

White-footed vole, *Arborimus albipes*

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Description: A small (149-182 mm, TL) *Microtus*-like rodent with a blunt face and short (12-16 mm) concealed ears; long, soft pelage; dorsum brown; ventrum gray washed with light brown; fore and hind feet (18-21 mm) with white dorsal surfaces and straight claws; small eyes; and a long (57-75 mm), sharply, bicolored (white below and blackish above), scantily-haired tail (Merriam 1901, Maser and Johnson 1967, Maser et al. 1981). Weight is from 17 to 28 g (Maser and Johnson 1967). They are distinguished from the closely related red tree vole (*Arborimus longicaudus*) by their slightly smaller size, white instead of dark brown-colored feet with straight claws, brown rather than orangish-red dorsal coloration, sparsely-haired and sharply-bicolored tail, and long, narrow, rounded skull (Merriam 1901, Howell 1926, Bailey 1936).

Taxonomic Remarks: The white-footed vole is one of three species in the genus *Arborimus*, a genus considered to be among the most primitive members of the vole family. Merriam (1901) first described the white-footed vole as *Phenacomys albipes*. Taylor (1915) later assigned it to the genus *Arborimus*, subgenus *Phenacomys*. Since then, the species has had a confusing taxonomic history (see Howell 1926, Hall and Cochrum 1953, Hall and Kelson 1959, Hall 1981, Repenning and Grady 1988). Johnson (1973) and Johnson and Maser (1982) elevated *Arborimus* to generic rank, recognized by Wilson and Reeder (1993). Pending additional molecular and morphological data, the name *Arborimus albipes* is recognized here.

Distribution: White-footed voles are confined to western Oregon and extreme northwestern California (Hall 1981). They inhabit humid forested areas along the coast from the Columbia River, Oregon, southward to Humboldt County in northwestern California (Maser and Johnson 1967). In California, *A. albipes* is known from six disjunct localities in Humboldt and Del Norte counties. The altitudinal range of this taxon is from near sea level to ca 3,500 ft (Maser and Johnson 1967). Most California localities are from low-lying areas (Williams 1986).

Life History: Little is known about the biology of this apparently rare vole (Maser et al. 1981). The species is secretive, probably active year-round, and generally nocturnal with some diurnal activity (Zeiner et al. 1990). White-footed voles may breed throughout the year (Maser 1966). However, pregnant individuals have been captured only from mid-April to late July (Johnson and Maser 1982), suggesting an extended spring-summer breeding season. White-footed voles probably produce a single litter annually of one to four (usually two or three) young per litter (Maser et al. 1981, Johnson and Maser 1982). Like the red tree vole (Carey 1991), aspects of the reproductive biology of white-footed voles, such as long reproductive period, small litter size, and possible slow development and extended nursing of young (Maser et al. 1981), have been linked to difficulties associated with metabolizing vascular plant leaves. Nest site requirements of this taxon are unknown; however, like other voles, it probably constructs nests of dried vegetation under stumps, logs, or rocks (Zeiner et al. 1990). There is no information on longevity, population structure, population density, movement, home range size, or social behavior of white-footed voles.

The diet consists entirely of leaves from trees, shrubs and herbs, with no evidence found for the use of seeds, fruits, fungi, or animal matter (Voth et al. 1983). Leaves from hardwood trees accounted for 57% of the diet of white-footed voles, followed by forbs (23%), and shrubs (15%) (Voth et al. 1983). Howell (1928) reported finding only finely triturated roots of herbaceous plants in the stomachs of three white-footed voles collected in California. Structural features, such as a longer tail and long nails, suggest that white-footed voles are probably more scansorial than most other species of voles (Johnson and Maser 1982). Its arboreal habits are substantiated by its dependence on alder

and willow leaves. Its terrestrial habits are confirmed by its capture in ground-based traps and the presence of low forbs and grasses in its diet (Voth et al. 1983). Thus based on food habit and trapping data, the spatial niche of the white-footed vole extends from ground level into tree and shrub canopies (Voth et al. 1983). Water is probably obtained from nearby streams and by licking condensation or rain from leaves.

