**Black-backed Woodpecker *Picoides arcticus***

Black-backed Woodpeckers are common and widespread in the Carson Range, but less commonly encountered below approximately 2500 m elevation. They may be found in all forest types, but are prone to nomadism, concentrating to breed in areas with large numbers of highly stressed or recently killed trees. In certain instances, these areas may be the result of beetle-infestations, but Black-backed Woodpeckers are most famous for moving to into areas of recent forest fires. This species has probably always bred in the Carson Range, but the first nests were not documented until recently (Richardson 2003).

### **Northern Flicker** *Colaptes auratus*

Flickers are most prevalent at lower elevations in the Carson Range, particularly during the nesting season, but may be found in forest edges and open woodlands throughout the entire range. Unlike other woodpeckers, flickers spend a lot of time foraging on the ground (ants are their preferred food), and they require an open or savanna-like habitat structure. Exceptionally, flickers also nest in relatively dense aspen forests. Carson Range birds belong to the Red-shafted (*C. a. cafer* subspecies group). In the fall, especially during October, flicker numbers swell with migrants and can be very common at lake-level. At this time, Yellow-shafted Flickers (*C. a. auratus* subspecies group) and intergrades occasionally are found. Flicker diet shifts largely to plant matter during freezing temperatures, and most flickers vacate to lower elevations; a few winter around populated areas, subsisting on bird feeders and fruit from ornamental plants.

### **Pileated Woodpecker** *Dryocopus pileatus*

Despite its size, this species is quite rare and secretive in the Carson Range, and primarily occurs in shady canyon bottoms, densely wooded with mature, decadent trees. The birds themselves are seldom observed, although I have found the distinctive foraging sign of Pileated Woodpecker in most of the major drainages of the western slope of the range, where they wander in search of their preferred prey, carpenter ants (*Camponotus*). To date, the only known nesting locations in the Carson Range have been near the north Chimney Beach parking lot (Marlette Creek) and in Slaughterhouse Canyon. However, as the post-Comstock forests age and become more decadent, Nevada Pileateds may be found more reliably over a much broader area of the range. For example, in August of 2004 I found a small family group (3-4 birds) foraging in open, south-facing Jeffrey Pine and White Fir, a seemingly atypical habitat. Closer inspection of the trees in the area showed many to be heavily infested with carpenter ants. Pileated Woodpeckers probably are resident year-round in the Carson Range, and they are exceedingly rare on the eastern slope of the range.

### **Olive-sided Flycatcher** *Contopus cooperi*

The largest breeding flycatcher in the Carson Range can often be seen perched on the very tops of tall fir trees. They are fairly common and conspicuous (detected at approximately 20% of 2008 point count stations), but thinly distributed, throughout the forested parts of the range, particularly at middle elevations. These birds tend to stay high in the canopy and require tall, mature trees in which to nest, and from which to forage. Breeding birds return in the last week of May, and most birds leave the area by the end of August. Stragglers or migrants persist through mid-September.

### **Western Wood-Pewee** *Contopus sordidulus*

The Western Wood-Pewee is the most common, most widespread forest flycatcher in the Carson Range, detected at nearly 63% of 2008 point count stations, and occurring from lake-level to the subalpine. The birds occur in all forest types, but prefer stands that are relatively open, such as mature aspen stands. Pewees begin to arrive on territories in the Carson Range after the first week of May, but late spring storms regularly force large numbers to temporarily retreat to lower elevations. Western Wood-Pewees vacate the

Carson Range by the end of September.

**Willow Flycatcher *Empidonax traillii***

This species was probably a former breeder in wet meadows with slow-moving or ponded water. The species has experienced fairly dramatic declines throughout the Sierra Nevada, being fairly common earlier in the last century. On the California side of the Tahoe basin, Ray (1913b) describes finding six nests along Trout Creek over the course of two days in 1910. Lindsale (1936) cites a specimen from Glenbrook (30 May 1889), and there is no reason to doubt that the species was formerly a common component of moist meadows throughout the Carson Range. Currently, the species is restricted to a few pair scattered around wet meadows in the south and west basin, but seemingly appropriate habitat does exist in places like Lower Prey Meadows. Whatever the cause of the declines, Willow Flycatchers have not bred in the Carson Range for decades. Juveniles with buffy wingbars occasionally can be seen in fall migration away from territories, often at lakeshore birding spots (August through mid-September).

**Hammond's Flycatcher *Empidonax hammondii***

Hammond's Flycatcher is an uncommon migrant through the Carson Range, but can be found breeding on the west side of the Tahoe basin (where habitat preferences remain unclear). Most Hammond's Flycatchers in the Carson are observed in May and early June; a few dispersers and migrants are again seen in August and September. Because of their similarity with Dusky Flycatcher, this species may be overlooked in the Carson Range. Johnson (1975) lists Hammond's Flycatcher as breeding in the Carson, but provides no details. This status may reflect the several Hammond's Flycatchers that Johnson collected in the Martis Peak area (California) in July 1960 and June 1961.

**Gray Flycatcher *Empidonax wrightii***

This is always the first *Empidonax* to be seen in the spring migration, moving through area in late April through mid-May. A few fall migrants can be found in seemingly appropriate high-elevation shrubby habitat, such as in the Mount Rose area, in September. Not believed to breed in the Carson Range, Gray Flycatchers do breed at lower elevations in the region, and possibly may breed within the elevational limits of this study, on the eastern slopes of the Carson Range, in shrubby Great Basin vegetation.

**Dusky Flycatcher *Empidonax oberholseri***

Dusky Flycatcher is the most common and widespread *Empidonax* in the Carson Range, rivaling Western Wood-Pewee for numerical flycatcher dominance, and likely the only current breeding species of its genus. This species surpasses Western Wood-Pewee in ubiquity and can be found in a great variety of habitats, wherever shrubby vegetation can be found: open forests with shrubby understories, regenerating aspen stands, treeless chaparral of all kinds, willow-dotted meadows, and forest clearings. Dusky Flycatchers are present in the Carson Range from late April through September.



**Pacific-slope Flycatcher** *Empidonax difficilis*

**Cordilleran Flycatcher** *Empidonax occidentalis*

Both of these species have been positively identified by vocalizations in aspen stands in the Carson Range, which represents the southern limit of a narrow section of potential overlap between the ranges of these two recently split species (formerly "Western Flycatcher," *E. difficilis*). While these birds occurred during summer, there has thus far been no evidence of territoriality in any of these birds, as individuals never persist at the same locality for more than a day or two. That said, territorial Pacific-slope Flycatchers have been found east of the Sierra Crest on consecutive years in an aspen stand adjacent to Perrazzo Meadows, north of Truckee, and are more regularly found on the west side of the Tahoe basin, so Pacific-slope Flycatchers may attempt to breed in the Carson Range on occasion. Johnson (1975) lists Western Flycatcher as breeding in the Carson, but provides no details; in a later work (Johnson 1980), he stated simply that sight records "are available, however, from a few sites scattered on the east side of the northern Sierra Nevada, between Cottonwood Creek, Sierra County, California, and Hunter Creek, Carson Range, Washoe County, Nevada." Johnson (1980) further remarked on his apparent surprise that in aspen or in mixed aspen-conifer forests within a broad region that includes the Carson Range, Dusky Flycatchers were always present in habitats that seemed ideal for Western Flycatcher further north. Most records of Cordilleran Flycatcher are from July and may represent wandering, non-breeding dispersers. A portion of the silent birds passing through the Carson Range in August may pertain to this species, but are more likely Pacific-slope Flycatchers.

**Black Phoebe** *Sayornis nigricans*

This species does not breed in the Carson Range, but dispersing juveniles regularly pass through, typically staging in riparian areas at lake-level. Numbers peak through August, and occasionally, hearty individuals will attempt to spend the winter and set up fall territories. These birds typically get forced downhill after the first big winter storm, but occasionally persist long enough to be tallied during the annual Christmas Bird Count "count week."

**Say's Phoebe** *Sayornis saya*

This highly migratory flycatcher does not breed in the Carson Range, but early spring migrants often turn up along Lake Tahoe's shore during March, which always seems surprisingly early for this latitude. Fall migrants are fewer, but can be found along the shoreline or in low-elevation meadows during September

**Western Kingbird** *Tyrannus verticalis*

This large flycatcher breeds in the agricultural areas to the east of the Carson Range, and upslope dispersal brings wandering kingbirds into the area in late summer (late July through mid-September). Almost invariably, kingbirds are found in open fields and meadows near lake-level, such as Rabe Meadows and Glenbrook. A small number of migrants stopover briefly in May, as well.

**Plumbeous Vireo** *Vireo plumbeus*

**Cassin's Vireo** *Vireo cassinii*

These species are notoriously difficult to distinguish from each other. I had scrutinized hundreds of "Solitary Vireos" (both species were considered *V. solitarius* prior to the AOU split in 1997) in the Carson Range, before I was finally convinced of seeing a Plumbeous Vireo (two individuals seen high on Tunnel Creek on 15 August 2005). Most contenders have been in August and September, when Cassin's can be quite worn, but also when vireos from elsewhere in the Great Basin may be dispersing through the area. The first observation from the Carson Range during the breeding season was a singing male along North Canyon Road, 15 June 2007. In recent years there have been reports of breeding from aspen along nearby Leviathan Mine Road and Mountaineer Creek in Alpine County, CA (Steve Hampton, pers. comm.). Thus, it appears that this species may be increasing, both locally and regionally. During the 2008 point counts, two counter-singing males were observed on 8 June, including one that paired with a female Cassin's. Hybrids between the two species are not previously known. This pair built a nest, which was located the following day (9 June). The pair was observed delivering food to this nest on 4 July. Whether this nest was successful is unknown; both adults were observed on territory on 14 July, with the male continuing to sing on this date. Fledged young were not observed, although it is possible that young fledged and dispersed between 4 and 14 July. The systematics of these species are quite an interesting story, and worth discussion. Ned K. Johnson, whose work with allozyme variation in the *V. solitarius* complex (Johnson 1995) led to the species being split (AOU 1997), found that Cassin's and the eastern Blue-headed Vireo (formerly *V. s. solitarius*) were more closely aligned to one another than either were to Plumbeous, which suggests little if any gene flow. Thus, it is perhaps not surprising there had been no prior known hybridization reported for Plumbeous and the other two species (Curson and Goguen 1998); this lack of reported hybridization also may be due, perhaps, to the fairly recent nature of the species split. However, Johnson (1995) asserted that Plumbeous Vireo had been expanding westward and was continuing to do so, an assertion supported by the findings presented here. It appears that the areas of sympatry between Plumbeous and Cassin's also are expanding, and I suspect that we can expect a more complicated situation (with likely hybridization) in the Carson Range, in the decades to come. For the purposes of analysis, all observations were lumped back into the superspecies "Solitary Vireo." Solitary Vireos in the Carson Range typically are found in riparian settings, but this is not a strict requirement, and they often settle for watercourses that become dry shortly after all of the snow has melted. They are especially fond of lodgepole pine and aspen, and typically nest in one of those two species. Solitary Vireo is far less common than Warbling Vireo in the Carson Range, but proportionately more likely to be found in coniferous riparian contexts. Cassin's Vireo have been recorded in the Carson Range from May through September, Plumbeous from June through August.

**Warbling Vireo** *Vireo gilvus*

Warbling Vireo is a very common, conspicuous species in the Carson Range (detected from nearly 43% of 2008 point count stations), though it is largely restricted to deciduous trees (*Populus* and *Salix*) and lodgepole pine, often in riparian or meadow-edge contexts. It is most commonly associated with *Populus*, aspen in particular, and breeding densities

in mature aspen stands can be quite high. For example, for the 81 point count stations where Warbling Vireos were detected within 50 meters, an average of 2.7 vireos were tallied (within 50 meters). In contrast, Dusky Flycatcher was almost identically abundant when summed across all stations, yet averaged only 1.7 detections within 50 meters. The earliest Warbling Vireos may arrive at lower elevations in the Carson Range in late April, depending upon the weather, and most will leave the area by the end of August. Stragglers and migrants persist through mid-September.

**Steller's Jay** *Cyanocitta stelleri*

Steller's Jays are common year-round residents in coniferous and coniferous-deciduous forests and woodlands of the lower to middle elevations of the Carson Range, and can be abundant around populated areas. Conspicuous and widespread, Steller's Jays were detected from 54% of 2008 point count stations. The species is resident year-round, although birds of the highest elevations may retreat to lower elevations during prolonged periods of stormy winter weather. At lake-level, the species initiates nesting early in most years, typically in early May.

**Blue Jay** *Cyanocitta cristata*

This species is strictly a vagrant in the Carson Range. Nevada's first record for this species came from two individuals that were feeding on scraps and handouts at what is now the Diamond Peak Ski area. This pair was present 2-4 March 1978 (Kingery 1978b). A few years later, a cooperative bird spent the winter coming to a feeder in South Lake, on the California side of the Tahoe basin, present from at least 17 Dec 1983 through March of 1984 (CBRC #185-1984-10). Thus, there appears to be some pattern of winter vagrancy that may bring wandering Blue Jays back to the area in the future.

