Use of Woodchuck Burrows by Woodchucks and Other Mammals

L. L. Schmeltz and John O. Whitaker, Jr.
Department of Life Sciences, Indiana State University, Terre Haute, Indiana 47809

Abstract

Live traps were set in the entrances of 94 woodchuck burrows along a flood control dike in Vigo County, Indiana, in such a way as to capture large mammals inside the burrows. Besides 35 woodchucks, 20 opossums *Didelphis virginiana*, 19 cottontails *Sylvilagus floridanus*, 8 raccoons *Procyon lotor*, 1 red fox *Vulpes vulpes*, and 1 gray fox *Urocyon cinereoargenteus* were taken. Snap traps set in the same burrow entrances yielded 104 white-footed mice *Peromyscus leucopus*, 32 house mice *Mus musculus*, 10 short-tailed shrews *Blarina brevicauda*, and 2 each of the meadow jumping mouse *Zapus hudsonius*, the meadow vole *Microtus pennsylvanicus*, and the masked shrew *Sorex cinereus*.

Introduction

There is scattered information on the use of woodchuck burrows by mammals other than woodchucks. Hamilton (1934) indicated that rabbits, skunks, foxes, and weasels frequently use woodchuck burrows, and also related occasional use by chipmunks and house cats. Grizzell (1955), mentioned most of those species, and also opossums, raccoons, squirrels, ground squirrels, and some small mammals including *Mus musculus*, *Peromyscus leucopus*, *Microtus pennsylvanicus*, *M. pinetorum*, *Zapus hudsonius*, and *Blarina brevicauda*. To our knowledge, there has been no systematic effort to determine usage of woodchuck burrows by various species of mammals, and the purpose of this study was to determine such use.

Study Area

The study area was a grassy covered flood control levee along the west side of the Wabash River north of Terre Haute, Vigo County, Indiana. Major grasses present were *Bromus* sp. and fescue *Festuca* sp. Inside the levee (away from the river) the land consisted mostly of cornfields. Outside was about 50 percent cultivated land. Trees present were primarily silver maple *Acer saccharinum* and cottonwood *Populus deltoides*. The levee is about 8 km long, but the portion used for this study consisted of about 3,500 m. Levee maintenance included yearly burning, usually about 1 March.

Materials and Methods

A series of 94 woodchuck burrow openings that appeared to have been in recent use (as indicated by presence of cuttings, fresh dirt, odor, tracks) was studied along a section of dike. The dens were marked with numbered stakes. Large Tomahawk live traps baited with corn were used to sample the large mammals. A trap was placed with its door in the mouth of the burrow in such a way that it would be likely to capture an animal inside the burrow at the time the trap was set. Those traps were used at about 1–3 month intervals from October 1970 through April 1972. The mamals were toe clipped in a consecutively numbered series, sexed, weighed, and released at the point of capture. A card including the date of each capture, approximate age at first capture, weight in pounds, and the burrow number for each capture was made for each numbered animal. Later, 199 woodchucks were trapped with No. 2 steel and No. 220 conibear traps, or shot with a .22 caliber rifle, many of them beyond the limits of the trapping area.

Burrow use by small mammals was studied using 2 snapback mousetraps placed inside the entrance of each burrow during 5 different 2-day periods during the study. Unfortunately, no traps were used that would sample weasels or chipmunks.