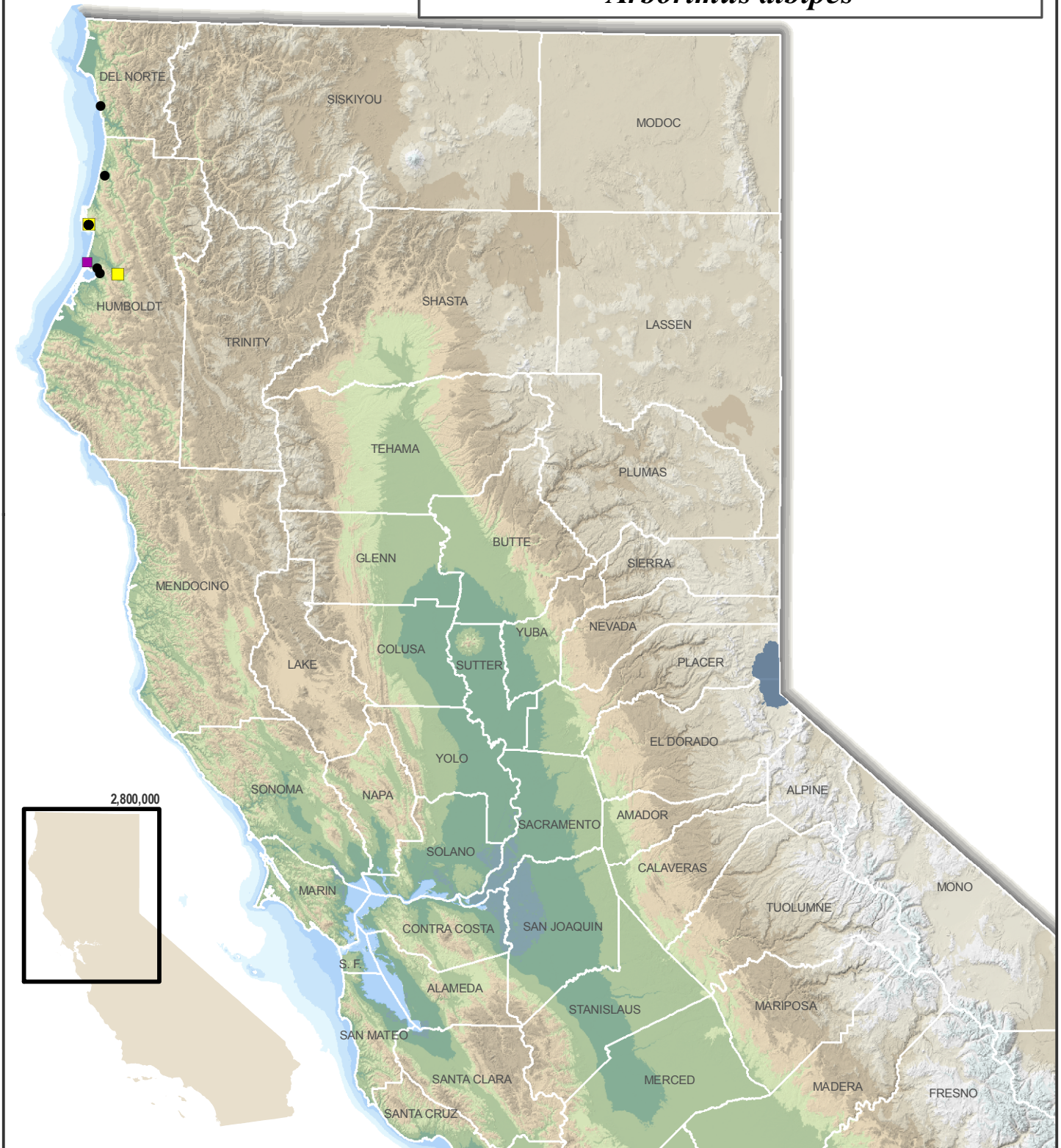
Habitat: Early mammalogists reported the species only along small streams in humid coastal forested areas (Howell 1926, Grinnell 1933, Bailey 1936). Maser and Johnson (1967) concluded that it prefers areas of herbaceous growth found in riparian communities along small streams, or in small clearings created by fallen timber in redwood or Douglas-fir forests. Alder thickets and other riparian communities along small streams may constitute essential habitat for this taxon (Maser et al. 1981). In Oregon, the primary habitat for this taxon is riparian-alder thickets found along smaller streams (Voth et al. 1983). In California, this species has been captured in a variety of situations, but generally appeared to be associated with small clear streams flowing through humid coniferous forests (Maser and Johnson 1967). Of the eleven specimens captured in California, nine were found in close proximity to alder, bay or maple thickets along small clear streams flowing through redwood forests (Maser 1966). There are a few records of white-footed voles having been captured several hundred meters from streamside habitat on recently logged (two years after logging), or burned land (Maser and Johnson 1967, Maser and Hooven 1969).

Status: Class II. The principal reasons for concern are its restricted range in California, narrow habitat preferences, scarcity of numbers, and threat of continued degradation and destruction of its preferred riparian-redwood forest habitat from timber harvest. The white-footed vole is probably one of the rarest voles in North America (Maser et al. 1981). The only recent record of this species for California is a specimen (HSU 1509) captured in 1972 south of Patrick's Point State Park, Humboldt County. Based on the limited specimen records (11 specimens from 6 localities in California), this species should be considered rare and locally restricted in California. The species is associated with riparian habitats in old-growth redwood forests, and is probably adversely affected by clearcut logging, fires, windstorms and other alterations that destroy or alter the composition of riparian and understory habitats. Loss and fragmentation of undisturbed coast redwood forest habitat throughout the California range of this species has been extensive. Fox (1988) estimated that only about 12% of coastal old-growth redwood forests remain in California, with almost half of this on private or unreserved lands which are susceptible to continuing timber harvests.

Management Recommendations: The first priority is to obtain reliable data on its distribution and abundance, habitat needs, and extent of remaining suitable habitat. Improved inventory methods for this secretive vole are needed. Based on the distribution of white-footed voles in Oregon (Maser and Johnson 1967), the species may be found on forest lands situated farther inland and at higher elevations in Del Norte and Humboldt counties. State agencies, the National Park Service, and the U. S. Forest Service should undertake detailed surveys to determine the distribution, population status, and habitat needs of white-footed voles on lands administered by them within these two counties. Logging activities or any type of construction that alter the overstory canopy or understory habitat of riparian communities along small streams in coast redwood forests should be minimized or prohibited in the vicinity of sites found to support extant populations.

WHITE-FOOTED VOLE

Arborimus albipes



- Locations verified by authors
(captures, observations, museum records)

- CNDDDB 1979 - 1998
- CNDDDB 1978 and before