

THE SUMMER RESIDENT BIRDS OF THE BOREAL AND
TRANSITION LIFE-ZONES OF MOUNT PINOS,
CALIFORNIA

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Mount Pinos, lying at the southern end of the San Joaquin Valley, California, is separated from the Sierra Nevada to the northeast and the San Gabriel Mountains to the southeast by low passes not exceeding 4200 feet in elevation. The summit of the mountain rises to an elevation of 8826 feet. From the San Gabriel range southward through southern California, the mountain chain is continued, in order, by the San Bernardino, San Jacinto, Santa Rosa, and Cuyamaca mountains, each range being isolated by passes or by mountains of lower elevation. The Boreal and Transition life-zones of Mount Pinos encircle the summit, while below approximately the 6000-foot level are extensive areas of Upper and Lower Sonoran zones.

Grinnell (*Auk*, 22, 1905, pp. 378-391) has listed the birds encountered on Mount Pinos during a field trip conducted in June and July, 1904. Later, this list was used in a comparison of the numbers of Boreal and high Transition species occurring upon the summits of the various mountain peaks and ranges of southern California (Grinnell and Swarth, *Univ. Calif. Publ. Zool.*, 10, pp. 383-392). Since the appearance of these lists several additional Boreal and Transition species have been noted during the breeding season on Mount Pinos and are to be given formal mention at the present time.

Field work on Mount Pinos has been undertaken by the present authors as follows: May 27 to 31, 1922, May 29 to 31, 1924, May 28 to June 1, 1926, May 27 to 30, 1927, and July 8 to 11, 1929, by the senior author; and May 24 to June 15 and July 1 to 3, 1929, by the junior author. Acknowledgment is due to Mr. A. J. van Rossem for contributing field notes accumulated by himself in the course of a number of field trips to the Mount Pinos region during the past ten years.

Cryptoglaux acadica. Saw-whet Owl. A foot and feathers of this owl, no. 54139, *Mus. Vert. Zool.*, were found May 29, 1929, on a fallen log among yellow pines in a ravine on the eastern slope of the mountain, elevation 7800 feet. The fresh condition of the meat clinging to the bones indicated that the bird had been killed so recently as the preceding night.

Sphyrapicus varius daggetti. Sierra Nevada Red-breasted Sapsucker. Observed in May, 1924, on the southeast side of the mountain at about 6500 feet elevation. Later, a nest of young was found in the same vicinity by Laurence and Sidney Peyton. A few other individuals were seen during the late spring of the years 1924, 1926, and 1927.

Empidonax wrightii. Wright Flycatcher. Common summer resident, breeding in the ceanothus brush from 6500 feet elevation to near the summit of the mountain. A nest and a set of three fresh eggs were taken May 31, 1922, when also the parent birds were taken and identified by Mr. A. J. van Rossem. A breeding male, no. 54146, *Mus. Vert. Zool.*, was collected June 11, 1929, in a patch of ceanothus at 8100 feet elevation. It also was identified by van Rossem.

Sitta canadensis. Red-breasted Nuthatch. A juvenile, no. 570, coll. A. H. Miller, was shot from a small group of the same species on July 10, 1929, in the fir timber on the north slope of the mountain, elevation 7500 feet. It seems certain that the individual taken was reared somewhere on the mountain.

Hylocichla guttata sequoiensis. Sierra Nevada Hermit Thrush. First observed by A. J. van Rossem in May, 1923. On June 10, 1929, and on several succeeding days, a Hermit Thrush was heard singing by van Rossem and the junior author in the fir timber. A bird was seen and heard in the same vicinity June 13, 1929.

Myadestes townsendi. Townsend Solitaire. A pair was seen June 8, 1929, on a rocky ridge on the steep north slope of the mountain at 8000 feet elevation. One of the pair was collected and proved to be an adult male, no. 54159, Mus. Vert. Zool., in breeding condition.

Regulus satrapa olivaceus. Western Golden-crowned Kinglet. Observed on the mountain wherever fir trees occurred. Between June 6 and June 13, 1929, these kinglets were seen daily. They were found in pairs and the enlarged gonads indicated that the breeding season was in progress. An adult, no. 54161, Mus. Vert. Zool., was collected June 6, 1929, and van Rossem obtained an adult male June 10, 1929. Also observed July 10, 1929, in the fir timber on the north slope, elevation 7500 feet.

