# California Department of Fish and Game California Interagency Wildlife Task Group

WILLOW FLYCATCHER Empidonax traillii

Family: TYRANNIDAE Order: PASSERIFORMES Class: AVES

B315

Written by: D. Gaines Reviewed by: L. Mewaldt Edited by: R. Duke, S. Granholm

Updated by: CWHR Program Staff, July 2005

#### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A rare to locally uncommon, summer resident in wet meadow and montane riparian habitats at 600-2500 m (2000-8000 ft) in the Sierra Nevada and Cascade Range. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows (Serena 1982). Has been observed breeding along the Santa Ynez river in Santa Barbara Co., and along the Santa Clara river in Ventura Co. (J. Greaves pers. comm). May still nest elsewhere in lowland California, as in San Diego Co., but definite records are lacking. Common spring (mid-May to early June) and fall (mid-August to early September) migrant at lower elevations, primarily in riparian habitats throughout the state exclusive of the North Coast (Grinnell and Miller 1944, Gaines 1977a, 1977b, Remsen 1978, McCaskie et al. 1979, Garrett and Dunn 1981).

#### SPECIFIC HABITAT REQUIREMENTS

Feeding: Makes short sallies for flying insects from exposed perches in willow thickets or from low perches in adjacent meadows. Occasionally eats berries and seeds (Bent 1942).

Cover: Dense willow thickets are required for nesting and roosting. Low, exposed branches are used for singing posts and hunting perches. In the Sierra Nevada, consistently absent from otherwise apparently suitable areas where the lower branches of willows had been browsed heavily by livestock (Serena 1982).

Reproduction: Open, cup nest is placed in an upright fork of willow or other shrub, or occasionally on a horizontal limb, at height of 0.5 to 3.0 m (1.5 to 10 ft) (Stein 1963).

Water: No specific information found, but nesting site usually near languid stream, standing water, or seep.

Pattern: Most numerous where extensive thickets of low, dense willows edge on wet meadows, ponds, or backwaters.

### SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Arrives from Central and South American wintering grounds in May and June. Departs in August; transients noted through mid-September.

Home Range: In breeding season, probably equal to territory. Density estimates range from 9.2 pairs per 40 ha (100 ac) in eastern Washington scrub habitat (King 1955), to 60.7 individuals per 40 ha (100 ac) in Michigan scrub habitat (Berger 1957).

# California Department of Fish and Game California Interagency Wildlife Task Group

YELLOW WARBLER Dendroica petechia

Family: PARULIDAE Order: PASSERIFORMES Class: AVES

B430

Written by: M. Green

Reviewed by: L. Mewaldt, D. Airola Edited by: R. Duke, D. Winkler

Updated by: CWHR Program Staff, August 2005

#### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Breeding distribution includes from the coast range in Del Norte county, east to Modoc plateau, south along coast range to Santa Barbara and Ventura counties and along western slope of Sierra Nevada south to Kern county. Also breeds along eastern side of California from the Lake Tahoe area south through Inyo co. Also breeds in several southern California mountain ranges and throughout most of San Diego county. Winters in Imperial and Colorado river valleys. Breeds in riparian woodlands from coastal and desert lowlands up to 2500 m (8000 ft) in Sierra Nevada. Also breeds in montane chaparral, and in open ponderosa pine and mixed conifer habitats with substantial amounts of brush. Numbers of breeding pairs have declined dramatically in recent decades in many lowland areas (southern coast, Colorado River, San Joaquin and Sacramento valleys). Now rare to uncommon in many lowland areas where formerly common (McCaskie et al. 1979, Garrett and Dunn 1981). A common migrant on Channel and Farallon Islands in spring and fall (DeSante and Ainley 1980, Garrett and Dunn 1981).

### SPECIFIC HABITAT REQUIREMENTS

Feeding: Mostly eats insects and spiders. Gleans and hovers in upper canopy of deciduous trees and shrubs. Occasionally hawks insects from air, or eats berries (Bent 1953, Ehrlich et al. 1988).

Cover: Usually found in riparian deciduous habitats in summer: cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland. Also breeds in montane shrubbery in open conifer forests; perhaps a recent phenomenon (Gaines 1977b). In migration, visits woodland, forest, and shrub habitats.

Reproduction: Nest is an open cup placed 0.6 to 5 m (2-16 ft) above ground in a deciduous sapling or shrub. Territory often includes tall trees for singing and foraging and a heavy brush understory for nesting (Ficken and Ficken 1966).

Water: Recorded drinking regularly at a desert waterhole (Smyth and Coulombe 1971).

Pattern: Frequents open to medium-density woodlands and forests with a heavy brush understory in breeding season. In migration, found in a variety of sparse to dense woodland and forest habitats.

### SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Nocturnal migrant.

Seasonal Movements/Migration: Usually arrives in California in April, and mostly gone by

October. Apparently there is a postbreeding, upslope movement mostly to middle elevations (Beedy 1975); scarce at elevations above 2500 m (8000 ft) (Gaines 1977b). Small numbers regularly overwinter in southern California lowlands (Garrett and Dunn 1981).