TABLE 1.—USE OF WOODCHUCK BURROWS BY LARGE MAMMALS ON A FLOOD CONTROL LEVEE ALONG THE WABASH RIVER AT TERRE HAUTE, VIGO COUNTY, INDIANA

	Animals Taken		Captures and Recaptures	
	No.	%	No.	%
Woodchuck	35	42.1	74	57.4
Opossum	20	24.1	21	16.3
Cottontail	18	21.7	24	18.6
Raccoon	8	9.6	8	6.2
Gray Fox	1	1.2	1	0.8
Red Fox	1	1.2	1	0.8
	83	99.9	129	100.1

RESULTS AND DISCUSSION

Six species of large mammals were taken, including 129 total captures and recaptures of 83 individuals (Table 1). Mammals were caught at 62 of the 98 burrow entrances, thus 36 (36.7%) yielded no larger mammals. Thirty-five different woodchucks were taken a total of 74 times. This constituted 42.1 percent of all large mammals taken, and 57.4 percent of all captures and recaptures. Ten woodchucks were captured once and never seen again, while 6 others were taken once in the burrows and later in conibear traps in or near the study area. Those 6 were retaken 1 to 18 months after the first capture, an average of 1,456 m from the initial capture site (28 m to 3.6 km). The animal retaken after 18 months was 46 m from the original burrow. Two others were taken at sites about 2.4 km apart with short periods between recaptures, 27 and 24 days, respectively. Nineteen individuals accounted for the 39 recaptures. Six were taken twice, 9 were taken 3 times, 2 were taken 4 times, 1 was taken 5 times, and 1 was taken 6 times. Most were taken in different traps each time they were captured, except 1 was taken 3 times in the same trap, and 5 were taken twice in the same trap. One woodchuck, taken in a burrow on 16 October 1970 was retaken in a burrow 800 m away on 9 December 1970, and again in the first burrow on 29 March 1971. One individual was taken 5 times in 5 different burrows, all within a span of 18 days and 150 m. The one taken 7 times was in 5 different burrows within 185 m of one another over a 10-month period.

The latest fall date a woodchuck was taken was 9 December, although one individual appeared to be active throughout the winter of 1970–71, feeding on a patch of uncut corn near its burrow. Most dens were plugged during the winter. Early emergence was about 5 February, when 5 dens were found to have been recently reopened. By 25 February, a number of other dens had been reopened.

Eighteen cottontails, captured 24 times, comprised 21.7 percent of all mammals taken, and 18.6 percent of the total captures. Fifteen rabbits were captured once each, 1 was captured twice, 1 was taken 3 times, and 1 a total of 4 times. No rabbit was captured twice in the same burrow and only 2 burrows yielded more than 1 rabbit, 1 with 2 and 1 with 3. Cottontails used the burrows primarily during the colder months. There were 6 captures in October, 10 in November, 2 in December, and 4 in February.

Twenty opossums were taken. There was only 1 recapture seeming to indicate that the opossums did not live in the burrows, but simply visited them. Included were 7 males, all taken in fall, 6 females carrying young (May to July), and 7 other females.

Eight raccoons were taken, comprising 9.6 percent of all mammals taken. Five were females, 3 were males, and 4 were young. Raccoons used the burrows sporadically, with 1 capture each in May, July, and August, 3 in October, and 2 in November.

One red fox and 1 gray fox were taken in burrows during the study.

The most common small mammals in the general vicinity of the burrows were *Peromyscus leucopus*, *Microtus pennsylvanicus*, *Mus musculus*, and *Peromyscus maniculatus*. In the grassy areas of the burrows, *M. pennsylvanicus* was particularly abundant. However, that species seldom used the burrows (Table 2). The major user of the burrows among the small mammals was *Peromyscus leucopus*, 104 individuals being

TABLE 2.—USE OF WOODCHUCK BURROWS BY SMALL MAMMALS ON A FLOOD CONTROL LEVEE ALONG THE WABASH RIVER NEAR VIGO COUNTY, TERRE HAUTE, INDIANA. MAMMALS ARE INDICATED AS THE TOTAL NUMBER TAKEN AND THE NUMBER TAKEN PER 100 TRAPNIGHTS. THE NUMBER AND PERCENTAGE OF BURROWS IN WHICH EACH SPECIES WAS TAKEN IS ALSO GIVEN. THE NUMBER OF TRAPNIGHTS IS 4 TIMES THE NUMBER OF BURROWS TRAPPED IN EACH CASE SINCE 2 TRAPS WERE USED IN EACH BURROW FOR 2 NIGHTS