**Western Scrub-Jay** *Aphelocoma californica*

Scrub-Jays are regular spring and fall transients to the Lake Tahoe basin, typically occurring as singles or pairs and moving through the area without lingering. They are most often encountered along the lakeshore, although they have also been seen at such upland locales as the Bliss Creek pond and Spooner Lake, or in small flocks exploiting late summer grasshoppers in Little Valley. Additionally, scrub-jays breed in chaparral along the Carson Range's eastern slope, and a few breeding pair may reach the lower elevational threshold of this study. Almost all Carson Range scrub-jays belong to the *A. c. superciliosa* subspecies, which breeds in the Reno and Carson areas, as well as on the west slope of the Sierra Nevada. Woodhouse's Jay (*A. californica woodhousei*) occasionally wanders into the area as well, although I know of no certain records. Ray reported seeing a Woodhouse's Jay on the east side of Spooner Summit during a summer trip, but his description casts doubt on the identification. His description, paired with the location and timing of the record, suggests that it was probably *A. c. superciliosa*.

**Pinyon Jay** *Gymnorhinus cyanocephalus*

This nomadic species may be encountered at any time of year in the Carson Range, and breeds sporadically in small pockets in the eastern and northeastern foothills. Within the Tahoe basin, they are found most typically in fall as small wandering groups around the southern half of the Lake Tahoe, but occasionally elsewhere on the west slope of the

Carson Range. Single birds sometimes are encountered, as well.

**Clark's Nutcracker** *Nucifraga columbiana*

The relationship between Clark's Nutcracker and whitebark pine (*Pinus albicaulis*) is inextricably linked (Tomback 1998, and references therein), and the bird's diet consists almost exclusively on pine seeds, which it caches in order to subsist on through the year. Despite its close ties to subalpine pines, Clark's Nutcracker can turn up anywhere from treeline, where they are most typically observed, down to lake-level and below. They are far less frequently observed at low elevations from April through June, when they are engaged in nesting. From June through mid-August, noisy family groups and multi-family flocks often descend into mid-elevation forests, where, among other activities, they depredate the nests of other birds. By late summer and early fall, new pinecones are ripening and nutcrackers once again concentrate on extracting the seeds of whitebark pine. Caching generally begins in September.

**Black-billed Magpie** *Pica pica*

Magpies are common in open riparian areas and wet meadows in the lower elevations of the eastern slope of the Carson Range, rarely venturing up into the elevational range considered in this study. They have also been observed feeding on grasshoppers in Little Valley in late August. At Lake Tahoe, they currently are found breeding only in the vicinity of the Upper Truckee Marsh and East Cove restoration area, in California. It is unknown if this population shares any gene flow with the Gardnerville population, but such short-distance movements over Kingsbury Grade seem reasonable for this species. However, within the Tahoe basin I know of no substantiated modern records away from the Upper Truckee Marsh and its adjacent meadows. Historically, magpies were more widespread on the Tahoe side of the range, with records from Glenbrook (Linsdale 1936), for example. Juveniles, with their fleshy faces and often straw-colored bills, are easily mistaken for Yellow-billed Magpies (*Pica nuttalli*), but there are no valid records of Yellow-billed Magpies of the Sierra crest.

**American Crow** *Corvus brachyrhynchos*

Crows are largely absent from the Carson Range in summer, although there are scattered records. Crows are most commonly encountered around southern Lake Tahoe's urban areas and meadows in spring and fall. While at Tahoe, they often are seen getting harassed by ravens which have effectively displaced crows in the Carson Range. Prior to the 1970s, crows were the principal large corvid seen at Tahoe, although they were probably always transient (Orr and Moffitt 1971, Lake Tahoe Audubon Society 1978).

**Common Raven** *Corvus corax*

The relatively recent colonization of Lake Tahoe and the Carson Range by ravens is an interesting story and can be qualitatively charted by looking at the literature. It is almost inconceivable that such a conspicuous creature could go undetected were the species resident, so the fact that they were not described prior to the mid-1970s suggests that they were historically absent from Lake Tahoe and the Carson Range. Orr and Moffitt (1971) make no mention of the species whatsoever, and Wally Sumner recorded but one during his three years of residence in Tahoe in the mid-1970s, a single bird flying around the

summit of Ralston Peak (California), 19 July 1975. As of 1978 they were still considered "casual" and only in the summer ("not recorded every year," Lake Tahoe Audubon Society 1978), and the species was not recorded on the South Lake Christmas Bird Count until 1990. By 1994 they had established themselves as year-round residents and breeders, but were still considered "uncommon" (Eastern Sierra Interpretive Association). As of this writing, I cannot imagine going a day in the Carson Range without seeing one, particularly around populated areas. By contrast, the 2009 Christmas Bird Count, a portion of which extends from Stateline to Cave Rock, recorded 76 ravens.

**Horned Lark** *Eremophila alpestris*

Small numbers of Horned Lark have been known to breed along the highest, barest ridges around the Lake Tahoe basin. I know of no documented breeding records from the Carson Range, but likely habitat can be found in the Mount Rose/Houghton/Relay Peak area and perhaps Snow Valley Peak within Nevada, and the Job's/Job's Sister/Freel area in California. From fall through spring, sporadic flocks of Horned Larks can be found at lake-level meadows, fields, and dried wetlands, and along the shoreline of Lake Tahoe.

**Tree Swallow** *Tachycineta bicolor*

Tree Swallows are widespread, but semicolonial, nesters of the lowest elevations around Lake Tahoe, often nesting in holes in pier pilings or in cavities in trees and stumps right at the water's edge. Ray (1905) described this nesting habit, and it is compelling to consider that this species has been exploiting piers as nesting substrate at Lake Tahoe for over 100 years. While short-distance and facultative migrants may return to the Carson Range during extended periods of fair winter weather, Tree Swallows are the first truly migrant summer resident to return to Lake Tahoe, the first of which typically arrive by late February. That an aerial insectivore bird would choose to suffer through the winter's remaining storms, is curious indeed, but may speak to the selective advantages of securing the best nest cavities early and attempting to rear multiple broods. Also curious, much seemingly appropriate habitat goes unoccupied. Numbers peak in through August, but the species is entirely gone by the end of the month.

**Violet-green Swallow** *Tachycineta thalassina*

Violet-green Swallows nest colonially in cliffside crevices or, as is more typical elsewhere along the eastern slope of the Sierra Nevada, in tree cavities. Both of these substrates appear to be in good supply in the Carson Range, and a few Violet-Green Swallows may be seen in the Carson Range during the breeding season, yet I know of no documented breeding records for this species in the Carson, nor for the Lake Tahoe basin as a whole. Nonetheless, occasional breeding may go undetected. A few immature Violet-greens, were seen in Lower Prey Meadows 10 July 2007, which on the early side for immature birds in the Carson Range and may indicate possible breeding that year. Migrants typically pass through in April and again in August, when they can be a common component of the mixed swallow flocks at Lake Tahoe. Migrants continue to trickle through the next two months, and in some years there is a conspicuous final pulse through the Sierra Nevada in the last two weeks of October, generally associated with storms and or south winds.

**Northern Rough-winged Swallow** *Stelgidopteryx serripennis*

Small numbers of this species can be seen as migrant around Lake Tahoe's shores, and especially over the open meadows and wetlands at the southern end of the Tahoe basin. Small numbers occur during late April and early May, and then they are more common, and form larger flocks, during August. I know of no records of breeding by this species in the Carson Range. However, during low-water years, the species has been recorded nesting in the banks of the canal of the Upper Truckee River, on the California side of the Tahoe basin, but may nest annually at other, less vulnerable locations, including sites in the Carson Range.

**Bank Swallow** *Riparia riparia*

A few scattered migrants and transients have been recorded along Tahoe's shores in spring, summer, and especially fall. The nearest colony that I know of is at the very base of the Carson Range foothills, in a sandbank used by the Nevada Department of Transportation (NDOT) for material, at the bottom of Highway 50, near where it joins Highway 395. This colony is sensitive to disturbance and only active in years when NDOT is not actively disturbing the substrate (possibly in violation with the Migratory Bird Treaty Act of 1918). This is unfortunate, as the species has experienced considerable declines in the western part of its range (Humphrey and Garrison 1987) and has been listed as Threatened in California since 1989.

**Cliff Swallow** *Petrochelidon pyrrhonota*

Craigmile (1906) described colonial nests by the hundreds along the high banks of the Lake Tahoe. These sites have now been replaced by eaves of boathouses and other buildings with open, undisturbed access, most typically near lake-level. Natural nesting locations can still be found at Tahoe, however. Such colonies occur among high, steep andesite formations along the basin's southwest crest and possibly may occur in the Carson Range as well. Around the buildings and other structures that the species has adopted as its preferred substrate, Cliff Swallows can be abundant, and small flocks on foraging forays occasionally may be observed far from nests. They are present in the Carson Range from mid-April through September, with peak numbers from mid-July through mid-August. Though Cliff Swallows always occurred in the Carson Range in large numbers, increases in available nesting substrates have almost certainly made them more abundant now than before European settlement.

**Barn Swallow** *Hirundo rustica*

Barn Swallows are slightly less colonial than Cliff Swallows, though they do aggregate where nesting substrates are ideal. Historically, North American Barn Swallows are believed to have nested in caves, grottos, and possibly hollow trees, eschewing the exposed cliffs used by Cliff Swallows (Brown and Brown 1999). Elsewhere in North America, Barn Swallows were nesting on Native American structures in the early 1800s (Macoun and Macoun 1909), but structures used by the Washoe Indians in the Carson Range would not have fulfilled the Barn Swallow's requirements of a wall with a strong overhang. Thus, nesting habitat was quite limited in the Carson Range prior to European settlement. Now the species is extremely abundant. It may have been more widespread in the Carson Range during the early European settlement of the area, when barns and

other outbuildings were scattered across the landscape. Now the species is found principally around the lakeshore, finding suitable nesting locations among the countless piers and boathouses. Weather dictates the earliest and latest records in a given year, which can span from mid-March through mid-October, but the peak period of Barn Swallow presence in the Carson Range is from mid-April through mid-September.

### **Mountain Chickadee *Poecile gambeli***

The chickadee is the most abundant and widespread resident species in the Carson Range, common in forests and woodlands from lake level (and well below, to the east) to treeline. Chickadees were detected from an impressive 86% of all 2008 point count stations. As a resident and a cavity-nester, this species might be expected to get a considerable head start on breeding. Indeed, they start singing as early as March on calm, sunny days, a behavior that begins to establish territorial boundaries and reinforce pair bonds, yet nesting typically does not start until mid-May, even later at high elevations. Singing is most common in close proximity to nests, peaks during the egg-laying period, and ends abruptly when the female has finished incubating and brooding the nest (McCallum et al. 1999). By the end of August, individual territories have broken down, and the birds form larger foraging flocks, often in association with other species, composed of neighboring family groups. These larger flocks are the principal social unit for the species, persist through the winter, and establish winter territories that may be defended against other groups of chickadees (McCallum et al. 1999). Note that the white supercilium of Mountain Chickadees can be reduced or even absent in worn individuals, a phenomenon seen in late summer, leading to possible confusion with Black-capped Chickadee (see Hypothetical).

### **Bushtit *Psaltriparus minimus***

Bushtits are common residents of chaparral and shrubby riparian habitats of the Carson Range's lower elevations (< 2200 m). This species has long been suspected of breeding species on the west slope of the Carson Range where extensive chaparral can be found (e.g. Tunnel Creek Canyon), and is a known breeder from chaparral on the east slope (although the species was missed by Kelleher (1970)). Linsdale (1936) reported the species as occurring from Incline Village, but made no details regarding season or breeding status. Attempted breeding was confirmed on 27 May 2008, when a female was observed carrying nesting material past during a point count. Unfortunately, because I was in the middle of a timed survey, I was unable to follow the female to find the nest. The resident Carson Range birds appear to be the gray-crowned *P. m. plumbeus* subspecies, but careful observers have noted flocks on several occasions that have the odd brown-crowned *P. m. californicus*-type bird in their midst. Seemingly pure flocks of *P. m. californicus* have been observed elsewhere in the Tahoe basin in the fall, as well. It is possible that this is an area of intergradation between these two subspecies types, or that some of the "brown-crowned" genes are still circulating in the reserves of this population, and are occasionally expressed. Grinnell et al. (1930) discuss possible interbreeding between *plumbeus* and *californicus* in a similar zone near Lassen Peak, California, and Gaines (1988) suggests that both races mix on the east slope in the fall and winter, in Mono County, California. During late fall and early winter flocks of Bushtits are most likely to be encountered away from chaparral, and appear more closely

ried to *Salix* at this time. Mid-winter records from the Tahoe basin are rare, and are restricted to lake-level. Post breeding flocks can be quite large, such as a flock of approximately 80 Bushtits found in the chaparral above Memorial Point, 31 August 2009.

**Red-breasted Nuthatch** *Sitta canadensis*

Red-breasted Nuthatch is the most common and widespread of Carson's nuthatches (detected from 47% of 2008 point count stations). In the breeding season, this species is less common in the open Jeffrey pine common on the eastern slope of the Sierra, but prefers instead denser, shadier stands of coniferous trees, particularly red fir. White fir, however, is a suitable substitute, and as white fir has becoming increasingly thick throughout much of the Carson Range, the Red-breasted Nuthatch likely has increased in number and extent. Dense stands of lodgepole pine, however, are not favored. Seasonal movements in this species are unclear, as some populations, in some years, can be highly migratory. Red-breasted Nuthatches appear to make some elevational adjustments to weather, perhaps vacating the highest elevations, but they can regularly be found at lake-level throughout the winter, often in mixed feeding flocks with chickadees and other nuthatches.

