Content and Taxonomic Comments

Currently, seven subspecies of the woodland vole (Microtus pinetorum) are recognized (Smolen 1981), six of which occur in the South: M. p. auricularis, M. p. carbonarius, M. p. nemoralis, M. p. parvulus, M. p. pinetorum, and M. p. scalopsoides. Van der Meulen (1978) and Repenning (1983) regarded M. p. nemoralis and M. p. parvulus as distinct species, although Whitaker and Hamilton (1998) suggest that all subspecies occurring in the South are referable to M. p. pinetorum. Pitymys was a recent generic synonym (Van der Meulan 1978, Zakrzewski 1985). Smolen (1981) reviewed the literature on this species. The woodland vole also is commonly referred to as the pine vole (Whitaker and Hamilton 1998).

Distinguishing Characteristics

The woodland vole is a small vole with a short tail and well developed forelimbs and claws that reflect semi-fossorial habits. The measurements are: total length 97–145 mm; tail 17–25 mm; hind foot 13–20 mm; ear 8–13 mm; weight 18–35 g. The dental formula is: I 1/1, C 0/0, P 0/0, M 3/3 = 16 (Figure 1). The pelage is smooth and silky, reddish to chestnut brown dorsally, and buffy to silvery gray ventrally. The tail is short (less than 20% body length) and slightly bicolor. The woodland vole skull is distinctive, with the third upper molar having two closed triangles, and the first lower molar three closed triangles and two anterior loops. See keys for details.

Conservation Status

Microtus pinetorum has a global rank of Secure (NatureServe 2007). It is also considered Secure in Alabama, Georgia, Kentucky, Mississippi, North Carolina, Oklahoma, Tennessee, and Virginia. Louisiana and Arkansas list it as Apparently Secure, and Texas lists it as Vulnerable. It is unranked in South Carolina and Florida.

Distribution

The woodland vole is distributed across most of eastern United States and southern Canada. It is present throughout the South (Figure 2) including all of Virginia (Handley and Patton 1947, Handley 1979, Rose et al. 1990, Handley 1992, Pagels et al. 1992), Kentucky (Barbour and Davis 1974, McPeek et al. 1983, McGehee-Marsh et al. 1992, Kiser and Meade 1993), Tennessee (Smith et al. 1974, Kennedy 1991, Linzey 1995), North Carolina (Lee et al. 1982, Clark et al. 1985), South Carolina (Golley 1966, Cothran et al. 1991), Arkansas (Sealander and Heidt 1990), and eastern Oklahoma (Caire et al. 1989, Haner et al. 1999). In Georgia, the
Woodland Vole (*Microtus pinetorum*)

species occurs statewide except for the extreme southeastern coast (Golley 1962, Laerm et al. 1982, Ford et al. 1994). Apart from the coastal regions along the Gulf of Mexico, the woodland vole also occurs throughout Alabama (Holliman 1963, Wolfe and Rogers 1969, Linzey 1970), Mississippi (Kennedy et al. 1974, Jones and Carter 1989), Louisiana (Lowery 1974, Williams et al. 1980, Mullin and Williams 1987) and eastern Texas (Davis and Schmidly 1994). In Florida, the species is restricted to the northern portions of the panhandle and north-central peninsular area as far south as the Ocala area (Neill and Boyles 1955, Arata 1965, Whitaker and Hamilton 1998).

**ABUNDANCE STATUS**

The species is common to abundant throughout the region. Density estimates vary by season and habitat, and have been reported as high as 14/ha (Fitzgerald and Madison 1983). The species undergoes cyclic population fluctuations, usually with peak numbers in spring and fall and fewer in summer, primarily due to reproductive output (Paul 1970). Typically, woodland voles are underreported in most small mammal surveys in the region, in part due to their semi-fossorial nature and difficulty of capture (Bellsows et al. 2001).

**PRIMARY HABITATS**

The woodland vole occurs in a diversity of woodland and grassland habitats throughout the South, but deciduous forest sites with mesic, well-drained soils and a dense ground cover of litter or vegetation are preferred (Smolen 1981, Miller and Getz 1969, Getz 1985, Rhoades and Richmond 1985, Linzey 1995, Haner et al. 1999). The species spends much of its time below the litter and humus layer where it burrows and nests. There are records of woodland voles at elevations >1,300 m in the Southern Appalachian Mountains. However, generally the species is found from 600 m in the mountains to near sea level on the Atlantic Coastal Plain (Linzey 1995, Ford et al. 2000, Bellsows et al. 2001). It also is commonly associated with upland grassy areas, fencerows, railroad rights-of-way, cropland, and orchards. Woodland voles frequently can cause economic damage by root-girdling fruit trees and consuming crops (Eadie 1954, Anthony and Fisher 1977, Smolen 1981, Whitaker and Hamilton 1998).

**REPRODUCTION**

Regional populations probably breed throughout the year; however, some studies suggest most activity is concentrated from March through October. Farther north, reproductive activity may decline or cease by early winter (Benton 1955). Upwards of 4 litters of 1–6 neonates are produced annually. Gestation is 20–24 days and young are weaned at 17–21 days. Individuals are sexually mature by 6–8 weeks (Horsfall 1963, Paul 1970, Valentine and Kirkpatrick 1970, Goertz 1971, Cengel et al. 1978, Schadler and Butterstein 1979).

**FOOD HABITS**

The diet of the woodland vole varies seasonally. Forb and grass roots predominate in spring and summer, whereas seeds and fruit are consumed in fall, and bark and roots are utilized in winter (Benton 1955, Cengel et al. 1978). Habitat also affects diet as woodland voles in orchards and grassland habitats feed primarily on green vegetation and those in woodlands eat greater seed amounts. *Endogone* fungus and insects also have been recorded as food items (Linzey 1995, Whitaker and Hamilton 1998).

**ASSOCIATED SPECIES**

Regionally, common faunal associates include the northern short-tailed shrew (*Blarina brevicauda*), southern short-tailed shrew (*B. carolinensis*), least shrew (*Cryptotis parva*), pygmy shrew (*Sorex hoyi*), southeastern shrew (*S. longirostris*), cotton mouse (*Peromyscus gossypinus*), white-footed mouse (*P. leucopus*), eastern harvest mouse (*Reithrodontomys humulis*), hispid cotton rat (*Sigmodon hispidus*), meadow jumping mouse (*Zapus hudsonius*), meadow vole (*M. pennsylvanicus*), and prairie vole (*M. ochrogaster*).
VULNERABILITY AND THREATS

Nowhere within its distribution does the woodland vole appear to be vulnerable or threatened. Locally, it often is regarded as a serious pest species for agriculture, horticulture, and silviculture that requires control (Eadie 1954, Anthony and Fisher 1977, Smolen 1981).

MANAGEMENT SUGGESTIONS

In areas where woodland voles are causing economic damage, population control or cultural management may be necessary. Grass and weed control around young fruit trees can prevent damage by woodland voles during the growing season. Additionally, stem exclosures constructed of hardware cloth extending below the ground line can protect young trees during the winter months. Toxic baits have been used in areas where high vole populations are causing extensive damage (Fisher and Hygnstrom 2003).

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Woodland Vole (*Microtus pinetorum*)


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