

NOTES ON A MIGRATION OF *NYMPHALIS CALIFORNICA*

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During a trip to California this fall I was fortunate enough to observe one of the great migrations of *Nymphalis californica* Bdv. in a number of locations. While I did not attempt to make exact or extensive records, it occurs to me that my notes may be of value when combined with the data of others.

**Aug. 13, 1952, Richland, Wash.** While working on an insect community sample, in the middle of the extensive sagebrush semi-desert, one *Nymphalis* was observed to fly over the study area, moving toward the west, during 3½ hours of observation time.

**Aug. 13-15, Richland, Wash.** During 170 miles of road travel at 50 mph., three *Nymphalis* were observed flying across the road ahead of the car. Two of these flew across the road toward the west; one, however, crossed in the reverse direction. One-half of the three hours' observation time may perhaps be ruled out, since none were seen in the morning travel, 0700-0800, when they were presumably inactive. Since the *N. californica* seemed extraneous to the local sagebrush community, these indications of a migrant population, sparse as it was here, aroused my suspicions that we might be on the fringe of a major migration.

**Aug. 16, on the highway from Richland south to Biggs Junction and Bend, Ore.** Occasional individuals were seen along the road while in Washington in the morning, with population densities appearing to be of the same order as the very sparse migrant population at Richland. During the afternoon, while travelling south to Bend in the level lava and open pine forest country, it was observed that the frequency of the butterflies had much increased.

**Aug. 17, on the Bend-Klamath Falls highway east of Crater Lake.** In this area of fairly level terrain, Ponderosa and Lodgepole Pine forests, the density of the butterflies had so increased as to make the magnitude of the migration evident. A road count of *N. californica* seen crossing the road ahead of the car, close enough to be recognizable, was made for 5 miles travelling south at 50 mph. 90 *N. californica* were counted crossing toward the west, 9 back toward the east. The butterflies could often be seen caught in the eddies behind cars travelling in the opposite direction and observed on the radiators of older models, and many dead and stunned butterflies could be seen on the road.

**Aug. 17, Crater Lake National Park, afternoon.** Driving west from the main highway up to the Cascade Divide and Crater Lake the migrant population, already so dense outside the Park, increased to levels beyond anything I had ever seen. As one drove one butterfly after another would be carried up over the windshield or caught in the air currents around the car. Dead butterflies littered the road, wherever they had not been swept off by the eddies from passing cars, and the banks between the roads and ditches. Small windrows of *N. californica* had formed along the road in some places near the Park entrance where air currents from cars had swept the dead butterflies off the road and deposited them beside it.

One of the assistant park naturalists informed me that the migration had been in progress for three weeks and was already past its peak, and that it was his belief the butterflies were migrating up from the lower lands to the east into the Park to concentrate there, and die there. I had no chance to talk to Dr. RUHLE, Crater Lake Park Naturalist, but would urge anyone interested in the migration to write him; he probably has good notes on it.

**Aug. 17, on the rim of Crater Lake, early afternoon.** The *Nymphalis* were denser here than anywhere else I observed them. A ten-foot line was marked off on the lip of the rim overlooking the lake on the southeast side, perpendicular to the rim's circumference. In five minutes observation time, 98 *N. californica* crossed this ten-foot front flying toward the southwest, only 1 back toward the east. With a speed of flight that appeared to be around 5 mph, some rather staggering numbers of butterflies were necessary to maintain such a population in motion for a good many days over an extensive area.

**Aug. 18, Siskiyou Mountains of southwestern Oregon, in vicinity of Oregon Caves National Monument.** The *N. californica* were abundant in the Douglas fir-sclerophyll forests of these mountains; but no directional movement could be observed, and no count was felt feasible. I have spent parts of three summers in intensive field work in these mountains; the population observed Aug. 18 was far in excess of anything I had seen there previously.

**Aug. 18-20, south from the Siskiyou Mountains along the Redwood Highway and down the outer coast to San Francisco.** Decreasing numbers were seen in the mountains as we travelled out to the Coast. No *Nymphalis* were observed along the outer coast.

**Aug. 26-29, Yosemite and Kings Canyon National Parks.** Occasional *N. californica* were seen in the mountains, but not in numbers which seemed abnormal or suggested migration.

**Aug. 31, Strawberry Mountains, Ore.** The butterflies were observed to be common in the forests, without apparent directional trend in flight. A road count over 39 miles between John Day and Long Creek gave 12 individuals, 6 crossing the road from west to east, 4 from east to west, 2 in flight parallel to the road.

**Sept. 1-15, Richland, Wash.** Occasional *N. californica* were seen, their numbers being smaller than Aug. 7-15. I was told by an associate here that they were more numerous while I was gone than before or after my trip.

**Sept. 24, Richland, Wash.** The last *N. californica* seen crossed the sagebrush sampling area during the morning, in frantic and erratic flight as the abundant fall asilids of the desert rose, one after another, to try to intercept it, like so many pursuit planes after a bomber.

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