Corthylio calendula cineraceus. Western Ruby-crowned Kinglet. First observed June 9, 1929, in fir timber on the north slope of the mountain, and heard and seen on succeeding days up to June 13. The birds were in full song. They were less numerous than the Golden-crowned Kinglets.

Of the list of thirty-one Boreal and high Transition species of birds given by Grinnell and Swarth (*loc. cit.*) as summer residents of the southern Sierra Nevada, with the above additions twenty-four are now known to occur on Mount Pinos whereas only seventeen were listed previously. (See accompanying table.) *Cryptoglaux* was not included in the list of thirty-one, but nevertheless is an interesting addition to the known Transition fauna.

In view of the thoroughgoing surveys conducted in the San Bernardino, San Jacinto, and Santa Rosa mountains, it seems likely that few, if any, more of these thirty-one species will be added to the present faunal lists of these mountain ranges. However, there is reason to expect that intensive work in the San Gabriel Mountains, which has been lacking to date, might increase the list from that mountain mass. Consequently, in the following comparisons of lists of species some reservation is felt concerning the San Gabriel Mountains, particularly in view of the degree to which the Mount Pinos list has been increased.

Mountain ranges in order of size of Boreal area	Mountain ranges in order of number of species of Boreal birds
Southern Sierra Nevada	Southern Sierra Nevada, 31 species
San Bernardino Mts.	San Bernardino Mts., 28 species
San Jacinto Mts.	Mt. Pinos, 24 species
San Gabriel Mts.	San Jacinto Mts., 22 species
Mt. Pinos	San Gabriel Mts., 17 species
Santa Rosa Mts.	Santa Rosa Mts., 11 species
Cuyamaca Mts.	Cuyamaca Mts., 7 species

Grinnell and Swarth postulated (*loc. cit.*) that the smaller the disconnected area of a given zone (or distribution area of any rank) the fewer the types which are persistent therein. This principle is well founded and widely applicable. However, another factor, namely, the relative proximity of detached faunal areas to the main or central area, may also be an active agent in influencing the composition of detached faunas. Working with the evidence available at the time, Grinnell and Swarth placed little importance upon this latter principle as operating in the southern California mountains. In dealing with birds we may suppose that the isolation of these southern California mountain ranges is not complete during the non-breeding season, albeit complete during spring and early summer. Isolation of disconnected areas, therefore, must to all intents be absolute before the factor of distance of disconnected area from the main faunal area can be entirely eliminated. To account for the large number of Boreal species on Mount Pinos we would resort to the explanation that Mount Pinos from time to time is restocked from the Boreal popu-

TABLE MODIFIED FROM THAT OF GRINNELL AND SWARTH SHOWING RELATIVE NUMBERS OF BOREAL AND HIGH TRANSITION BIRDS REPRESENTED ON THE DIFFERENT MOUNTAIN MASSES OF SOUTHERN CALIFORNIA

	Southern Sierra Nevada	Mt. Pinos-	San Gabriel Mts.	San Bernardino Mts.	San Jacinto Mts.	Santa Rosa Mts.	Cuyamaca Mts.
<i>Dendragapus obscurus howardi</i>	x	x	—	—	—	—	—
<i>Otus flammeolus flammeolus</i>	x	—	—	x	—	—	—
<i>Stellula calliope</i>	x	x	x	x	x	—	—
<i>Xenopicus albolarvatus albolarvatus</i>	x	x	—	—	—	—	—
<i>Xenopicus albolarvatus gravirostris</i>	—	—	x	x	x	x	x
<i>Sphyrapicus varius daggetti</i>	x	x	—	x	x	—	—
<i>Sphyrapicus thyroideus</i>	x	—	—	x	x	—	—
<i>Chordeiles virginianus hesperis</i>	x	—	—	x	—	—	—
<i>Empidonax wrightii</i>	x	x	x	x	x	x	—
<i>Nuttallornis mesoleucus majorinus</i>	x	x	x	x	x	x	x
<i>Cyanocitta stelleri frontalis</i>	x	x	x	x	x	x	x
<i>Nucifraga columbiana</i>	x	x	x	x	x	x	—
<i>Penthestes gambeli baileyi</i>	x	x	x	x	x	x	x
<i>Sitta canadensis</i>	x	x	—	x	x	—	—
<i>Sitta pygmaea melanotis</i>	x	x	x	x	—	—	—
<i>Sitta pygmaea leuconucha</i>	—	—	—	—	x	x	x
<i>Certhia familiaris zelotes</i>	x	x	x	x	x	x	x
<i>Turdus migratorius propinquis</i>	x	x	x	x	—	—	—
<i>Hylocichla guttata sequoiensis</i>	x	x	—	x	—	—	—
<i>Sialia currucoides</i>	x	—	—	x	—	—	—
<i>Myadestes townsendi</i>	x	x	—	x	—	—	—
<i>Regulus satrapa olivaceus</i>	x	x	—	x	x	—	—
<i>Corthylio calendula cineraceus</i>	x	x	x	x	x	—	—
<i>Dendroica auduboni auduboni</i>	x	x	x	x	x	x	—
<i>Carpodacus cassinii</i>	x	x	x	x	x	—	—
<i>Leucosticte tephrocotis dawsoni</i>	x	—	—	—	—	—	—
<i>Spinus pinus pinus</i>	x	x	x	x	x	x	—
<i>Loxia curvirostra bendirei</i>	x	x	—	x	x	—	—
<i>Oberholseria chlorura</i>	x	x	x	x	x	—	—
<i>Junco oreganus thurberi</i>	x	x	x	x	x	x	x
<i>Zonotrichia leucophrys leucophrys</i>	x	—	—	—	—	—	—
<i>Passerella iliaca stephensi</i>	x	x	x	x	x	—	—
<i>Melospiza lincolni lincolni</i>	x	—	—	x	x	—	—
	31	24	17	28	22	11	7

