The Status of Native Land Birds on Molokai, Hawaiian Islands

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MOLOKAI, the fifth largest of the Hawaiian Islands, is 38 miles long and about 10 miles wide. Its eastern half is high land running up to almost 5,000 feet in height. Some rather extensive areas of native forest still remain on the upper slopes, but introduced plants have displaced the native growth over large areas. In spite of the large area and the amount of cover, the rather intensive observations of the Hawaiian Bird Survey from 1935 to 1937 resulted in only a single record (Munro, 1944: 96) of a native land species on Molokai—the apapane (*Himatione sanguinea*). The survey covered large areas of native forest, chiefly in the east–central part of the island, where endemic birds had once been abundant. Munro thought he heard the song of the Molokai thrush (*Phaeornis obscura rutha*) in 1936 but was not certain. Richards (1946: 29) probably saw amakihis (*Chlorodrepanis virens wilsoni*), but this too is uncertain. Bryan (1908) was apparently the last ornithologist to observe and collect various native birds that have since become extinct or nearly extinct. He saw Perkins' mamo (*Drepanis funerea*), the crested honeyeater (*Palmeria dolei*), the Molokai creeper (*Paroreomyza maculata flammea*), and other native birds. Certain species, such as the ou (*Psittacirostra psittacea*) and the oo (*Acrulocercus bishopi*), were almost certainly extinct even then.

The survey of 1935–1937 appeared to indicate that nearly all native birds formerly found on Molokai were extinct. However, the survey did not cover certain parts of the island, especially isolated canyons and highlands on the northeast side. Consequently, David Woodside and I undertook a visit to this little-frequented region. Our chief purpose was to observe birds on Olokui Mountain, which towers over 4,600 feet above and east of Pelekunu Valley which was a favorite collecting area of the fabulously successful collectors of the late nineteenth century. Bryan, as far as we could determine, was the only ornithologist who had been up on Olokui, and he probably covered only a small part of it. We hoped that the mountain, because of its great encircling cliffs and the bordering, deeply cut Pelekunu and Wailau Valleys, had escaped most human influences and that native birds which had long since disappeared from other parts of Molokai might have survived there. Munro, who is more familiar than anyone else with Molokai birds, repeatedly mentions (1944) Olokui as the last possible refuge for endemic birds on Molokai.

Mr. Woodside and I, with Harold St. John and two botanical assistants, landed at the mouth of Wailau Valley on February 2, 1948. The next day we followed the seaward ridge of Olokui (Fig. 1), and ascended the mountain to a height of about 3,000 feet, cutting our way through the thick plant growth above approximately 1,500 feet. We established a base camp at 3,000 feet, and during the next 3 days made trips into the canyons on the east side of Olokui to within half a mile of its top. After descending the mountain we crossed the island by hiking up Wailau Valley, climbed the steep south wall to its 3,000-foot rim, and then made the more gradual descent to Mapulehu.

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We saw only two species of native birds on Olokui — the apapane and the amakihi — but their abundance was noteworthy. Although we covered probably less than 3 linear miles, we saw well over 100 apapanes. A few of these were very likely "repeats," but pairing and territories, which would have led to seeing the same birds along the same route, were not detected. Groups of as many as five apapanes were seen. Some disappeared over Wailau Valley and others appeared to be flying to Olokui, which suggested the likely abundance of this species in the high native forest to the east of Wailau. Only five, or possibly eight, amakihis were seen, but all were found in the same region near the lower edge of the native forest. Individuals were seen here on both our ascent and descent of the mountain, which suggested a reasonable abundance of this species even though it is apparently restricted in range. One amakihi was collected for certain identification. It is interesting that Bryan (1908: 158, 162) considered the apapane the most numerous species in 1907 and the amakihi the second most numerous.

St. John considers the forest of Olokui as perhaps the finest unaltered native stand he has seen in the islands. The accompanying photographs (Figs. 1–4) record typical views of this forest. Several species of lobelia and the ohia lehua *(Metrosideros collina)*, the dominant tree, were blooming. The olapa *(Cheirodendron Gaudichaudii)* was another abundant tree species. However undisturbed the native forest may appear, and however suitable it may seem for several species of native birds other than those observed, it is certain that the vertebrate fauna has been greatly disturbed, presumably by introduced vertebrates. Two non-native bird species were present: the white-eye *(Zosterops palpebrosus japonicus)*, in an abundance probably only slightly less than that of the apapane, and the Chinese thrush *(Trochalopterum canorum)*, heard twice but seen only once. It appears that the apapane and amakihi have estab-

