EFFECTS OF FLOODING ON THE MOUSE *PEROMYSCUS LEUCOPUS*

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ABSTRACT.—Marked individuals of *Peromyscus leucopus* apparently were eliminated in an area inundated by flooding. Re-invasion of the area after flooding was by unmarked individuals.

Layne (1958) has indicated that the white-footed mouse, *Peromyscus leucopus*, is abundant in southern Illinois bottomlands that may be partly or completely flooded at certain times of the year. Other authors, Stickel (1948) for example, also have attested to the large numbers of white-footed mice found in bottomlands. Enders (1930) noted that *P. leucopus* tolerates a greater range of moisture than any other rodent in Ohio; Nicholson (1941) and Wetzel (1958) suggested that the species copes with excessive moisture or standing water by living and nesting in trees; and swimming of white-footed mice has been reported (Teeters, 1954; Sheppe, 1965). Thus, judging from the literature, *P. leucopus* is tolerant of excessively moist conditions.

In 1963-1965, some effects of flooding on a population of white-footed mice in a wooded bottomland two-tenths mile southwest of the Carbondale City Reservoir in Jackson County, Illinois, were observed. In the course of trapping over a period of four months (19,858 trap-nights), from 18 May to 23 September 1963 (Turner and Stains, in manuscript), 90 white-footed mice were marked and released. Of these, 35 were known fatalities, leaving 55 marked mice on the area in September, 1963. None of these marked individuals was recaptured in a later trapping period, which began in June, 1964, and continued until May 1965 (80,622 trap-nights). In the early spring of 1964, prior to resumption of trapping, the study area was inundated. The population of *P. leucopus* in the second period of trapping was much reduced over that found in 1963. Although trapping was more extensive in 1964-65 (on about twice as large an area of bottomland and 60,764 more trap-nights than in 1963), only 93 white-footed mice were taken as compared to 90 in 1963. A small part of the breeding stock (27 mice) may have been eliminated by some snap-trapping, but extensive flooding in the late winter of 1963 and spring of 1964 was the probable agent of reduction.

More direct effects of flooding were observed in the last three weeks of February, 1965. Rain in excess of four inches fell in five days (8-12 February). Although flooding was not so extensive as in the spring of 1964, standing water plus low temperatures that prevailed undoubtedly produced conditions that were adverse for small mammals. Only three of 51 white-footed mice marked previous to 8 February were captured after 12 February; these were obtained in a one-acre cornfield that was wet and muddy, but not under water as was the surrounding woodland. Unmarked mice first appeared in the outer traplines of the bottomland study area on 27 February 1965. Recovery of the population was slow; three unmarked individuals were captured in February, seven in March, and nine in April.

Thus, the white-footed mice either emigrated from the area or were drowned. Apparently they did not escape the flood by climbing. If the mice had emigrated, a few individuals would be expected to return after the flood waters had receded. Except for the three mice that were isolated in the cornfield, unmarked individuals subsequently became established in the area. Therefore, decimation rather than emigration was the probable fate of the population of *P. leucopus* that inhabited the wooded bottomland prior to the flood. Blair (1939) reported that flooding adversely affected

populations of white-footed mice; but, re-invasion from adjacent areas, after the recession of flood waters, was not noted.

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