**White-breasted Nuthatch** *Sitta carolinensis*

White-breasted Nuthatch is far less common than Red-breasted Nuthatch, but it is nearly as widespread, and occupies a broader range of forest and woodland types, though usually open and with comprising trees with large trunks. In the Carson Range, this species favors open pine, aspen, and even timberline habitats. Many Carson Range White-breasted Nuthatches shift to lower elevations during the winter, and may be relatively common near lake-level during those months, often mixing with chickadees and other nuthatches.

**Pygmy Nuthatch** *Sitta pygmaea*

Pygmy Nuthatches are the most social of the nuthatches, almost always seen in noisy groups. They are almost exclusively found among "yellow pines" (*Pinus ponderosa*, *P. jefferyi*, and *P. washoensis*), although other pines are visited at times. Pygmy Nuthatches also nest in aspen, especially where ample pines are nearby. Due to the comparatively low elevational position of this species' favored habitat ( $\leq 2500$  m), seasonal movements in this species are probably minimal except in the severest of winters.

**Brown Creeper** *Certhia Americana*

Brown Creepers are common residents throughout forested communities of the Carson Range, though more common in dense coniferous vegetation types. Their principal requirement is the presence of decadent trees with sloughing bark, behind which they hide their nests. No seasonal movement is known, although creepers sometimes join mixed chickadee-nuthatch flocks for foraging.

**Rock Wren** *Salpinctes obsoletus*

Rock Wren is an uncommon breeder in the Carson Range, principally on high rocky peaks, talus slopes, and rocky ridgelines, but also at a few lower elevation cliffs and roadcuts. Precise seasonal distribution is unclear, but spring migrants probably settle on



to territories in May, possibly earlier. By the end of September, Rock Wrens have migrated out of the Carson Range for lower elevations, probably fanning out into the Great Basin.

**Canyon Wren** *Catherpes mexicanus*

This species may breed in the western Tahoe basin, and formerly may have been a regular breeder in the Carson Range, but currently is not believed to be. Ray (1910b) described a nest with young found at Cave Rock, 30 May 1909. Nesting in the Carson Range has not been documented there since, despite considerable effort by many researchers over the last century. The species occasionally does wander through the Carson Range, and single individuals are most often detected during summer at low-elevation cliffs on the west slope of the range. Sporadic, undetected breeding possibly may occur, but failure to find evidence suggests that the Canyon Wren is not a regular component of the Carson Range's breeding avifauna.

**Bewick's Wren** *Thryomanes bewickii*

Bewick's Wren is a post-breeding disperser and migrant through the Carson Range, with small numbers passing through riparian areas and meadow-edge and lakeshore willows during a protracted period from July through September. Occasional stragglers may be found later into the fall.

**House Wren** *Troglodytes aedon*

House Wrens are small but highly vocal, making them quite conspicuous where they occur. They occur over a variety of forest and woodland vegetation types, primarily in the lower to middle elevations, but seem to require deciduous trees. House Wrens can be highly abundant in mature aspen stands, where they benefit from an ample supply of cavities for nesting. Date ranges span from mid-April through mid-October, but the core of House Wren presence is mid-May through mid-September.

**Winter Wren** *Troglodytes troglodytes*

This species was listed as a suspected breeder in the Carson Range in the Nevada Breeding Bird Atlas (Floyd et al. 2007), but in our considerable experience, the species was only rarely encountered in the Carson Range. The preferred habitat for this species is quite scarce in the Carson Range, but it does exist in small pockets. The comprehensive nature of our sampling design compelled us to explore the extremely densely vegetated, steep, steep-walled, shady canyons that this species prefers, and much to our surprise, singing Winter Wrens consistently were recorded where appropriate habitat was encountered. The pockets of appropriate habitat are so scarce that typically, only one singing male was found per drainage. However, three nearly adjacent territories were found along Bonplant Creek on 3 June 2008. In 2009, surveys in similar habitat on the California side of the Tahoe basin revealed consistent presence of Winter Wrens as well. While still not confirmed, the discovery of so many territorial males is highly suggestive of breeding in the Carson Range. Singing birds have been found along Incline, Secret Harbor, Bonplant, and Marlette creeks. Winter records are lacking for the Carson Range, but some of the breeding population may stay through the season. This

species has been found in riparian thickets in early April, with deep snow still blanketing the landscape.

**Marsh Wren** *Cistothorus palustris*

Marsh Wren is a former breeder in the wetlands of the southern Lake Tahoe basin. By the 1990s, and likely for the decades following the construction of the Tahoe Keys, it had been extirpated as a breeder, and only seen as a post-breeding disperser and fall migrant. In the late 2000s the species made a gradual comeback, occurring earlier and earlier during each successive summer. In July 2009, the discovery of adults feeding recently fledged downy young confirmed breeding. Recent increases in cattails (*Typha*) and tule (*Schoenoplectus acutus*) around the Tahoe basin may encourage a return of this species. Small pockets of appropriate habitat exist in wetlands and ponds, and appear to be increasing, throughout the lower elevations of the Carson Range.

**Golden-crowned Kinglet** *Regulus satrapa*

The Golden-crowned Kinglet can be found anywhere there is white fir, but they are especially fond of red fir and lodgepole pine. The species is easily overlooked, as they are small, generally stick to the treetops, and possess a high-pitched voice beyond the range of many ears. However, the species is widespread and quite common. During winter months, foraging flocks form, regularly descending to lake-level on the west slope and even lower elevations on the east slope.

**Ruby-crowned Kinglet** *Regulus calendula*

The Ruby-crowned Kinglet was formerly much more common as a breeder in the Carson and Range and Lake Tahoe. Nesting has been described from Incline (Linsdale 1936), and the species was found at Marlette Lake by Ray (1910a), who found many nests from elsewhere in the Lake Tahoe basin, typically in fir or lodgepole pine (Ray 1912, 1913a, 1918). Orr and Moffitt (1971) described their song "one of the most characteristic sounds in the Transition and Canadian zone forests about Lake Tahoe." Such is no longer the case, and though the Ruby-crowned Kinglets can still be found annually, there is little evidence of regular breeding in the Carson Range in recent decades. The cause of this decline is unknown. From mid-September through early December and again from mid-March through mid-April, the species is much more commonly encountered as a migrant, most often in willows and alders.

**Blue-gray Gnatcatcher** *Polioptila caerulea*

This species is not believed to breed in the Lake Tahoe basin, although numerous summer records exist. These may simply represent transients, although suitable habitat occurs, particularly in the Tunnel Creek drainage, where riparian and chaparral vegetation types coexist. On the east slope of the Carson Range, gnatcatchers breed in chaparral and adjacent riparian vegetation, most of which lies below the lower elevational threshold of this study. Migrants are most commonly encountered in the first half of September.

### **Western Bluebird** *Sialia mexicana*

This uncommon breeder has a somewhat enigmatic distribution in the Carson Range, but may be found, at least occasionally, in smaller grassy meadows, forest clearings, and edge habitats throughout the range. Though it occurs at lake-level, it is more common in the middle and upper elevations, and can be founding nesting surprisingly deep into forests, where it uses old woodpecker cavities. It is most consistently found in areas of recent forest fires, often co-occurring with Mountain Bluebirds. Ray (1905) described a nest found in a pine stump near Edgewood. From September through early December, small flocks of Western Bluebirds are commonly heard overhead at lake-level meadows and along the shoreline. They are also encountered in large flocks, often of both bluebird species, migrating along the high ridges during late September, October, and even November. From late summer through early winter, bluebird blocks may be seen descending on juniper trees (*Juniperus*) or mistletoe-infested conifers, in search of berries. The first spring arrivals can be seen in the last days of March.

### **Mountain Bluebird** *Sialia currucoides*

The Mountain Bluebird prefers more open habitats than Western Bluebirds, and is therefore a more widespread breeder in the Carson Range: found from lake-level wetlands to sub-alpine woodlands. Despite its range of habitats, and the fact that it is more commonly encountered than Western Bluebird, Mountain Bluebird is not a common bird in the Carson Range. Though both species will use nest-boxes, Mountain Bluebirds are more prone to use unconventional nesting substrates: pier pilings, chairlift towers, Cliff Swallow nests, crevices in buildings and cliffs, etc. Though Mountain Bluebirds prefer more open expanses than Western Bluebirds, it also is commonly encountered in recent forest fires. Migration patterns through the Carson Range are similar to those of Western Bluebird, though less concentrated, and first spring arrivals can show up in early March.

### **Townsend's Solitaire** *Myadestes townsendi*

This species is fairly common and widespread in open coniferous habitats throughout the range, but especially from middle elevations through treeline. In winter, many individuals descend into residential areas to exploit the berries of ornamental plants. Many others fan out into the Great Basin in search of juniper berries. Birds whose territories include berry-producing plants will often defend winter territories, and the species can occasionally be heard to sing in the middle of winter. This is most commonly seen along Carson Range ridgetops with junipers, and defense of these resources can be especially fierce in the fall, when flocks of robins, bluebirds, and finches patrol through in larger numbers.

### **Swainson's Thrush** *Catharus ustulatus*

The Swainson's Thrush has become alarmingly rare throughout the Sierra Nevada. They have become extirpated from many locations where they were formerly regularly breeding summer residents, such as Yosemite Valley (Gaines 1988) and Whitaker's Forest (Marshall 1988), and we know of almost no current or recent evidence for breeding from the region (Small 1998). In 2009, a small concentration of territorial Swainson's Thrushes was found in Ward Canyon, on the California side of the Tahoe

basin. Several pairs and two old nests were found, the first evidence of nesting in Tahoe in many decades. As elsewhere in the Sierra, they were once considered "fairly common" breeders at Lake Tahoe (Orr and Moffitt 1971), and Linsdale (1936) reported this thrush as being common around their camp at Incline in June 1931. James Moffitt collected a male near Incline in June 1936 (CAS #42428). They are now extremely rare in the Lake Tahoe basin, and prior to 2007, I had never observed the species in the Carson Range. Thus it was with great surprise to find a singing male in shady riparian aspen in Slaughterhouse Canyon on 10 July of that year. This bird had not been present in many prior visits during that year. The following year, I found a territorial male, singing incessantly from the treetops, in a mature aspen stand along Galena Creek, on 9 July 2008. Encouraging as this observation was, it is unknown (but highly unlikely) whether the bird had a mate. Typical of recent records from the Tahoe basin, the aspen stand was bounded by patchy, wet meadow.

#### **Hermit Thrush *Catharus guttatus***

Hermit Thrushes are fairly common in heavily wooded forests throughout the Carson Range, particularly those with a healthy complement of young, well-spaced fir trees, their favored nesting substrate. The species will use other substrates as well, including many species of conifers, as well as *Populus* and other hardwoods. Migrant breeders begin to show up in the last days of April and are common by mid-May. Most have left the region by the first week of September. A steady stream of migrants and dispersing birds continues to trickle through until heavy snowfalls drive the hardiest of would-be wintering birds to lower elevations. Local birds belong to the *C. g. sequoiensis* subspecies, but specimens of migrants have been assigned to the *C. guttatus guttatus* subspecies from the western Canadian Rockies (Orr and Moffitt 1971). It is likely that other subspecies occur as well.

#### **American Robin *Turdus migratorius***

This species is common, widespread, and conspicuous, detected from 51% of 2008 point count stations. Robins are found nesting in a wide variety of habitat types, particularly in the lower elevations, and is abundant in aspen forests, meadow edges, and riparian areas. Robins nest in open conifer forests as well, but it is seldom far from moisture, as it requires mud in the lining of its nest. The seasonal distribution of this species is largely tied to the weather, and it can be considered a facultative migrant. Large flocks may enter the region during fall, and many birds will attempt to winter in the Carson Range during milder years. Colder years with frequent or heavy storms, however, will be completely devoid of wintering robins, although small flocks will return to the mountains during periods of warm weather. Thus, at lake-level, American Robins are in place and on territory by the end of April, and fully-fledged young may be seen in late May. At higher elevations, robins commence nesting in June, and have been observed incubating eggs with several centimeters of snow on their backs.

#### **Varied Thrush *Ixoreus naevius***

Varied Thrush is a passage migrant, mostly encountered in the fall, but occasionally during spring as well. The species is probably far more common than records indicate, as they are usually discovered well away from Lake Tahoe's shoreline birding hot-spots.

Fall migrants are most commonly found in coniferous forests, often in pairs or small groups of 3-5, from October through December. Spring migrants are from mid-March through April, and occasionally can be heard singing by the end of April.

**European Starling** *Sturnus vulgaris*

In the Carson Range, starlings are uncommon residents around populated areas. This species occasionally may breed in lake-level meadows as well, but mostly it is a species associated with the human landscape. Many starlings vacate the mountains during the winter, but small groups subsist in most years.