lations in the southern Sierra Nevada. It should be noted that of all the major southern California mountains Mount Pinos is the closest to the main Sierran reservoir of Boreal populations. The catastrophes which might befall small separated populations on Mount Pinos would thus be compensated through relatively ready repopulation. This repopulation may be frequent only in the sense of geologic time intervals, or may occur every few years, dependent upon the vastly different conditions affecting the different species.

It should be noted that wherever subspecies occur in the Boreal species under consideration, in no case does the dividing line between subspecies pass between Mount Pinos and the southern Sierra Nevada. Thus, *Xenopicus albolarvatus albolarvatus* and *Sitta pygmaea melanotis*, both northern races, are found in the Sierra Nevada and on Mount Pinos. *Dendragapus obscurus howardi*, *Passerella iliaca stephensi*, and *Penthestes gambeli baileyi* range as far north as southern Tulare County. Although specimens of these five species from the southern Sierra Nevada and Mount Pinos may show differences, in no case are such differences currently recognized as of subspecific value. This fact alone suggests a shifting or movement of populations sufficient occasionally to dilute any incipient subspecific divergence that might appear in a Mount Pinos population. In other species exhibiting no such slight differences, repopulation probably occurs more often, as for example, the Solitaire, Hermit Thrush, Red-breasted Nuthatch, Kinglets, Robin, etc., this group being characterized by a greater tendency to migrate and invade new territory than is to be seen in the case of the Grouse, Pigmy Nuthatch, or White-headed Woodpecker.

The possibility of repopulation of the mountain areas south of Mount Pinos, in general, must diminish inversely as the square of the distance from the Sierra Nevada. On the other hand, the spreading of populations would tend to concen-

trate along the chain of mountains rather than take place uniformly in all directions, thus materially increasing chances for repopulation, estimated on the basis of mathematical probability alone. Judging from the available lists of species, repopulation from the Sierra Boreal zone in most instances is of minor importance in the mountains south of Mount Pinos. However, the large San Bernardino Boreal zone may serve to replenish Boreal populations in the adjacent San Gabriel and San Jacinto mountains. The San Jacinto Mountains in turn may occasionally serve to repopulate the small area in the Santa Rosa Mountains. Nevertheless, it should be noted that the Pigmy Nuthatches in the San Bernardino Mountains and San Jacinto Mountains are considered as subspecifically distinct.

Mammals, being a far less mobile group than birds, are relatively well isolated in the various mountains under consideration. Chances for repopulation from the Sierra region are relatively slight. Consequently, Boreal mammals on Mount Pinos are few and correspond closely in numbers to the small size of the area.

Lastly, it should be emphasized that the above discussion only deals with average effects upon distribution. Ideally, the problem of persistence and maintenance of isolated populations should be solved for each species separately. Better than a zonal classification of species would be an analysis of smaller faunal associations; for it is likely that some of the species do not exist in the smaller areas because there is no place for them. Nevertheless, lacking data for such a detailed analysis, consideration of the foregoing generalizations seems justified.

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