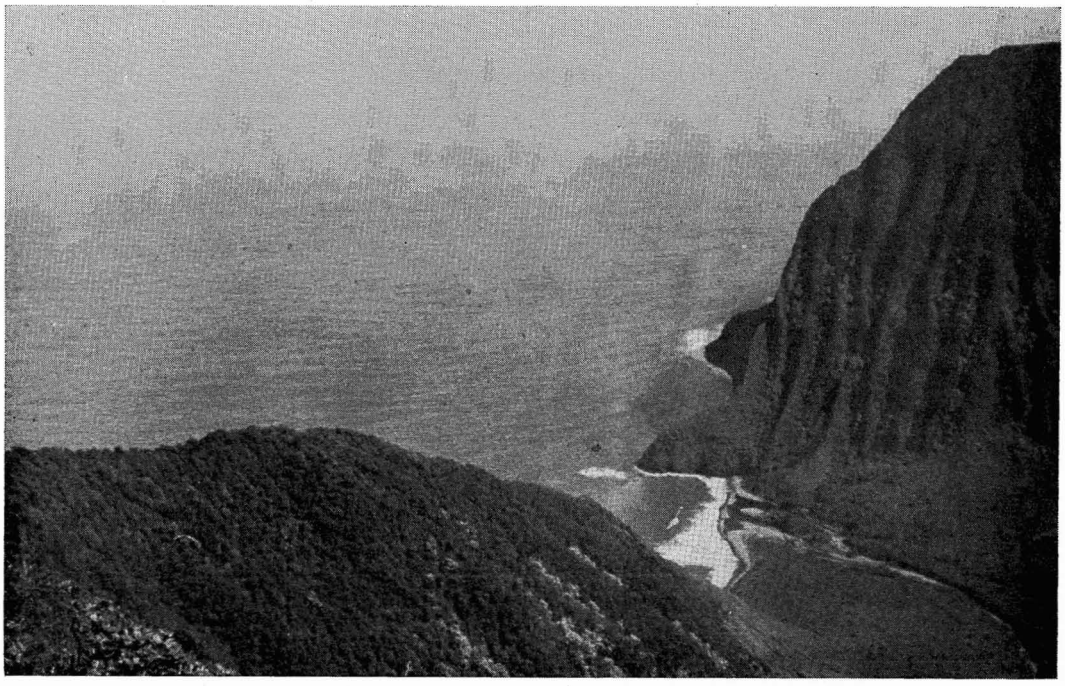

FIG. 1. View down northeast ridge of Olokui Mountain to mouth of Wailau Canyon. Trees in foreground are chiefly ohia lehua (*Metrosideros collina*) with light-colored kukui (*Aleurites moluccana*) interspersed below.

lished a balance with these alien species, but the possible effects of the non-native forms on species not now extant can only be conjectured.

Non-native mammals may well have altered the ornithological picture considerably. One mongoose (*Herpestes griseus*) was seen far up on Olokui, suggesting that the species, which is difficult to see in dense forest, is probably common. One rat seen high in a tree was collected and identified as *Rattus rattus alexandrinus*. Others had been eating the bananas of a small cluster of plants hidden in the native forest. Even in 1907 Bryan found evidence that the mongoose was decimating the population of the ground-nesting dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*). The rat may also be a serious enemy of ground-nesting birds and of many tree-nesting forms as well, since it is a good climber. Pellets of the Hawaiian owl (*Asio flammeus sandwichensis*) made up of rat remains were found at and below the lower edge of the native forest. This native predatory bird, which has been known in recent years from unforested parts of Molokai, could rarely if ever obtain rats in the dense native growth of most of the mountain. Goats, although abundant on the lower open canyon sides, have penetrated the native forest less than one-fourth of a mile. Undergrowth, especially of the uluhe fern (*Dicranopteris linearis*), seems to hinder their further ingress. The goat seen highest on the mountain was immediately below ohia lehua trees where we first observed apapanes and amakihis. Goats had not yet markedly altered the native trees at this elevation, although the lower vegetation was much changed.

Various native birds (white-tailed tropic bird, black-crowned night heron, wandering tattler, and golden plover) were seen in Wailau Valley, but no endemic passerines were observed. Introduced birds seen were the Chinese dove, the mynah, and the white-eye. Little native vegetation remains in the lower part of the canyon but good stands of native growth were encountered on the steep south wall. Apapanes and amakihis were again seen here as

FIG. 2. Forest on Olokui Mountain. Large-leaved tree at left is alani (*Pelea clusiaefolia*). Fern in foreground is okupukupu (*Nephrolepis exaltata*). Dr. Harold St. John in foreground.