**American Pipit** *Anthus rubescens*

According to Verbeek and Hendricks (1994), the American Pipit has colonized the Sierra Nevada only since the 1970s, with most nests found in the southern part of the range. There are very few records of breeding in the Tahoe region, Knorr (2000) found the species breeding at Mount Rose in 1979. Considerable research activity in that area from 2006-2009 failed to find the species breeding, so it may be a sporadic breeder at best. As with Horned Larks, this species prefers barren high-elevation habitats for montane breeding, and likely habitats can be found in the Mount Rose/Houghton/Relay Peak area and perhaps Snow Valley Peak within Nevada, and the Job's/Job's Sister/Freel area in California. Pipits are regularly found along Lake Tahoe's barren beaches from October through mid-December, and often from late-March through mid-May.

**Cedar Waxwing** *Bombycilla cedrorum*

Cedar Waxwing is an uncommon fall migrant through the Carson Range, most commonly appearing in wet meadows, riparian areas, and residential areas with berry-producing ornamental plants. In years with high fruit-yield, waxwings can also be found in areas with abundant elderberry (*Sambucus*), cherry (*Prunus emarginatus*), mountain ash (*Sorbus californica*), or other berries. Small flocks may successfully winter at lower elevations, but large flocks generally deplete food resources quickly, and are forced to move on. As a consequence, the species can be quite nomadic in winter, and flocks may briefly pass through at any time.

**Orange-crowned Warbler** *Vermivora celata*

Overlapping migration and post-breeding dispersal patterns of two different subspecies have clouded our understanding of the breeding status of this species in the Carson Range. The interior subspecies, *V. c. orestera*, may very well breed in the Carson Range, but over 10 years worth of fieldwork in potential Orange-crowned Warbler habitat has failed to find strong evidence to support this. Each spring, *orestera* males can be found singing in seemingly appropriate habitat during late May and June, however, these birds never seem to commit to a territory and are seldom observed at the same location for more than a few days. Between-year recaptures at a mist-netting station in the Little Valley might suggest breeding there, but it may simply reflect high fidelity to post-breeding dispersal routes (Eidel and Gubanich 1998). Members of the brighter western subspecies, *V. c. lutescens*, reach wet meadows and riparian habitats of the Carson Range by the first few days of June. These arrivals nearly coincide with the territory establishment of the Carson's regularly breeding warblers. However, astute observers will note that most of

these birds have buffy wing bars, juveniles already dispersing upslope from their breeding grounds at lower elevations on the west slope. Dunn and Garrett (1997) describe *lutescens* as breeding in the "Lake Tahoe area" based on the distributions published in Grinnel and Miller (1944), but this is erroneous. However, this earlier mistake is understandable, for the vast majority of the Orange-crowns seen at Tahoe do belong to this subspecies. By late June they have arrived in large numbers, and in many years they can outnumber all other birds found in wet, willow-filled meadows and riparian habitats. By late August many migrating *orestera* have closed ranks and can be distinguished by their contrasting gray heads. Orange-crowned Warblers are abundant from mid-August through mid- to late-September. By mid-October the species is uncommon, and any remaining stragglers slowly trickle out of the area in accordance with the weather.

**Nashville Warbler** *Vermivora ruficapilla*

Nashville Warblers present another confusing distributional issue. The species is a common breeder in lower to middle elevations of the Carson Range, preferring open stands of conifers with dense understories of *Ceanothus*, *Quercus vaccinifolia*, and *Chrysolepis semipervirens*. Most breeders have arrived by the end of May. Large numbers of post-breeding Nashville Warblers invade the region starting in late July, frequently becoming abundant in high elevation chaparral and wet meadows, but it is unclear where these birds come from. These birds may originate from lower elevations on the west slope of the Sierra Nevada (dispersing upslope like the Orange-crowns), or they may represent a general southward push through the Sierra. The Nashville Warblers are never as abundant as the Orange-crowns, and by the end of August, the majority have left the region. Stragglers and migrants continue through mid-October.

**Virginia's Warbler** *Vermivora virginiae*

Several summer records in the Carson Range suggest that this species occasionally may attempt to breed in the Tahoe Basin. This species is known to breed, at least occasionally, in the Monitor Pass area, approximately 30 km to the southeast. In 2003, a male Virginia's Warbler held a territory at the top of the aspen stand along the Tunnel Creek road for almost the entire month of June, actively defending it against neighboring Nashville Warblers.

**Yellow Warbler** *Dendroica petechia*

Yellow Warblers are locally common breeders in wet, willow-dotted meadows and, to a lesser extent, moist chaparral (especially where *Salix* and *Prunus emarginata* are present). Much seemingly appropriate habitat remains unoccupied, and the species likely has experienced a considerable decline in this region. However, this species still can be found breeding in such places as Little Valley and Tahoe Meadows. Most breeders have arrived by the end of May. A small influx of migrants and post-breeding dispersers also join the Orange-crowned and Nashville warblers in the Carson's high, wet places during August.

**Black-throated Blue Warbler** *Dendroica caerulescens*

This species is strictly a vagrant to the Carson Range. I found and photographed a singing male in the extensive aspens along the southeast shore of Marlette Lake, 8 June 2004 (NBRC-2004-13).

**Yellow-rumped Warbler** *Dendroica coronata*

Yellow-rumped Warblers are the most common and widespread breeding warbler species in the Carson Range, occurring in conifer and mixed coniferous-deciduous forests and woodlands throughout the entire elevational gradient of the range (detected from 59% of 2008 point count stations). Local birds belong to the Audubon's Warbler (*D. c. auduboni*) subspecies. Nesting occurs from May until July, after which many birds disperse into a broader variety of vegetation types. This is a stout warbler, and many birds will stay well into December, subsisting on fruit and frozen insects, before retreating to lower elevations. In the spring, sustained periods of warm temperatures will encourage small numbers of birds to return as early as mid-March. Typically, however, most returning and northbound Audubon's Warblers arrive in mid-April. Most northbound migrants have moved on by mid-May, and local birds begin to settle on territories, especially at lower elevations within the range. The distinctive Myrtle Warbler (*D. c. coronata*) is a rare but annual passage migrant in spring and fall.

**Black-throated Gray Warbler** *Dendroica nigrescens*

Black-throated Gray Warblers generally breed in pinyon-juniper or mixed-oak-pine forests, habitats that, for the most part, do not exist in the Carson Range. Pockets of *Quercus chrysolepis* and *Q. chrysolepis* x *vaccinifolia* do exist in the northeast corner of Lake Tahoe, particularly around Stateline Point, Tunnel Creek, and Memorial Point, but these stunted and isolated habitats do not attract Black-throated Gray Warblers to breed there. Additionally, small pockets of single-leaf pinyon (*Pinus monophylla*) occur on the east slopes of Mount Rose and the peaks comprising the southern Carson Range in California (e.g. Job's Peak). Black-throated Gray Warblers may possibly breed in these pockets. Small numbers of migrants move through the Carson Range from mid-August through mid-September, with stragglers through early October.

**Townsend's Warbler** *Dendroica townsendi*

Townsend's Warbler is an uncommon migrant through the Carson Range. Spring records are concentrated in May, and fall records are concentrated from mid-August through mid-September, with stragglers through early November. Scattered summer records exist as well, but the species does not breed south of central Oregon.

**Hermit Warbler** *Dendroica occidentalis*

Hermit Warblers are fairly common breeders in the northern Tahoe basin, particularly in high-canopy areas where firs mix with incense cedar (*Calocedrus decurrens*) and sugar pine (*Pinus lambertiana*). Therefore, parts of the Carson Range above Incline Village may host a small breeding population. Singing males are occasionally found in seemingly appropriate mature conifer forest throughout the west slope of the Carson Range, but there is little evidence that nesting occurs. For example, on 22 June 2008, a singing male was detected along the TRTS (Tahoe Rim Trail, South) transect, in an area

dominated by large red fir with western white pine, but that was the only Hermit Warbler detection at any point count station for the entire season. It is even less likely that Hermit Warblers breed on the east slope of the Carson Range. Spring migrants begin to arrive by early May, with most birds probably on territory by the end of the month. Upslope dispersal and southbound migration swells local numbers throughout the area from late July through August, at which time the species may be found in a wider variety of forest habitats. Shortly after the end of August, the species is entirely absent from the Carson Range, and any apparent Hermit Warbler seen after early September should be examined closely to eliminate Townsend's x Hermit hybrid. Such birds are occasionally seen at Tahoe during migration.

**Black-and-white Warbler** *Mniotilta varia*

This is generally considered a rare but regular spring and summer vagrant throughout much of the eastern Sierra Nevada south of the Carson Range. However, I only know of one record for the Carson Range: Cave Rock hosted a Black-and-White Warbler 13 May 1999. Based on their regular vagrancy further south, future records can be expected.

**Prothonotary Warbler** *Protonotaria citrea*

This species is a rare vagrant to the Carson Range. A dead male was found in Little Valley on 31 May 1962 (Ryser 1963).

**MacGillivray's Warbler** *Oporornis tolmiei*

MacGillivray's Warblers are fairly common in aspen stands, riparian vegetation, and willow-lined meadows. Less commonly, they also can be found breeding in moist chaparral and coniferous habitats with a thick, moist understory of shrubs. Pockets of dense shrubs, shrub-layer complexity, and proximity to moisture (possibly correlated to herbaceous cover) all appear to be important to this species. The species becomes rare above 2700 m elevation. Low elevation arrivals begin in the first week of May, but most birds are not present until the end of the Month. A short but conspicuous pulse of migrants occurs in late August, and by early September, the species has left the Carson Range. A few stragglers trickle through for the remainder of September.

**Common Yellowthroat** *Geothlypis trichas*

This species was a former breeder in the wetlands of the southern Lake Tahoe basin, extirpated after the destruction of Rowland's Marsh for the construction of the Tahoe Keys. A singing male at Lower Prey meadows on 10 July 2007 is the only mid-summer record known from the Carson Range. Recent increases in cattails (*Typha*) and tule (*Schoenoplectus acutus*) around the Tahoe basin may encourage a return of this species. Yellowthroats are uncommon fall migrants to wet meadows, wetlands, and shrubby shoreline or riparian habitats, most numerous from mid-August through mid-September. A few spring records exist from the first half of May.

**Wilson's Warbler** *Wilsonia pusilla*

Wilson's Warblers are fairly common, ground-nesting warblers in aspen and the willows and alders of riparian areas and wet meadows, found throughout the elevational gradient of this study in appropriate habitat. A lush, often grassy, herbaceous ground cover



appears to be required for nesting. Early arrivals can appear by late April, but most Wilson's Warblers do not arrive until mid-May. As a ground nesting bird, high-elevation nesters may have to wait another month before attempting to nest, waiting for deep snowpacks to melt. By August, dispersing birds have joined the ranks of other dispersing warblers among the willows of the higher elevation wet meadows. A steady movement of Wilson's Warblers through the Carson Range appears to slowly taper over the second half of September.

#### **Western Tanager** *Piranga ludoviciana*

This colorful bird is made less conspicuous by its preference for coniferous treetops. Nonetheless, tanagers are quite common through a variety of conifer and forest types (especially open forests where several conifer species occur), up to but generally not including the pure lodgepole forests found in high elevations of the Carson Range. Early arrivals may appear at lake-level by the last days of April, but most tanagers arrive, often quite suddenly and *en masse*, at the end of May. Fall migration begins in late July or early August, and the stream of southbound birds typically tapers off in mid-September.

#### **Green-tailed Towhee** *Pipilo chlorurus*

Green-tailed Towhees are a fairly common breeder in their preferred habitat, extensive patches of *Ceanothus* chaparral, but also thinly distributed elsewhere in open forests and woodlands with shrubby understories. Spring arrivals appear from late April through mid-May, and nesting typically begins in early June, depending on elevation and aspect. Some individuals move upslope into subalpine meadows, post-breeding (July-August), and dispersal and migration keep Green-tailed Towhees moving through the Carson Range through early October.

#### **Spotted Towhee** *Pipilo maculatus*

Spotted Towhee is considerably less common as a breeder, but unlike Green-tailed Towhees, individuals can be present in the Carson Range year-round. Breeding birds can be sympatric with Green-tailed Towhees, although Spotted Towhees show more affinity for *Arctosaphylos* chaparral, and especially the chaparral-riparian interface. Additionally, Spotted Towhee breeding generally is restricted to elevations below 2300 m, occurring higher in chaparral on the east slope, but most common at lake-level on the west slope of the range. Breeding in the Tahoe basin may be a new phenomenon within the last few decades, as earlier references considered the species to be only a migrant and "occasional winter visitant" (Orr and Moffitt 1971) or extremely rare during the summer (LTAS 1978). There is some evidence of upslope post-breeding dispersal in Spotted Towhees as well (e.g. a bird detected on a point count near the summit of Genoa Peak, 7 July 2008). Numbers are probably greatest in September and October, when migrant Towhees can be found scattered throughout various lake-level riparian and shrubby habitats. Wintering birds favor lake-level willow thickets or residential areas with bird feeders.

#### **Chipping Sparrow** *Spizella passerina*

Chipping Sparrows are common breeding birds in open conifers throughout the Carson Range, especially pine forests and woodlands with dry clearings in which to forage on the ground. Spring migrants arrive in mid-April. Large mixed flocks of *Spizella* begin to

form at lake-level in late August. Initially, these almost purely comprise Chipping Sparrows, but Brewer's Sparrows can be quite common in these flocks in September. Most Brewer's Sparrows migrate out of the area within that month, but Chipping Sparrows can remain abundant until mid-October, with stragglers and migrants through mid-November.

