

Western Red Bat

(Lasiurus blossevillii)

Legal Status

Federal: USFS Sensitive

State: CDFG Species of Special Concern (2007)



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CNDDDB Rank: G5SNR; Global Rank, G5 = Secure: Common; widespread and abundant. State rank, SNR = Unranked: state conservation status not yet assessed.

Western Bat Working Group: High Priority

IUCN: Red list category: LR: lc (Lower risk: least concern)

Recovery Plan: None

Species Description and Life History

The western red bat (*Lasiurus blossevillii*) is a member of the taxonomic Order Chiroptera and Family Vespertilionidae. The generic name *Lasiurus* may be translated as “hairy-tailed”. Until 1988 the western red bat was considered a subspecies of *Lasiurus borealis* and was known as *L. b. teliotis* (Shump and Shump 1982). Current taxonomy recognizes the eastern red bat (*L. borealis*) and the western red bat (*L. blossevillii*; Baker *et al.* 1988).

This species is a medium-sized bat (6-13 g) with short, broad, and rounded ears that do not extend much above the dorsal fur, and the nose is plain and short. The western red bat is not likely to be confused with other species due to its distinctive reddish coloration. Its congener, the hoary bat (*L. cinereus*), occurs in Yolo County but it is a larger bat with dark gray, frosted-looking fur, yellow fur around the face, and black rimmed ears. Barbour and Davis (1969) state that the western red bats’ tail is long and extends straight out behind in flight, which gives it a distinctive silhouette against the sky as compared to other species with shorter tails.

Potential predators include jays (Allan 1947, Constantine 1959, Elwell 1962, Hoffmeister and Downes 1964), crows, kestrels, hawks, owls, snakes (Allen 1939), opossums (Sperry 1933), skunks, weasels, rats, and cats. Constantine (1959) observed a jay attacking a western red bat alongside a country road near Davis. Terrestrial predators may capture bats roosting in low-growing branches. The only longevity record known for this species is 3 years in captivity however it does not adapt well to captivity (M. Pearson pers. comm.).

Western red bats are usually solitary, except when adult females are with their young. Pups are born from late spring to early summer. Three pups are usual in a litter and there may be as many as five (Allen 1939). It is thought that red bats have more young than other bat species because their roosting habits in foliage expose them to greater predation. The literature contains numerous accounts of birds attacking red bats and their young (Allan 1947, Constantine 1959, Elwell 1962, Hoffmeister and Downes 1964). Multiple pups seem especially burdensome to females because grounded mothers have often been found unable to fly due to the weight of clinging pups (Allan 1947, M. Pearson pers. comm., Stains 1965). Western red bat pups are weaned between 6 to 8 weeks of age when they have grown to adult size and are thus able to fly. The only state with multiple breeding records for the western red bat is California and the Central Valley is of primary importance to breeding populations (Pierson *et al.* 2004).

Habitat Requirements and Ecology

Roosting Ecology

This species roosts in the foliage of large shrubs and trees, usually sheltering on the underside of overhanging leaves. It often hangs from one foot on the leaf petiole but may occasionally hang from a twig or branch (Barbour and Davis 1969) and may resemble a fruit or dead leaf. Rarely, western red bats have been observed roosting in mines. Roosting habitat is found in woodland borders, rivers, agricultural areas, and urban areas with mature trees (Harvey *et al.* 1999). Roost sites have been found in edge habitats adjacent to riparian habitat or open fields, and in orchards (WBWG 1998). Roost trees are typically large cottonwoods, sycamores, walnuts, and willows associated with riparian habitats (Adams 2003). Pierson *et al.* (2004) describe roosting habitat as large diameter riparian cottonwoods and sycamores, and older orchard trees (particularly walnuts).

Foraging Ecology

Foraging occurs in and amongst vegetation and this species forages regularly over the same territory (Allen 1939). Foraging has been noted in habitats such as mature orchards, oak woodland, low elevation conifer forest, along riparian corridors, among non-native trees in urban and rural residential areas, and also near strong lights that attract flying insects. In addition, this species may forage in habitats and agricultural areas adjacent to streams and rivers that do not provide roosting habitat. No dietary information is available for western red bats in California however eastern red bats prey on moths, flies, beetles, and tiny wasps (WBWG 1998). This species may forage all night or often there is an initial foraging period after sunset and a minor secondary activity period before sunrise that corresponds to insect activity (WBWG 1998).

Habitat requirements in Yolo County may include open, free water for drinking and foraging, undisturbed foliage roost sites that provide protection from predators, and structurally diverse vegetation that support a diversity of insect prey for foraging habitat.

Water features are a vital habitat component because bats often drink immediately after emergence and water is an important source and concentration site for insects. Studies by Pierson *et al.* (1999) comparing mature riparian habitat extending >50 m back from the Sacramento River to areas with less extensive or degraded habitat suggest that this species prefers the mature, extensive riparian habitat. Mature orchards with dense canopies provide alternate roosting and possibly foraging habitat (Pierson *et al.* 2004).