Dates and No. of Burrows Trapped		*Peromyscus leucopus*	*Peromyscus maniculatus*	*Mus musculus*	*Blarina brevicauda*	*Zapus hudsonius*	*Microtus pennsylvanicus*	*Sorex cinereus*	Totals
22–24 Nov	No. taken	47	1	17	2				67
1970	No./100 trapnights	15.1	0.3	5.4	0.6				21.5
(78)	No. burrows	32	1	8	2				40
	% of burrows	41.0	1.2	10.3	2.6				51.2
28–30 March	No. taken	1	4	3	1			2	11
1971	No./100 trapnights	0.3	1.3	1.0	0.3			0.7	3.6
(75)	No. burrows	1	3	3	1			2	8
	% of burrows	1.3	4.0	4.0	1.3			2.6	10.7
30 May–1 Jun	No. taken	1	17	3		2			23
1971	No./100 trapnights	0.3	4.5	0.8		0.5			6.1
(94)	No. burrows	1	16	3		2			20
	% of burrows	1.1	17.0	3.2		2.6			21.3
22–24 Nov	No. taken	46		8	7		1		62
1971	No./100 trapnights	15.3		2.7	2.3		0.3		20.7
(75)	No. burrows	34		6	7		1		44
	% of burrows	45.3		8.0	9.3		1.3		82.7
18–20 Apr	No. taken	9	7	1			1		18
1972	No./100 trapnights	4.7	3.6	0.5			0.5		9.4
(48)	No. burrows	9	6	1			1		15
	% of burrows	18.8	12.5	2.1			2.1		31.3
(370)	No. taken	104	29	32	10	2	2	2	181
	No./100 trapnights	7.0	2.0	2.2	0.7	0.1	0.1	0.1	12.2
	No. burrows	77	26	21	10	2	2	2	127
	% of burrows	20.8	7.0	5.6	2.7	0.5	0.5	0.5	34.3

taken in snap traps for a rate of 7.0 per 100 trapnights. *Peromyscus maniculatus* and *Mus musculus* used them less, probably because they were less closely associated with the burrows. *Peromyscus leucopus* lived in the brushy areas along the dike itself, while the other 2 species lived primarily in the cultivated fields a few feet further away.

Overall, 181 small mammals were taken in the burrows (12.2 per 100 trapnights). However, the greatest utilization was in the fall (Table 2). In November 1970, 21.5 per 100 trapnights were taken and in November 1971, 20.7 were taken. Respective values for March 1971 and April 1972 were 3.6 and 9.4.

It is clear from these data that several species of mammals other than woodchucks are opportunistic users of woodchuck burrows.

There would seem to be several uses that mammals, both large and small, might make of the burrows. First, some individuals may live there permanently or over extended periods. These would seem to include perhaps some rabbits and white-footed mice in addition to the woodchucks. Some mammals may use the burrows as

as temporary cover, including many of the larger and some of the smaller mammals taken. Some individuals, especially of the smaller species, may simply have been exploring the burrows. This would not seem likely in the case of most of the larger mammals, because the large traps were set during the day and in the burrows in such a way as to capture animals that were inside, and thus presumably had spent the night there.

Subsequent to this work a meadow jumping mouse was found in a hibernating nest in this same dike (Jones and Whitaker 1976).

LITERATURE CITED

GRIZZELL, R. A. 1955. Hibernating jumping mice in woodchuck dens. Amer. Midl. Nat. 53:257–293.

HAMILTON, W. J., JR. 1934. The life history of the rufescent woodchuck, *Marmota monax rufescens*. Ann. Carnegie Mus. 23:85–178.

JONES, G. S., AND J. O. WHITAKER, JR. 1976. The fauna of a hibernation nest of a meadow jumping mouse, *Zapus hudsonius*. Can. Field-Nat. 90:169–170.