**Brewer's Sparrow** *Spizella breweri*

Brewer's Sparrow breeds in expanses dominated by sagebrush (*Artemisia tridentata*), which, in the elevations under consideration for this study, are found only at relatively high elevations. Ray (1905) reports finding a "small dull-colored bird about the size of a Chipping Sparrow which (they) were unable to secure or identify" on top of Freel Peak, which was almost certainly this species, and then he later (1910) describes a nest from 22 June 1909 at Spooner Station, where he found them to be abundant. Moffitt collected several mid-summer Brewer's Sparrows, adults and a juvenile, in the Spooner-Glenbrook area in 1936 (Orr and Moffitt 1971), which is surprising given its elevation and current vegetation. Ray (1910) pointed out that as of his visit in 1909 the whole area had been stripped of its timber, so indeed, the area surrounding Spooner and Glenbrook was surely a different habitat 100 years ago, and one may suspect that sagebrush was a more dominant part of the landscape in that area. Orr found the species to be common high on the western slope of Genoa Peak on 6 July 1937 (Orr and Moffitt), where it is still common today. It can be found easily in most years in similar contexts along the crest of the range (e.g. Snow Valley Peak, South Camp Peak, etc.).

**Black-chinned Sparrow** *Spizella atrogularis*

This species is an unexpected vagrant to the Carson Range. This single record is of a female-type found on 20 August 2001 along the Ophir Creek Trail, at the base of Tahoe Meadows. Presumably this bird had drifted upslope from low elevations on the west slope of the Sierra Nevada.

**Vesper Sparrow** *Pooecetes gramineus*

This species has been observed singing in Little Valley in recent years, but it was unknown whether the species was breeding in Little Valley or simply transient. Kelleher (1970) lists the species in his checklist for the Carson Range, but makes no specific mention of its breeding status. On 2 June 2008, I observed 5-6 singing males in the southern end of the Little Valley meadow. These males remained on territory through the breeding period and were observed singing on subsequent visits the following month. Visits to the area in 2009 revealed that the population was still present, thus likely represents a small breeding group. Breeding has not yet been confirmed for the Lake Tahoe basin, but it is suspected that this species occasionally breeds in appropriate habitat (low sagebrush) along the high ridgetops, particularly in the Carson Pass area. Sporadic breeding also may occur along the crest of the Carson Range.

**Lark Sparrow** *Chondestes grammacus*

Lark Sparrows are rare migrants through the Carson Range, occasionally detected in open or shrubby habitats at lake-level. Spring migrants are from mid-April through mid-May, and fall migrants have been recorded from mid-July through mid-October.

**Black-throated Sparrow *Amphispiza bilineata***

The Black-throated Sparrow is a rare but regular transient during April and May. Fall vagrants have also been recorded on the California side of the Tahoe basin. Vagrants are probably annual in small numbers, and may be increasing with a general northward population shift/increase. The species has been documented breeding in the dry, low-elevation foothills of the Carson Range, well below the elevational threshold of this study, so spring migrants may simply be overshoots from this population.

**Sage Sparrow *Amphispiza belli***

I only know of only one confirmed record for the Carson Range as of this writing. An interior race bird (*A. b. nevadensis*) was seen and photographed along the Tunnel Creek Road on 23 October 2007. The species is probably far more regular common in fall migration than records suggest, as bird skulks from shrub to shrub, rarely revealing itself except during the breeding season. Further, their preferred vegetation (sagebrush and chaparral) receives very little birder/researcher attention during migration. Spring migration through northern Nevada happens in early March (Alcorn 1988), so it is unlikely that strays would find themselves in the Carson Range, but even more unlikely that they would be detected at that time. Fall migrants should be looked for from late August through early November.

**Savannah Sparrow *Passerculus sandwichensis***

Contrary to recent reports (Manley et al. 2000, Romsos et al. 2000), we have not lost this species since the Post-Comstock era. Within the Tahoe basin, Savannah Sparrows are common breeder at grassy meadows, often wet, and mostly at or near lake-level (e.g. Rabe Meadows). The species also breeds at Grass Lake, near Luther Pass, so it is not completely restricted by elevation. Seemingly appropriate habitat exists in Spooner Meadow, but breeding is not known from that location. Additionally, Savannah Sparrows, are fairly common fall migrants, widespread and conspicuous from mid-August through October in grassy patches around the Lake Tahoe's shoreline. Members of several subspecies may be present in fall Savannah Sparrow flocks. A few birds persist through mid-December.

**Fox Sparrow *Passerella iliaca***

Fox Sparrows are common to abundant and conspicuous breeders wherever there is sufficient shrub cover: chaparral slopes, open forests and woodlands with thick *Ceanothus* understories, riparian corridors, mature aspen stands, willow-bordered meadows, regenerating forest fires and avalanche paths, etc. (detected from 59% of 2008 point count stations). Returning spring birds may drift upslope as early as late March in some years, but not until May in other years. Nesting typically begins in May, depending on elevation, aspect, weather, and snowpack. Dispersers and migrants typically are present through mid- to late November, with a few stragglers into December. Local birds belong to the *P. i. megarhyncha* subspecies, but members of the *P. i. unalaschensis*, *P. i. schistacea*, and *P. i. iliaca* subspecies groups have all been observed or collected during migration in the Tahoe basin.

### **Song Sparrow** *Melospiza melodia*

Song Sparrows are common to abundant breeders in low to mid-elevation shrubby habitats wherever moisture is present. They are especially common in wet meadows and riparian habitats, exhibiting a strong affiliation with willows, and may occur as sporadic or uncommon breeders in these habitats to approximately 2700 m elevation. At low elevations, small numbers winter in willow thickets, although sustained periods of inclement weather drive all but the hardiest out of the Tahoe basin. Returning Song Sparrows are generally conspicuous, and start singing by mid-March. Breeding birds have generally arrived by late March through mid-April. Song Sparrow numbers peak from mid-August through mid-November, concentrating at low elevations after storms, and many birds will remain through the first several winter storm cycles.

### **Lincoln's Sparrow** *Melospiza lincolnii*

Lincoln's Sparrow is the Song Sparrow's higher elevation counterpart, requiring more herbaceous cover in their riparian and wet meadow habitats, as well as preferring them to be even boggier than those of Song Sparrows, often where snowmelt flows in rivulets or sheet runoff. Additionally, Lincoln's Sparrow prefers low willows, such as *Salix orestera* and *S. arctica*, or occasionally other species in boggy situations where willows are kept prostrate through mechanical means (i.e. trails at ski resorts). At present, the dividing boundary for these two species in the Carson Range is poorly defined, varies slightly from year to year, and typically encompasses a zone of sympatry in areas like Tahoe Meadows and the wet meadows at top of North Canyon. Spring arrivals begin to appear by late April, but birds are generally not on territory until late May to late June, depending on local conditions. Fall migration brings Lincoln's Sparrows to willows and other shrubby habitats at lake-level from early September through early November. This species' distribution is largely dictated by the timing and extent of snowmelt, and is likely to change dramatically under certain predicted climate change models.

### **White-crowned Sparrow** *Zonotrichia leucophrys*

Mountain White-crowned Sparrows (*Z. l. oriantha*) are fairly common breeders in mid- to high elevation wet, shrubby habitats, most commonly moist chaparral, wet meadow, riparian, and aspen habitats. Occasionally, White-crowned Sparrows can be found nesting down to lake-level, but they are most commonly associated with high meadows, where the species can be abundant. Breeding birds slowly arrive to the Carson Range from mid-April through mid-May, and fall migration tapers their numbers from late August through mid-September. During September, the migrant *Z. l. gambelli* begin to arrive, with numbers peaking from late September through mid-November, especially in lake-level shrubby habitats. Small numbers may overwinter at lake-level in mild winters. Northbound *Z. l. gambelli* begin to return to the Carson Range in mid-March, peak in the second half of April, and disappear by late May.

### **Golden-crowned Sparrow** *Zonotrichia atricapilla*

Golden-crowned Sparrows exhibit the exact same distributional patterns in the Carson Range as *gambelli* White-crowned Sparrows, regularly occurring in mixed *Zonotrichia* flocks. Golden-crowned Sparrows, however, are considerably less common.

### **Dark-eyed Junco** *Junco hyemalis*

Dark-eyed Juncos are one of the most common and widespread passerines in the Carson Range, detected from 63% of 2008 point counts. They breed in a variety of vegetation types, with the only requirements seeming to be the presence of a few trees and sufficient ground-level vegetation under which to hide a nest. They are most common in open pine forests and mature aspen forests. The timing of Junco arrival on territories is largely contingent on weather and snowpack. However, large flocks can be found at low elevations in the range by mid-March, occasionally earlier. Lake-level nesting may commence by early May, possibly earlier in favorable years. However, as a ground-nesting bird, juncos need to be careful to not initiate nesting too early. Late spring snowfalls are a regular occurrence at in the Carson Range, and snow, sleet, or hail may occasionally fall at any time during the summer. As a possible adaptation to this situation, this species often nests in rodent burrows or other holes in the ground at Lake Tahoe. The desire to have a snow-bearing roof over the head was noted by Hanford (1913), who found two nests successfully sheltering eggs and young from several inches of snow, built inside of discarded tin cans. Ray (1903) also reported a junco nest from an empty tin can. Feeding flocks have re-formed by late summer, and there is a large passage of migrants during the fall. From mid-September through mid-December, large flocks of juncos can be found in shrubby habitats of lower elevations; these flocks often contain several subspecies, including not only our resident Oregon Junco (*J. h. thurberi*), but also Slate-colored Juncos (*J. h. cismontanus/hyemalis*). By mid-December, juncos are restricted to shrubby areas at lake-level or residential areas with bird feeders. At such places, juncos may remain locally common throughout the winter, especially in low snow years.

### **Rose-breasted Grosbeak** *Pheucticus ludovicianus*

This species is a rare but regular summer vagrant to the Carson Range. Because of their similarity to Black-headed Grosbeaks, females are far more likely to go undetected. I know of three records for the Carson Range, all of which are males:

A second-year male visited a feeder in Incline Village from 27-30 June 2001 (NBRC-2007-103)

A singing male was observed in the mature aspens in the southeast corner of Marlette Lake, 28 June 2004.

A male was observed at Spooner Lake on 14 August 2006. (NBRC-2007-091)

### **Black-headed Grosbeak** *Pheucticus melanocephalus*

Black-headed Grosbeaks are uncommon to locally common breeders in low to mid-elevation in riparian, willow-bordered meadow, and aspen habitats. Numbers in the Carson Range are greatest during spring migration, from mid-May through mid-June. Local breeders and dispersing or southbound migrants are present through late August, with smaller numbers passing through until mid-September.

### **Lazuli Bunting** *Passerina amoena*

Lazuli Buntings breed in patchy yet dense shrubby vegetation. In the Carson Range, this species shows considerable inter-annual variation in terms of abundance and distribution, potentially occurring in forest openings, edges, post-fire regeneration, mature aspen

forests, chaparral hillsides, and wet meadows. First spring arrivals may reach the Carson by mid-May, but buntings may not arrive on territory until mid-June, even at lake-level. The species may be scarce throughout lower and mid-elevation habitats, but is consistently common to abundant in high elevation wet meadows and moist chaparral, from late June through early August. Presumably, most of these birds are breeding, but a presumed influx of post-breeding dispersers from the west slope of the Sierra Nevada muddies the picture. Migration from the Carson Range begins in mid August and tapers through September.

**Red-winged Blackbird** *Agelaius phoeniceus*

Red-winged blackbirds are loosely colonial in low to mid-elevation wetlands and wet meadows throughout the Carson Range. The species is most common as a breeder at lake-level wetlands. The colony in Spooner Meadows was noted as far back as 1910 (Ray 1910a). Small groups regularly persist at lake-level meadows and wetlands through all but the harshest winters, but spring arrivals typically return during March. A second influx of migrants may be detected in August, and by mid-October most Red-winged Blackbirds have left for lower elevations.

**Western Meadowlark** *Sturnella neglecta*

Western Meadowlarks are regular spring and fall migrants to lake-level fields and meadows. They are not believed to breed in the Carson Range, at least not regularly, although Milton Ray did find several active nests at Rowland's Marsh, on the California side of the Tahoe basin, in 1927 (Orr and Moffitt 1971). Migrants are most commonly encountered during March and April, and then again from early September through October.

**Yellow-headed Blackbird** *Xanthocephalus xanthocephalus*

Yellow-headed Blackbirds breed in a few scattered colonies in wetlands on the California side of the Tahoe basin. Post-breeding dispersal and migration to and from the Tahoe causes individuals and small flocks of this species to be recorded from lake-level and wetlands and meadows on the Nevada side of the basin. Typically, the species is entirely absent by early September, although occasional migrants have been recorded throughout the fall.

**Brewer's Blackbird** *Euphagus cyanocephalus*

Brewer's Blackbird is a common, semi-colonial breeder at low to mid-elevation wetlands and wet meadows throughout the Carson Range. Flocks increasingly attempt to spend the winter in the Tahoe basin, succeeding at lake-level and in residential areas in many years, but in other years they are absent after prolonged periods of stormy winter conditions. Regardless of the winter conditions, large numbers typically are present at lake-level by early to late-March.