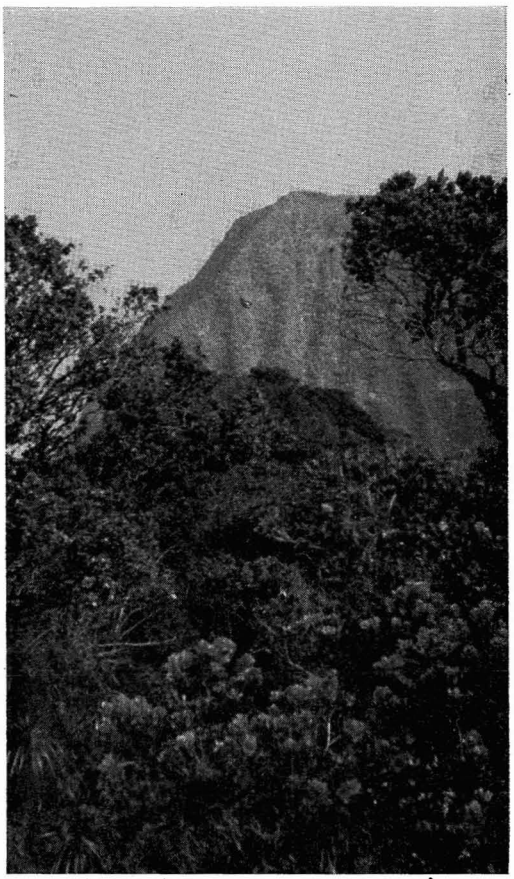

FIG. 3. Ohia lehua forest on Olokui looking across to east wall of Wailau Valley.

were white-eyes and a Pekin nightingale (*Leiothrix lutea*).

Even on Olokui our observations were not extensive enough to rule out the possibility of the existence of other native forest birds. The restricted area of rather uniform native habitat makes it seem likely that such birds, if they do exist, are very rare. However, the probably smaller number of individuals of tropical species and their not infrequently vagrant habits would necessitate a longer stay than ours before a reasonably sound conclusion could be reached. Woodside was almost certain he heard the song of an iiwi (*Vestería coccinea*) from the south wall of Wailau Valley, so this species should be sought with particular care in the future.

A striking change was evident in the vegetation on the south rim of Wailau Valley. The southeastern half of Molokai slopes relatively uniformly and not very steeply to the south. Remnants of native forest cover some of the higher areas and it was chiefly here that the Hawaiian Bird Survey was conducted. However, on the broad slopes down to Mapulehu and on large areas on each side of our route, the native forest has virtually disappeared. Dead or scraggly ohia lehua trees represent what was apparently the dominant forest. Grasses have taken over much of the now-open slopes.

No sign of native birds was seen during our descent from the rim of Wailau, and undoubt-

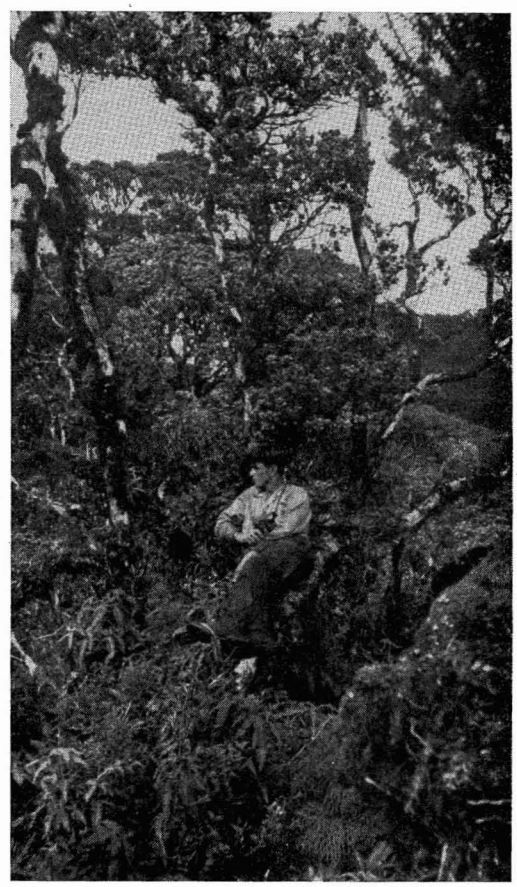

FIG. 4. Ohia lehua on Olokui. Fern at lower left is uluhe (*Dicranopteris linearis*). David Woodside in tree.

edly none was to be expected under such changed conditions. Bordering canyons appeared to have relatively unchanged native cover, and certain rather extensive high forested areas exist in the Kahanui region. As indicated by the absence of native birds on the Survey, much of the eastern half of Molokai seems to be so cut up by areas of altered forest conditions that such birds have disappeared.

Our cursory inspection of southeastern slopes of Molokai does not justify detailed analysis of the factors which have caused major forest changes. It seems clear, however, that the large introduced vertebrates have been the primary cause. Deer, cattle, and pigs range or have grazed over much of the region. Although they are most likely to occur in more open areas, the deer and cattle have penetrated the deep boggy type of native forest and also the less dense ohia lehua forest where the slopes have not been too steep.

Our observations on Molokai indicate that the remaining native forest birds are rather closely restricted to the northeast parts of the island where unaltered forest areas are most extensive and continuous. Olokui Mountain and the sides of Pelekunu and Wailau Valleys probably include the major part of the range of these native birds. In these regions there has been little or no penetration by large introduced mammals. It seems likely that the continued welfare of the remaining native birds rests in fair measure on not introducing these mammals into the parts of Molokai which they have not invaded. Pigs, deer, and cattle apparently do not now occur in Pelekunu and Wailau Valleys, but once in these valleys it seems apparent that they would work their way up the least precipitous slopes and irreparably alter the native forest.

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