Species Distribution and Population Trends

The western red bat occurs throughout the Central Valley in broadleaf tree communities and is less abundant above low and middle elevations in mixed conifer forests (Pierson *et al.* 1999). This species has been captured in blue oak woodland in the Sutter Buttes, Sutter County (Johnson 2000) and one western red bat was found in downtown Sacramento in an area with large diameter, mature sycamore trees (H. Johnson, pers. obs.). Pioneering research on the roosting habits of this species was conducted in Yolo County near Esparto, Capay, and Rumsey where roost sites were found in fig, apricot, and orange orchards (Constantine 1959).

Pierson *et al.* (2004) conducted surveys for the western red bat as part of a statewide species status and distribution report to the CDFG. The CNDDDB (2007) contained one record from Knight's Landing from this study. Additional records were obtained from western red bat specimens submitted to the Yolo County Health Department (D. Constantine unpubl. data). Pre-1980 specimen localities (roughly 39 bats) included 1/6 mile east of Esparto, Capay, 1 mile south of Rumsey, 1 mile south and 2 miles west of Esparto, 1 mile south and 4 miles west of Esparto, U.C. Davis, and Davis. Post-1980 localities (18 specimens) included Davis, Dixon, Woodland, Zamora, Knight's Landing, and Dunnigan. It is also was recently reported at two locations on Cache Creek, and one on Putah Creek (D. Johnston, pers. comm.).

Several aspects of this species' life history are uncommon among bats in northern California, namely its roosting habits, social habits, reproduction, and migratory habits. This species makes north-south migrations in spring and fall that may be hundreds of miles. Cryan (2003) studied seasonal dispersal of the western red bat on a continental scale and stated that seasonal dispersal from California is apparently limited, and it is unclear if California populations mix with others to the south and east. During migration, western red bats may form small groups (Constantine 1959) and males and females may travel separately. Western red bats may be year-round residents in the Bay Area (Orr 1950). During winter cold snaps the eastern red bat hibernates, and the western species may do so as well. David Feliz (pers. comm.) found a western red bat hibernating inside a pile of dried leaves in February near the town of Stockton.

Population Trends

Current population trends are unknown. Bat biologists from the California Bat Working Group conducted a bat species status assessment workshop in Davis in 2007 as part of

ongoing efforts to produce a California Bat Conservation Plan. The western red bat was ranked in the top five species of conservation concern.

O'Shea *et al.* (2003) states that current estimates of the relative abundance of these low-density, foliage-roosting species come primarily from capture and acoustic monitoring index measures. An example of an acoustic index measure is the number of minutes per hour this species is recorded. Acoustic monitoring of foraging activity may be the primary means of monitoring this species and assessing habitat condition. The United States Geological Survey has a report in press that may have suggestions for improving methods of estimating numbers of bats with this type of life history (O'Shea and Bogan, editors 2003). Pierson and Rainey (Stillwater Sciences *et al.* 2003) were able to infer western red bat roost locations and migratory and foraging activity by observing riparian woodland at the time of sunset and visually and acoustically monitoring bats as they emerged.

Anecdotal observations support the contention that historical abundance of eastern and western red bats was likely much greater than at present (O'Shea *et al.* 2003). Carter *et al.* (2003) concluded that quantitative information concerning long-term population trends of solitary foliage roosting bats cannot be drawn from existing data because of the lack of standardized reporting and the inability to determine the proportion of total populations sampled. Carter *et al.* (2003) noted that indices of abundance such as submissions to health agencies for rabies testing and trends in habitat are the only present means to indirectly assess species status.

Threats to the Species and Other Conservation Issues

The primary threats to the western red bat are habitat loss and wind farm mortality. The Central Valley is this species' primary breeding region based on museum and capture records (Pierson *et al.* 2004); it is estimated that less than 6% of relatively intact old growth, riparian forest remains (Katibah, 1984). Roosting habitat in cottonwood and sycamore stands may be lost due to a lack of regeneration from hydrological alteration of watersheds. This species is especially susceptible to impacts from wind farms based on evidence from mortalities reported for eastern red bats (Johnson *et al.* 2003) and from a wind farm in Solano County (B. Hogan pers. comm.).

Pesticides and herbicides used in orchards likely directly impact roosting bats, as well as potentially reducing prey resources. The extent of western red bats over-wintering in leaf piles is unknown, but the burning and management of leaf piles could potentially impact this species. Although western red bats occur in urban and agricultural habitats, they may suffer higher levels of predation from the unnaturally high numbers of jays, crows, opossums, and domestic cats supported by and concentrated in these habitats (Pierson *et al.* 2002).

Data gaps include knowledge of the effects of pesticides and herbicides on roosting bats, the availability and use of mature orchard habitats, and the impacts of wind farm mortalities on western red bat populations, especially given the importance of California

to breeding. Conservation of this species would benefit greatly from riparian restoration, particularly recruitment of cottonwood/sycamore and reinstatement of natural flood regimes (Pierson *et al.* 2004). Conservation efforts, and specifically the restoration of large areas of Cache Creek, will greatly improve potential habitat for the western red bat.

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