**Brown-headed Cowbird** *Molothrus ater*

Cowbirds were absent from almost the entire Sierra Nevada prior to the 1930s (Rothstein et al. 1980), and were unknown from the Tahoe Basin prior to 1959 (Orr and Moffitt 1971). Now they may be found widely dispersed throughout the lower and middle

elevations of the Carson Range during the warmer months, females spreading out to scout and parasitize nests each morning, often with males in close attendance, and then regrouping by mid-day in small flocks. Cowbirds can be found in almost all habitats, but they are not common in dense or shady forests, and their density appears to decline with increasing elevation, such that they are fairly uncommon above approximately 2500 m. By mid-summer, many have stopped reproductive activity and join mixed blackbird flocks in low elevation meadows or residential areas with bird feeders. Small numbers typically attempt to over-winter in association with mixed blackbird flocks, but ultimately few actually do. Returning birds arrive around mid-April.

**Gray-crowned Rosy-Finch** *Leucosticte tephrocotis*

Rosy-finches are restricted to highest elevations during the breeding season, and the rim of the Tahoe Basin barely reaches sufficient heights for these alpinists. They prefer areas with persistent snowfields, in combination with cliffs within which rosy-finches place their nests. The species is known to breed in a few places along the Sierra crest at Tahoe, but these conditions are scarce in the Carson Range. Nonetheless, suitable conditions may be present in some years in the Mount Rose/Houghton/Relay Peak area in Nevada, and the Job's/Job's Sister area in California. The species has been observed in the Mount Rose area during the breeding season in the 1970s and then again in 2000s, but no records of breeding in the Carson Range exist. They are more commonly encountered in the Mount Rose area during spring and fall. Small flocks also have been encountered at lower elevations in the region, including down to lake-level during April and October. During winter, it is believed that all of the rosy-finches from the Tahoe area descend into lower elevation hills of the adjacent Great Basin, where large flocks sometimes can be found.

**Pine Grosbeak** *Pinicola enucleator*

Pine Grosbeak is an uncommon resident breeder of higher elevation red fir, aspen, lodgepole pine, mountain hemlock (*Tsuga mertensiana*), and whitebark-western white pine (*Pinus monticola*) habitats. Active nests have been found in North Canyon and in near Marlette Lake. In the Carson Range, this species bird is most commonly encountered in the Tahoe Meadows area. Seasonal distributional changes are minor, but there does appear to be some movement within the area, likely more reflective of food availability than weather conditions.

**Purple Finch** *Carpodacus purpureus*

This species breeds on the west slope of the Sierra Nevada, but post-breeding dispersal in late summer and fall occasionally brings it over the Sierra crest. As a common species elsewhere in the Sierra Nevada, many people expect them in the Tahoe basin, and misidentified House and Cassin's Finches are commonly reported from bird feeders. However, Purple Finch is extremely rare in the Carson Range, and consequently is a Nevada Bird Records Committee review species. One was observed and mist-netted in an aspen stand along Logan House Creek on 23 July 2003 (NBRC-2003-12).

**Cassin's Finch** *Carpodacus cassinii*

This species is fairly common in a variety of coniferous and aspen forests, detected from almost 46% of 2008 point count stations. Typically, at low elevations, nesting begins in mid-May, but not until late in June at the highest elevations, although weather conditions dictate the timing to some degree. After fledging, family groups quickly join foraging flocks, and larger groups aggregate by mid-July. From fall through spring, flocks can be somewhat nomadic, often settling near well-stocked bird feeders for several weeks, only to disappear suddenly for no apparent reason. Many flocks appear to retreat to lower elevations for part or all of the winter.

**House Finch** *Carpodacus mexicanus*

House Finches are locally common at low elevations, especially around the southern end of Lake Tahoe. They associate closely with human settlement, although they have been common in southern Tahoe basin for over 100 years; Ray (1903) called House Finches "extremely common" at South Lake. Most House Finches leave the Tahoe basin in winter, retreating to lower elevations, but many will settle for the winter in the vicinity of bird feeders.

**Red Crossbill** *Loxia curvirostra*

The distribution of this species is exceedingly difficult to predict. Red Crossbills are highly nomadic throughout the year, only settling to breed when large, mature pinecone crops are found. As a result, this species is capable of breeding at almost any time of year. Further, crossbills can be extremely common and widespread in some years, only to later disappear entirely from the Carson Range for several years on end. The systematics of this species are a topic of much recent work, and further work may identify 8-9 distinct yet cryptic species within the current taxon. These individual "types" are identified based primarily on the structure of flight calls and morphology, which is closely tied to preferred food source (Benkman 1993, Groth 1993). The crossbills most typically observed in the Carson Range exploit lodgepole pines. It is uncertain which type is involved, but it likely Groth's Type 5 (Benkman 1993, Groth 1993).

**Pine Siskin** *Carduelis pinus*

Pine Siskins are highly nomadic and therefore unpredictable in the Carson Range. In some years they may be quite scarce, but typically they are common summer breeders in middle to high elevation conifer or mixed-conifer forests. By mid-August, flocks form and the siskins begin to wander, exploiting a much wider variety of habitats including weedy fields, riparian corridors, and residential areas, often descending to lake-level or below, or vacating the region altogether. In some years, large numbers may winter; in other years they may be entirely absent.

**Lesser Goldfinch** *Carduelis psaltria*

This species may be increasing in the Carson Range, where scattered pairs breed in low-elevation meadows and residential areas. From late July through September, numbers increase with migrants and dispersers from lower elevations. This species can often be found wintering in small numbers in residential areas with bird feeders. Both goldfinches are extremely fond of the seeds of thistles (*Cirsium*) and other windborne weeds.



**American Goldfinch** *Carduelis tristis*

American Goldfinch is strictly a fall migrant in the Carson Range, occurring at lake-level meadows, weedy fields, shoreline thickets, and bird feeders from late August through October.

**Evening Grosbeak** *Coccothraustes vespertinus*

Like the crossbills and siskins, Evening Grosbeaks are highly nomadic, and therefore extremely unpredictable in the Carson Range. At times they can be abundant and widespread breeders, or exceedingly abundant transients during the non-breeding season, sometimes in flocks numbering in the thousands, but in many years they can be quite scarce or completely absent. The only consistency is that this species is always found in trees.

**House Sparrow** *Passer domesticus*

The introduced House Sparrow is a locally common breeder in the Tahoe basin, found in close association with human settlement. Orr and Moffitt (1971) considered the species to be a spring vagrant to the region, citing only two records from 1927. Now the species can be found breeding in heavily populated areas, with a small number remaining through each winter. House Sparrows are rarely encountered away from urban or agricultural areas, although fall dispersal can find some individuals or small groups wandering through unexpected parts of the Carson Range.

## **Hypothetical**

These species have been placed on this list because, despite being reported as occurring in the Carson Range, documentation was deemed insufficient.

**Western Gull** *Larus occidentalis*

Craigmile (1906) listed this as her only species of gull from a trip to the Glenbrook area in August 1906. Surely this is a misidentification. Western Gull is a Nevada Bird Records Committee review species, and as of this writing, only seven committee-endorsed records exist for the entire state, all of which have occurred between late October and mid-February.

**Great Gray Owl** *Strix nebulosa*

This species was reported as being seen in Little Valley on multiple occasions during one summer in the 1960s (Kelleher 1970), and this report has been perpetuated in the literature (Ryser 1985, Walters 2004). However, stray Great Gray Owls are most likely to occur in the Carson Range during the non-breeding season, and I believe the identification may be erroneous, probably referring to young Great Horned Owls.

**Black-chinned Hummingbird** *Archilochus alexandri*

Black-chinned Hummingbirds are seen throughout the summer at feeders along the lower, eastern flanks of the Carson Range, below the elevational limits of this study. Upslope strays are expected, but to date, none have been documented.

**Allen's Hummingbird *Selasphorus sasin***

In an early checklist of birds seen in August, Craigmile (1906) listed Allen's and Calliope Hummingbirds only. The identification of Allen's Hummingbird is surely in error and refers to Rufous, the most common species of hummingbird in the Carson at that time. Occasional vagrants may stray to the Carson Range, but would be almost impossible to differentiate from the similar Rufous Hummingbirds.

**Gray Jay *Perisoreus obscurus***

There is a sight report of a Gray Jay from Glenbrook, 17 August 1923 (Parmenter 1924). The bird was observed in full view for an estimated 10 minutes, but not described in any detail. Additionally, the species was listed as recorded from Lake Tahoe in the Third Edition of the American Ornithologist's Union (1910) checklist of North American birds, but Grinnell and Miller (1944), believed this to be based on misidentification of other birds. In all likelihood, these records all pertain to Clark's Nutcracker. The nearest Gray Jay populations are probably in Lake Almanor area of Plumas County, California (Domingo Springs). Coastal birds have reached Sonoma County, to points south of Lake Tahoe, but their pattern of winter vagrancy does not lend much support to these old, poorly documented reports from summertime.

**Black-capped Chickadee *Poecile atricapillus***

The ESIA (1994) checklist has Black-capped Chickadee listed as "rare" in spring through fall. This is wholly incorrect, as the Black-capped Chickadees do not occur any closer than extreme northwestern California and southern Oregon. Unfortunately, Black-capped Chickadees get reported in the Lake Tahoe area regularly by eastern birders who do not know any better. Beware that in late summer, worn Mountain Chickadees can be almost completely lacking a white supercilium, as the white is restricted to the feather tips. Were they to occur in the Carson Range (which they do not), Black-capped Chickadees might still be distinguished by having proportionately longer tails, strong white edging to the secondaries, and several other subtler plumage differences.

**Crissal Thrasher *Toxostoma crissale***

A female, collected by Thomas Burleigh 12 April 1964, has been reported in the literature as from "North Lake Tahoe" (Alcorn 1988). This specimen (USNM #563795) was reported as missing by Johnson (1990), but has since been relocated. The locality on the specimen label is "Las Vegas, Nevada," but was entered incorrectly in the museum ledger, immediately following a series of specimens from Tahoe.

**Ovenbird *Seiurus aurocapillus***

An experienced seasonal USFS bird surveyor from New Jersey, where Ovenbirds are fairly common, thought he heard a singing Ovenbird in the aspens around Bliss Pond on 21 June 2004. In the western part of its range, ovenbirds are closely associated with aspen. Unfortunately the bird was never seen, and I cannot eliminate the possibility that it was an aberrant Nashville Warbler, which has a superficially similar song.

**Tricolored Blackbird** *Agelaius tricolor*

R. H. Beck reported observing this species to be breeding "on the shores at Lake Tahoe," and collected a set of set of five eggs on 12 June 1896 (Barlow and Price 1901, Ray 1903). Since that time, the Tricolored Blackbird has certainly been extirpated as a breeder at Tahoe, if it ever was one (the identification of these birds has been questioned by Grinnell and Miller (1944)). However, a small colony of Tricolored Blackbirds does breed at Gardnerville, and individuals and small groups might be expected to migrate over Kingsbury Grade on their way to the main Tricolored populations in California.

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Table 1. Bird species observed during 5-minute point counts in the Carson Range, 2008. Only those species utilized for analyses are included (see Methods for details).

Common Name	Scientific Name
Mourning Dove	<i>Zenaida macroura</i>
Calliope Hummingbird	<i>Stellula calliope</i>
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>
Williamson's Sapsucker	<i>S. thyroideus</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>P. villosus</i>
White-headed Woodpecker	<i>P. albolarvatus</i>
Black-backed Woodpecker	<i>P. arcticus</i>
Red-shafted Flicker	<i>Colaptes auratus collaris</i>
Olive-sided Flycatcher	<i>Contopus cooperi</i>
Western Wood-Pewee	<i>C. sordidulus</i>
Hammond's Flycatcher	<i>Empidonax hammondii</i>
Dusky Flycatcher	<i>E. oberholseri</i>
Solitary Vireo	<i>Vireo plumbeus/cassinii</i>
Warbling Vireo	<i>V. gilvus</i>
Steller's Jay	<i>Cyanocitta stelleri</i>
Mountain Chickadee	<i>Poecile gambeli</i>
Bushtit	<i>Psaltriparus minimus</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>
White-breasted Nuthatch	<i>S. carolinensis</i>
Pygmy Nuthatch	<i>S. pygmaea</i>
Brown Creeper	<i>Certhia americana</i>
Rock Wren	<i>Salpinctes obsoletus</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
Winter Wren	<i>Troglodytes troglodytes</i>
House Wren	<i>T. aedon</i>
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Ruby-crowned Kinglet	<i>R. calendula</i>
Blue-gray Gnatcatcher	<i>Poliopitila caerulea</i>
Western Bluebird	<i>Sialia mexicana</i>
Mountain Bluebird	<i>S. currucoides</i>
Townsend's Solitaire	<i>Myadestes townsendi</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Hermit Thrush	<i>C. guttatus</i>
American Robin	<i>Turdus migratorius</i>
European Starling	<i>Sturnus vulgaris</i>
Orange-crowned Warbler	<i>Vermivora celata</i>
Nashville Warbler	<i>V. ruficapilla</i>
Yellow Warbler	<i>Dendroica petechia</i>
Audubon's Warbler	<i>D. coronata auduboni</i>
MacGillivray's Warbler	<i>Oporornis tolmiei</i>

Table 1. (cont'd)

Common Name	Scientific Name
Wilson's Warbler	<i>Wilsonia pusilla</i>
Western Tanager	<i>Piranga ludoviciana</i>
Green-tailed Towhee	<i>Pipilo chlorurus</i>
Spotted Towhee	<i>P. maculatus</i>
Chipping Sparrow	<i>Spizella passerina</i>
Brewer's Sparrow	<i>S. breweri</i>
Vesper Sparrow	<i>Poocetes gramineus</i>
Fox Sparrow	<i>Passerella iliaca</i>
Song Sparrow	<i>Melospiza melodia</i>
Lincoln's Sparrow	<i>M. lincolnii</i>
Mountain White-crowned Sparrow	<i>Zonotrichia leucophrys oriantha</i>
Oregon Junco	<i>Junco hyemalis thurberi</i>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Lazuli Bunting	<i>Passerina amoena</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Pine Grosbeak	<i>Pinicola enucleator</i>
Cassin's Finch	<i>Carpodacus cassinii</i>
Red Crossbill	<i>Loxia curvirostra</i>
Pine Siskin	<i>Carduelis pinus</i>
Evening Grosbeak	<i>Coccothraustes vespertinus</i>

Table 2. Environmental and habitat variables used in model selection to predict bird species richness (BSR), mean bird abundance (MBA), and Warbling Vireo, Steller's Jay, and Douglas' Squirrel abundance from point count data in aspen stands, Lake Tahoe Basin, 2009. Model abbreviations in parentheses.

