

FIRE AND BIRD POPULATIONS

By HAROLD W. CLARK

From August 22 to 29, 1931, a severe forest and brush fire swept over Howell Mountain in Napa County, California, spreading eastward to Chiles Valley and northward beyond Middletown, Lake County. Thousands of acres of chaparral, blue oak, yellow pine, and Douglas fir were destroyed. The humidity was low, and everything burned with intense heat, even to the humus of the soil in many places. The heat killed most of the tall trees within the burned area, in many cases drying them out so that they caught up the flames and carried them aloft in fierce crown fires. There was a moderate breeze most of the time, blowing first from one direction and then from another. At no time, however, was the wind strong. The fire ran night and day, in some instances burning fiercely up steep slopes during the night and raging beyond control during the daytime.

The effect of this fire upon the bird life of the region affected has been a matter of considerable interest to me, and the following observations are from notes taken during the fire and at intervals since.

On the east side of the mountain was a heavy growth of tan oak, redwood and Douglas fir, at an elevation of about 1600 feet. During the morning of August 27, while I was patrolling a backfire line, a heavy fire was running through the timber on the hillside a hundred yards below me. Occasionally it would run up into the tops of the trees, making a solid wall of flame a hundred or more feet high. At this time I noticed several small birds flying rapidly through the woods, keeping well ahead of the fire as it drove them up the hill.

On the west side of the mountain, near St. Helena, the fire ran into a mass of chaparral and blue-oak woodland. One fire-fighter reported to me that he saw several Mountain Quail in flight. Sometimes they became confused and circled back into the blaze. Some were seen to burn in the flames. These were not the only creatures doing this, for jack-rabbits were seen running about excitedly and occasionally going back into the fire. On the east side I saw a deer which was apparently crazed by the smoke. He dashed out of the brush above the fire line, crashed into a tree, swerved, looked about wildly, and went smashing off into the burned brush.

One observer reported to me that he saw a small owl, either a Pigmy Owl or a Screech Owl, attack a wood rat that was running before the fire. The smoke was so dense that it was nearly dark and almost impossible to tell from which direction the fire was approaching. Instead of trying to escape, the owl tried again and again to catch the rat, but eventually failed, the rat escaping into the brush.

The burned area remained a barren waste until the heavy rain in the middle of October started grass growing. On October 31, in company with three other bird students, I went over the rough mountainous area to the northwest of Angwin. In many places the hillsides were completely denuded. In others the trees were killed but not burned. In a few sheltered locations a few firs or manzanitas remained unscarred by the fire. On the open grassy slopes grass was appearing, but under the trees, where annual grasses did not grow normally, there was only bare earth. Along the bottom of Bell's Canyon the alders seemed to be almost untouched by the flames, and looked as much alive as ever.

Flickers were fairly common, and seemed to find the effects of the fire to their advantage, as the insects were already apparent in the dead trees. One or two individuals of the Hairy Woodpecker were seen on the branches of a fire-killed oak.

Western Bluebirds flew over in small flocks, but did not stop except in small

areas where live trees still remained. The Thurber Junco was plentiful wherever there were any live trees. Three or four flocks of Bush-tits were also seen foraging about bits of green in trees. One Golden-crowned Sparrow sang from a thicket, but whether there was any green left or not, we could not make out. A Wren-tit was heard singing in what was left of a chaparral thicket.

On April 16, 1932, I went over a portion of Bell's Canyon two miles west of Angwin. A few black oaks and manzanitas survived the fire, and along the creek at the bottom of the canyon the alders and streamside shrubs were unharmed. The burned area was a mass of bloom. Many wild flowers had sprung up in profusion. Apparently the removing of the cover of brush had given them a better chance than usual.

Birds were scarce over the area traversed. A few Bush-tits were seen. Green-backed Goldfinches were the most abundant, supposedly because of the prevalence of seed-bearing plants. A few Western Bluebirds were seen. Audubon and Lutescent warblers were also noted as common along the creek, where the Cassin and Warbling vireos seemed as thick as usual.

On May 8, 1932, I attended a picnic at a ranch three miles north of Angwin, where the hills were formerly covered with black oak, manzanita, and some Douglas fir. Big-leaf maple grew by a spring near-by. Near the ranch buildings the fire had not disturbed the larger trees to any great extent, and the usual assemblage of warblers, vireos, and linnets was heard.