Habitat Variable	Units	Habitat Variable	Units
Tree-class cover (Tree)	%	Tree species richness	#
Tree-class conifer cover (ConTr)	%	Canopy cover	%
Tree-class <i>Pinus</i> cover (PiTr)	%	Shrub cover (Shrub)	%
Tree-class <i>Abies</i> cover (AbTr)	%	Shrub-class conifer cover (ConShr)	%
Tree-class deciduous cover (DecTr)	%	Shrub-class riparian cover (RipShr)	%
Tree-class <i>Populus</i> cover (PopTr)	%	Shrub species richness	#
Maximum tree height	m	Herbaceous cover (Herb)	%
Maximum tree dbh	cm		

Table 3. Parameter estimates from optimal habitat models (most-parameterized model  $\Delta AIC \leq 2$ ), for Bird Species Richness (BSR) and Total Bird Abundance (TBA) from 2008 point count data, Carson Range, NV.

Parameter	Estimate	SE	t-value	P
<b>a. BSR</b>				
(Intercept)	5.02	0.49	10.12	<0.001
Tree cover	-0.07	0.25	2.76	0.006
Herbaceous cover	0.02	0.01	2.26	0.025
Tree species richness	0.47	0.14	3.41	<0.001
Tree-class <i>Populus</i> cover	14.21	2.87	4.95	<0.001
Tree-class conifer cover	6.61	2.58	2.56	0.011
Shrub-class conifer cover	-3.32	2.59	1.29	0.200
Shrub-class "riparian"	12.18	3.00	4.06	<0.001
Shrub-class "riparian" <sup>2</sup>	-16.42	5.34	3.07	0.002
<b>b. TBA</b>				
(Intercept)	8.46	0.98	8.60	<0.001
Tree cover	-0.15	0.05	3.09	0.002
Herbaceous cover	0.06	0.02	3.38	<0.001
Tree species richness	0.71	0.27	2.66	0.008
Tree-class <i>Abies</i> cover	13.69	5.52	2.48	0.014
Tree-class <i>Pinus</i> cover	12.01	5.04	2.38	0.018
Tree-class <i>Populus</i> cover	32.76	5.49	5.96	<0.001
Shrub-class conifer cover	-6.78	5.12	1.32	0.187
Shrub-class "riparian"	5.73	2.40	2.39	0.017

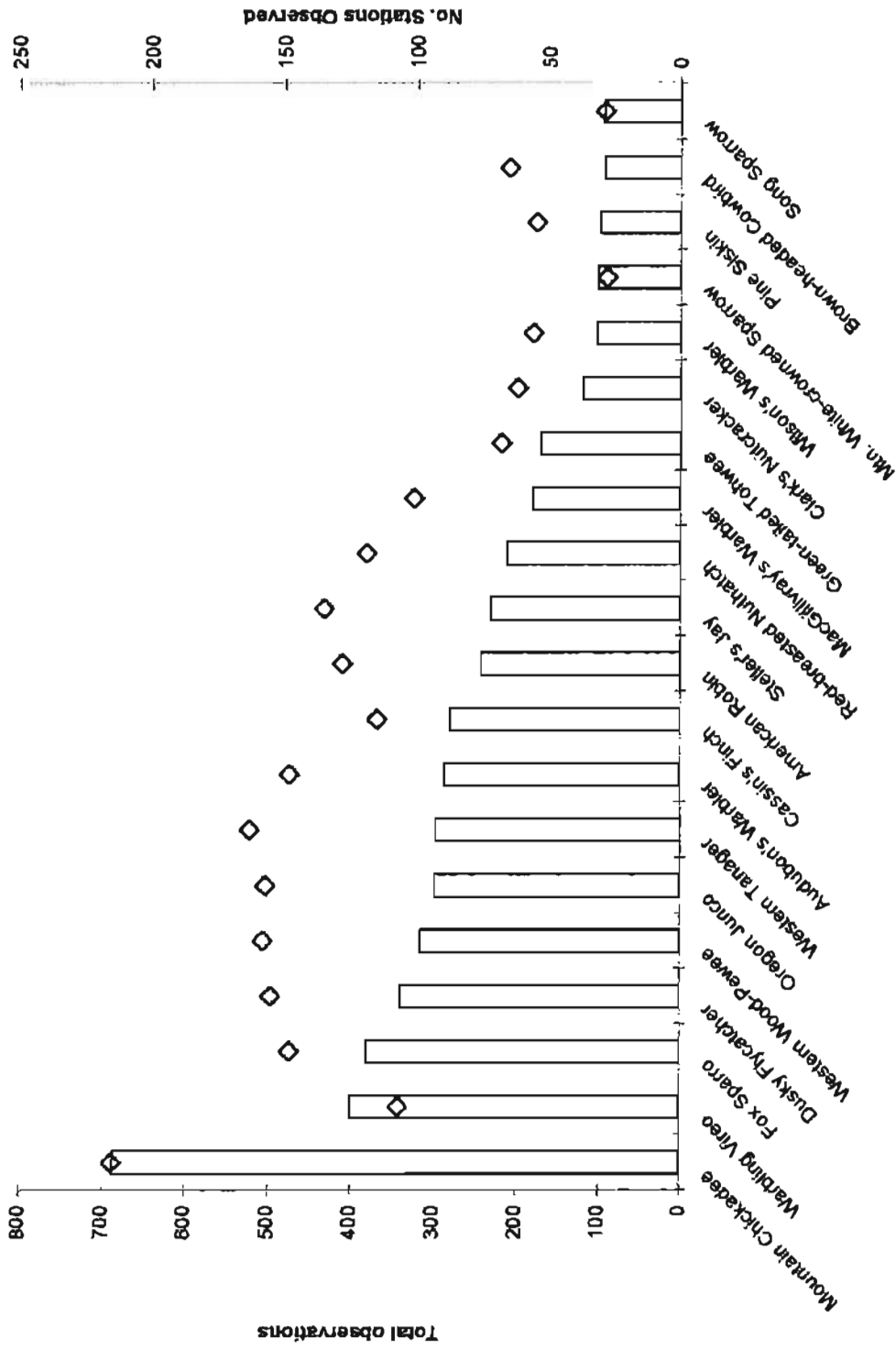


Figure 1. Total observations (bars) and the number of point count stations from which observations were made (diamonds) for the 15 most commonly observed species during point count sampling in the Carson Range, NV, 2008. All detections.

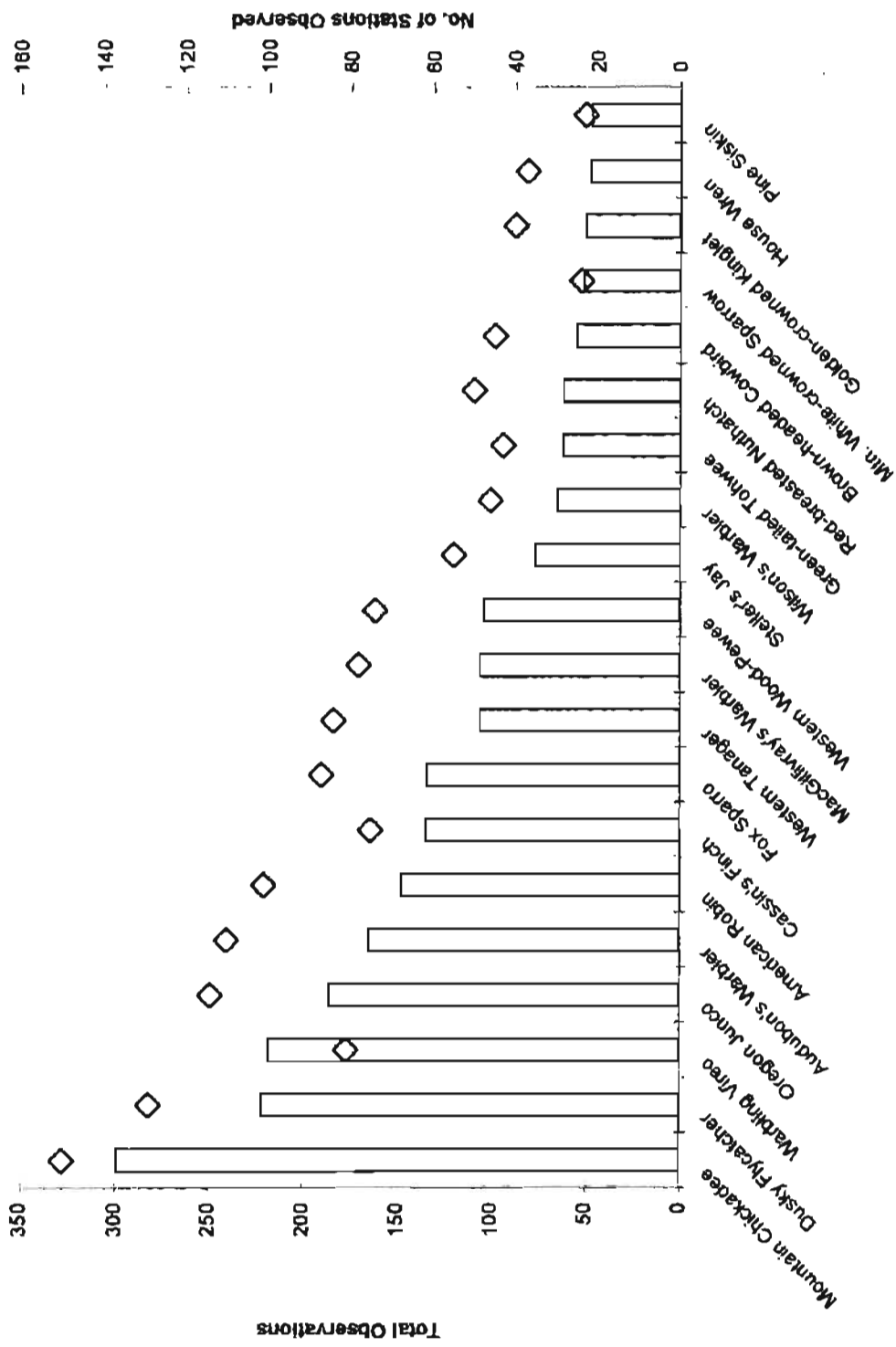


Figure 2. Total observations (bars) and the number of point count stations from which observations were made (diamonds) for the 15 most commonly observed species during point count sampling in the Carson Range, NV, 2008. Restricted to detections within 50 m.

APPENDIX A. Checklist of 232 bird species known to have occurred in the Carson Range, including Nevada portions of Lake Tahoe and the east slope of the range above approximately 1700 m elevation. Confirmed current or former breeding species are marked with an asterisk (\*)

<b>Greater White-fronted Goose</b> - <i>Anser albifrons</i>	<b>Mountain Quail</b> - <i>Oreortyx pictus</i> *
<b>Snow Goose</b> - <i>Chen caerulescens</i>	<b>California Quail</b> - <i>Callipepla californica</i> *
<b>Ross' Goose</b> - <i>Chen rossii</i>	<b>Chukar</b> - <i>Alectoris chukar</i>
<b>Cackling Goose</b> - <i>Branta hutchinsii</i>	<b>Wild Turkey</b> - <i>Meleagris gallopavo</i>
<b>Canada Goose</b> - <i>Branta canadensis</i> *	<b>Pacific Loon</b> - <i>Gavia pacifica</i>
<b>Tundra Swan</b> - <i>Cygnus columbianus</i>	<b>Common Loon</b> - <i>Gavia immer</i>
<b>Wood Duck</b> - <i>Aix sponsa</i>	<b>Yellow-billed Loon</b> - <i>Gavia adamsii</i>
<b>Gadwall</b> - <i>Anas strepera</i>	<b>Pied-billed Grebe</b> - <i>Podilymbus podiceps</i>
<b>American Wigeon</b> - <i>Anas americana</i>	<b>Horned Grebe</b> - <i>Podiceps auritus</i>
<b>Mallard</b> - <i>Anas platyrhynchos</i> *	<b>Red-necked Grebe</b> - <i>Podiceps grisegena</i>
<b>Cinnamon Teal</b> - <i>Anas cyanoptera</i>	<b>Eared Grebe</b> - <i>Podiceps nigricollis</i>
<b>Northern Shoveler</b> - <i>Anas clypeata</i>	<b>Western Grebe</b> - <i>Aechmophorus occidentalis</i>
<b>Northern Pintail</b> - <i>Anas acuta</i>	<b>Clark's Grebe</b> - <i>Aechmophorus clarkii</i>
<b>Green-winged Teal</b> - <i>Anas crecca</i>	<b>American White Pelican</b> - <i>Pelecanus erythrorhynchos</i>
<b>Canvasback</b> - <i>Aythya valisineria</i>	<b>Double-crested Cormorant</b> - <i>Phalacrocorax auritus</i>
<b>Redhead</b> - <i>Aythya americana</i>	<b>American Bittern</b> - <i>Botaurus lentiginosus</i>
<b>Ring-necked Duck</b> - <i>Aythya collaris</i>	<b>Great Blue Heron</b> - <i>Ardea herodias</i>
<b>Greater Scaup</b> - <i>Aythya marila</i>	<b>Great Egret</b> - <i>Ardea alba</i>
<b>Lesser Scaup</b> - <i>Aythya affinis</i>	<b>Snowy Egret</b> - <i>Egretta thula</i>
<b>Bufflehead</b> - <i>Bucephala albeola</i>	<b>Green Heron</b> - <i>Butorides virescens</i>
<b>Common Goldeneye</b> - <i>Bucephala clangula</i>	<b>Black-crowned Night-Heron</b> - <i>Nycticorax nycticorax</i>
<b>Hooded Merganser</b> - <i>Lophodytes cucullatus</i>	<b>White-faced Ibis</b> - <i>Plegadis chihii</i>
<b>Common Merganser</b> - <i>Mergus merganser</i> *	<b>Turkey Vulture</b> - <i>Cathartes aura</i>
<b>Red-breasted Merganser</b> - <i>Mergus serrator</i>	<b>Osprey</b> - <i>Pandion haliaetus</i> *
<b>Ruddy Duck</b> - <i>Oxyura jamaicensis</i>	<b>Bald Eagle</b> - <i>Haliaeetus leucocephalus</i> *
<b>Sooty Grouse</b> - <i>Dendragapus fuliginosus</i> *	<b>Northern Harrier</b> - <i>Circus cyaneus</i>

Sharp-shinned Hawk - *Accipiter striatus*\*  
Cooper's Hawk - *Accipiter cooperii*\*  
Northern Goshawk - *Accipiter gentilis*\*  
Red-shouldered Hawk - *Buteo lineatus*  
Red-tailed Hawk - *Buteo jamaicensis*\*  
Rough-legged Hawk - *Buteo lagopus*  
Golden Eagle - *Aquila chrysaetos*  
American Kestrel - *Falco sparverius*\*  
Merlin - *Falco columbarius*  
Peregrine Falcon - *Falco peregrinus*  
Prairie Falcon - *Falco mexicanus*  
Virginia Rail - *Rallus limicola*\*  
Sora - *Porzana carolina*\*  
American Coot - *Fulica americana*  
Snowy Plover - *Charadrius alexandrinus*  
Semipalmated Plover - *Charadrius semipalmatus*  
Killdeer - *Charadrius vociferous*\*  
Black-necked Stilt - *Himantopus mexicanus*  
American Avocet - *Recurvirostra americana*  
Greater Yellowlegs - *Tringa melanoleuca*  
Willet - *Caotrophorus semipalmatus*  
Spotted Sandpiper - *Actitis macularius*\*  
Long-billed Curlew - *Numenius americanus*  
Marbled Godwit - *Limosa fedoa*  
Sanderling - *Calidris alba*  
Western Sandpiper - *Calidris mauri*  
Least Sandpiper - *Calidris minutilla*  
Baird's Sandpiper - *Calidris bairdii*  
Pectoral Sandpiper - *Calidris melanotos*  
Dunlin - *Calidris alpina*  
Short-billed Dowitcher - *Limnodromus griseus*

Long-billed Dowitcher - *Limnodromus scolopaceus*  
Wilson's Snipe - *Gallinago delicata*\*  
Wilson's Phalarope - *Phalaropus tricolor*  
Red-necked Phalarope - *Phalaropus lobatus*  
Parasitic Jaeger - *Stercorarius parasiticus*  
Long-tailed Jaeger - *Stercorarius longicaudus*  
Bonaparte's Gull - *Larus philadelphia*  
Ring-billed Gull - *Larus delawarensis*  
California Gull - *Larus californicus*  
Herring Gull - *Larus argentatus*  
Sabine's Gull - *Xema sabini*  
Caspian Tern - *Sterna caspia*  
Common Tern - *Sterna hirundo*  
Arctic Tern - *Sterna paradisaea*  
Forster's Tern - *Sterna forsteri*  
Black Tern - *Chlidonias niger*  
Rock Pigeon - *Columba livia*\*  
Band-tailed Pigeon - *Patagioenas fasciata*\*  
Mourning Dove - *Zenaida macroura*\*  
Flammulated Owl - *Otus flammeolus*\*  
Western Screech-Owl - *Megascops kennicottii*  
Great Horned Owl - *Bubo virginianus*\*  
Northern Pygmy-Owl - *Glaucidium gnoma*\*  
Spotted Owl - *Strix occidentalis*  
Long-eared Owl - *Asio otus*\*  
Northern Saw-whet Owl - *Aegolius acadicus*\*  
Common Nighthawk - *Chordeiles minor*\*  
Common Poorwill - *Phalaenoptilus nuttallii*\*  
Vaux's Swift - *Chaetura vauxi*  
Anna's Hummingbird - *Calypte anna*  
Calliope Hummingbird - *Stellula calliope*\*



Broad-tailed Hummingbird - *Selasphorus platycercus*\*  
 Rufous Hummingbird - *Selasphorus rufus*  
 Belled Kingfisher - *Ceryle alcyon*\*  
 Lewis's Woodpecker - *Melanerpes lewis*\*  
 Acorn Woodpecker - *Melanerpes formicivorus*  
 Williamson's Sapsucker - *Sphyrapicus thyroideus*\*  
 Red-naped Sapsucker - *Sphyrapicus nuchalis*  
 Red-breasted Sapsucker - *Sphyrapicus ruber*\*  
 Downy Woodpecker - *Picoides pubescens*\*  
 Hairy Woodpecker - *Picoides villosus*\*  
 White-headed Woodpecker - *Picoides albolarvatus*\*  
 Black-backed Woodpecker - *Picoides arcticus*\*  
 Northern Flicker - *Colaptes auratus*\*  
 Pileated Woodpecker - *Dryocopus pileatus*\*  
 Olive-sided Flycatcher - *Contopus cooperi*\*  
 Western Wood-Pewee - *Contopus sordidulus*\*  
 Willow Flycatcher - *Empidonax traillii*  
 Hammond's Flycatcher - *Empidonax hammondi*  
 Gray Flycatcher - *Empidonax wrightii*  
 Dusky Flycatcher - *Empidonax oberholseri*\*  
 Pacific-slope Flycatcher - *Empidonax difficilis*  
 Cordilleran Flycatcher - *Empidonax occidentalis*  
 Black Phoebe - *Sayornis nigricans*  
 Say's Phoebe - *Sayornis saya*  
 Western Kingbird - *Tyrannus verticalis*  
 Plumbeous Vireo - *Vireo plumbeus*\*  
 Cassin's Vireo - *Vireo cassinii*\*  
 Warbling Vireo - *Vireo gilvus*\*  
 Steller's Jay - *Cyanocitta stelleri*\*  
 Blue Jay - *Cyanocitta cristata*  
 Western Scrub-Jay - *Aphelocoma californica*

Piñon Jay - *Gymnorhinus cyanocephalus*  
 Clark's Nutcracker - *Nucifraga columbiana*\*  
 Black-billed Magpie - *Pica pica*  
 American Crow - *Corvus brachyrhynchos*  
 Common Raven - *Corvus corax*\*  
 Horned Lark - *Eremophila alpestris*  
 Tree Swallow - *Tachycineta bicolor*\*  
 Violet-green Swallow - *Tachycineta thalassina*  
 Northern Rough-winged Swallow - *Stelgidopteryx serripennis*  
 Bank Swallow - *Riparia riparia*  
 Cliff Swallow - *Petrochelidon pyrrhonora*\*  
 Barn Swallow - *Hirundo rustica*\*  
 Mountain Chickadee - *Poecile gambeli*\*  
 Bush-tit - *Psaltriparus minimus*\*  
 Red-breasted Nuthatch - *Sitta canadensis*\*  
 White-breasted Nuthatch - *Sitta carolinensis*\*  
 Pygmy Nuthatch - *Sitta pygmaea*\*  
 Brown Creeper - *Certhia americana*\*  
 Rock Wren - *Salspinctes obsoletus*\*  
 Canyon Wren - *Catherpes mexicanus*  
 Bewick's Wren - *Thryomanes bewickii*  
 House Wren - *Troglodytes aedon*\*  
 Winter Wren - *Troglodytes troglodytes*  
 Marsh Wren - *Cistothorus palustris*  
 Golden-crowned Kinglet - *Regulus satrapa*\*  
 Ruby-crowned Kinglet - *Regulus calendula*\*  
 Blue-gray Gnatcatcher - *Poliopitila caerulea*  
 Western Bluebird - *Sialia mexicana*\*  
 Mountain Bluebird - *Sialia currucoides*\*  
 Townsend's Solitaire - *Myadestes townsendi*\*

Swainson's Thrush - *Catharus ustulatus*\*  
 Hermit Thrush - *Catharus guttatus*\*  
 American Robin - *Turdus migratorius*\*  
 Varied Thrush - *Ixoreus naevius*  
 European Starling - *Sturnus vulgaris*\*  
 American Pipit - *Anthus rubescens*  
 Cedar Waxwing - *Bombycilla cedrorum*  
 Orange-crowned Warbler - *Vermivora celata*  
 Nashville Warbler - *Vermivora ruficapilla*\*  
 Virginia's Warbler - *Vermivora virginiae*  
 Yellow Warbler - *Dendroica petechia*\*  
 Black-throated Blue Warbler - *Dendroica caerulescens*  
 Yellow-rumped Warbler - *Dendroica coronata*\*  
 Black-throated Gray Warbler - *Dendroica nigrescens*  
 Townsend's Warbler - *Dendroica townsendi*  
 Hermit Warbler - *Dendroica occidentalis*  
 Black-and-white Warbler - *Mniotilta varia*  
 Prothonotary Warbler - *Protonotaria citrea*  
 MacGillivray's Warbler - *Oporornis tolmiei*\*  
 Common Yellowthroat - *Geothlypis trichas*  
 Wilson's Warbler - *Wilsonia pusilla*\*  
 Western Tanager - *Piranga ludoviciana*\*  
 Green-tailed Towhee - *Pipilo chlorurus*\*  
 Spotted Towhee - *Pipilo maculatus*\*  
 Chipping Sparrow - *Spizella passerina*\*  
 Brewer's Sparrow - *Spizella breweri*\*  
 Black-chinned Sparrow - *Spizella atrogularis*  
 Vesper Sparrow - *Pooecetes gramineus*\*  
 Lark Sparrow - *Chondestes grammacus*

Black-throated Sparrow - *Amphispiza bilineata*  
 Sage Sparrow - *Amphispiza belli*  
 Savannah Sparrow - *Passerculus sandwichensis*\*  
 Fox Sparrow - *Passerella iliaca*\*  
 Song Sparrow - *Melospiza melodia*\*  
 Lincoln's Sparrow - *Melospiza lincolni*\*  
 White-crowned Sparrow - *Zonotrichia leucophrys*\*  
 Golden-crowned Sparrow - *Zonotrichia atricapilla*  
 Dark-eyed Junco - *Junco hyemalis*\*  
 Rose-breasted Grosbeak - *Pheucticus ludovicianus*  
 Black-headed Grosbeak - *Pheucticus melanocephalus*\*  
 Lazuli Bunting - *Passerina amoena*\*  
 Red-winged Blackbird - *Agelaius phoeniceus*\*  
 Western Meadowlark - *Sturnella neglecta*  
 Yellow-headed Blackbird - *Xanthocephalus xanthocephalus*  
 Brewer's Blackbird - *Euphagus cyanocephalus*\*  
 Brown-headed Cowbird - *Molothrus ater*\*  
 Gray-crowned Rosy-Finch - *Leucosticte tephrocotis*  
 Pine Grosbeak - *Pinicola enucleator*\*  
 Purple Finch - *Carpodacus purpureus*  
 Cassin's Finch - *Carpodacus cassinii*\*  
 House Finch - *Carpodacus mexicanus*\*  
 Red Crossbill - *Loxia curvirostra*\*  
 Pine Siskin - *Carduelis pinus*\*  
 Lesser Goldfinch - *Carduelis psaltria*\*  
 American Goldfinch - *Carduelis tristis*  
 Evening Grosbeak - *Coccothraustes vespertinus*\*  
 House Sparrow - *Passer domesticus*\*