My home is located on a partly open hilltop a few hundred yards back of the campus of Pacific Union College, and is surrounded by thickets of blackberry, grape, manzanita, roses, lilac, and coyote brush (*Baccharis pilularis*). Ordinarily about three families of the Western House Wren occupy the territory in the immediate vicinity of my home. The spring after the fire one or two extra families crowded into the territory. In the woods near-by the Cassin Vireo and Western Warbling Vireo were more noticeable than usual, and about the campus of the college the vireos and the Pacific Black-headed Grosbeak were the subject of comment by even casual observers on account of their unusual abundance.

Thinking that perhaps our observations were merely concomitant with an increased interest in the problem of their sustenance, and that our impressions were due to our expectation of an increased local population, I gave careful attention to the density of the bird population during the springs of 1933 and of 1934. In both cases the birds mentioned were back to practically their original status. Vireos were heard only scatteringly, as usual, and grosbeaks in considerably decreased numbers from what we noticed in 1932. The same number of wren families occupied the territory about my home as in years before the fire.

In correlating these conclusions with the changes in the burned area, field trips in the spring of 1934 showed that over a considerable portion of the country the oaks had sprouted new shoots, which were now from four to six feet high, and densely foliated. Alders and willows along the streams were as healthy as ever, having received little if any permanent damage. Many small shrubs had sprouted new growth. A heavy growth of herbaceous plants covered the ground. Except for areas formerly covered with manzanita or conifers, the vegetation appeared to be sufficient to give abundant forage to most birds.

The upset in the bird population over the mountain was apparently a temporary matter, and easily compensated for by a crowding of territories until conditions righted themselves. A few species would evidently have to find new territories. However, the changes incident to the fire would likely open up new areas for their settlement, to compensate for those lost. Such a readjustment could easily

be made in a season or two; in fact, that such was actually the case is borne out by the observation that as one walks through the burned area now, three years after the fire, he sees and hears about the same grouping of birds that he used to notice. Except for changes in location, the general population is about the same. This might not be true in a broad area where the vegetation type is uniform. In such a case the destruction of the plant life would change the environment so that an entirely new line-up of populations might occur. But in a rugged mountain area such as we have in the north coast ranges of California, the checkered arrangement of ecological areas makes a readjustment comparatively easy. Birds finding their accustomed habitats destroyed will not have far to go until they find other areas where either new growth of vegetation or replacement of old types will afford them their usual conditions of life.

In conclusion, I am led to speculate as to the relation ordinarily maintained between the bird population and the territory. If my observations are valid, they would seem to indicate that a crowding of bird populations may occur, at least temporarily. That raises the question as to whether under normal conditions the bird population in any given territory is at its saturation point, or whether other factors aside from the ability of the territory to support bird life may not at least be a contributing factor to the regulation of the populations. Anyway, the problem is one that will bear investigation.

Angwin, California, October 2, 1934.

THE THICK-BILLED PARROT IN SOUTHERN ARIZONA

By ALEXANDER WETMORE

In a recent number of the Condor (36, 1934, pp. 180-181) Professor Charles T. Vorhies has given interesting information on the latest known occurrence of the Thick-billed Parrot (*Rhynchopsitta pachyrhyncha*) in Arizona, to which I may be permitted to add some additional data. During June and July, 1919, I was engaged in field work in southern Arizona for the Bureau of Biological Survey and as a part of this work secured what information I could on parrots. In work in Pinery Canyon I was a guest in the camp of Mr. and Mrs. J. Eugene Law and subsequently placed my notes at Mr. Law's disposal, as he had planned a full account of the avifauna of the Chiricahua region. Illness prevented completion of this project and the data secured on parrots were not published, except that in reading the proof sheets of the fourth edition (1931) of the A. O. U. Check-list I added certain localities that extended the previously known range for these birds within our limits. The data that follow were obtained from reliable observers and were checked where possible by inquiry from different sources.

In Pinery Canyon, Thick-billed Parrots were observed by Mr. F. Hands on August 20, 1917. On this day he heard a strange noise and, stepping to the door identified it as the calling of parrots, a sound that he had heard in other years. To verify his identification he followed the sound and found six or eight of the birds feeding in a pine over a mile away. From this date the number of parrots in Pinery Canyon increased steadily until by September 1 about 300 were present. As cold weather came during the fall some of the birds disappeared. Others remained during the entire winter, although at one time the ground was covered by six inches of snow for over two weeks and the birds were forced to seek their food on the ground