Home Range: Home range recorded as less than 0.2 ha (0.5 ac) in New York (Ficken and Ficken 1966), and 0.16 ha (0.4 ac) in lowa (Kendeigh 1941a). Kendeigh observed individuals regularly moving up to 488 m (1600 ft) to a willow-marsh edge to feed.

Territory: Territory varied from 0.03 ha (0.08 ac) on small islands in Minnesota (Beer et al. 1956), to 0.36 ha (0.9 ac) in a swamp thicket in Illinois.

Reproduction: Breeds from mid-April into early August with peak activity in June. Pair breeds solitarily. Lays 3-6 eggs (usually 4 or 5); incubated by female for 11 days. Altricial young tended by both parents until fledging at 9-12 days (Harrison 1978). Young breed the following year.

Niche: Subject to predation by small mammals, accipiters, corvids, and snakes. Brood parasitism by brown-headed cowbirds is heavy and apparently has been a major cause of the drastic decline in numbers in lowland localities in recent decades (Bent 1953, Garrett and Dunn 1981, Remsen 1978). Parasitism occurred in 9 of 25 nests or family groups in the Sierra Nevada where cowbirds were common (Rothstein et al. 1980, Verner and Ritter 1983, Airola 1986).

#### REFERENCES

- Airola, D. A. 1986. Brown-headed cowbird parasitism and habitat disturbance in the Sierra Nevada. J. Wildl. Manag. 50:571-575.
- Beedy, E. C. 1975. Avifaunal complexity and forest structure in the Sierra Nevada of California. M.S. Thesis, Univ. California, Davis. 100pp.
- Beer, J. R., L. D. Frenzel, and N Hansen. 1956. Minimum space requirements of some nesting passerine birds. Wilson Bull. 68:200-209.
- Bent, A. C. 1953. Life histories of North American Wood warblers. U.S. Natl. Mus. Bull. 203. 734pp.
- Desante, D. F., and D. G. Ainley. 1980. The avifauna of the South Farallon Islands, California. Studies in Avian Biol. No. 4. Cooper Ornithol. Soc., Lawrence, KA. 104pp.
- Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook. Simon and Schuster, New York. 785pp.
- Ficken, M. S., and R. W. Ficken. 1966. Notes on mate and habitat selection in the yellow warbler. Wilson Bull. 78:232-233.
- Gaines, D. 1977b. Birds of the Yosemite Sierra. California Syllabus, Oakland. 153pp.
- Garrett, K., and J. Dunn. 1981. Birds of southern California. Los Angeles Audubon Soc. 408pp.
- Harrison, C. 1978. A Field guide to the nests, eggs and nestlings of North American birds. W. Collins Sons and Co., Cleveland, OH. 416pp.
- Kendeigh, S. C. 1941a. Birds of a prairie community. Condor 43:165-174.
- McCaskie, G., P. De Benedictis, R. Erickson, and J. Morlan. 1979. Birds of northern California, an annotated field list. 2nd ed. Golden Gate Audubon Soc., Berkeley. 84pp.
- Remsen, J. V., Jr. 1978. Bird species of special concern in California. Calif. Dept. of Fish and Game, Sacramento. Wildl. Manage. Admin. Rep. No. 78-1. 54pp.
- Rothstein, S. I., J. Verner, and E. Stevens. 1980. Range expansion and diurnal changes in dispersion of the brown-headed cowbird in the Sierra Nevada. Auk 97:253-267.
- Smyth, M., and H. M. Coulombe. 1971. Notes on the use of desert springs by birds in California. Condor 73:240-243.
- Verner J., and L. V. Ritter. 1983. Current status of the brown-headed cowbird in the Sierra National Forest. Auk 100:355-368.

Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Updates are noted in accounts that have been added or edited since original publication.

# California Department of Fish and Game California Interagency Wildlife Task Group

NORTHERN GOSHAWK Accipiter gentilis

Family: ACCIPITRIDAE Order: FALCONIFORMES Class: AVES

B117

Written by: C. Polite, J. Pratt Reviewed by: S. Bailey Edited by: S. Bailey, P. Bloom

Updated by: CWHR Staff, August 2005

#### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Breeds in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mts., in Mt. Pinos and San Jacinto, San Bernardino, and White Mts. Remains yearlong in breeding areas as an uncommon resident. Prefers middle and higher elevations, and mature, dense conifer forests. Casual in winter along north coast, throughout foothills, and in northern deserts, where it may be found in pinyon-juniper and low-elevation riparian habitats.

### SPECIFIC HABITAT REQUIREMENTS

Feeding: Hunts in wooded areas. Uses snags and dead-topped trees for observation and prey-plucking perches. Feeds mostly on birds, from robin to grouse in size. Small mammals, of squirrel and rabbit size, often taken. Rarely eats carrion and insects. Prey caught in air, on ground, or in vegetation, using fast, searching flight, or rapid dash from a perch.

Cover: Uses mature and old-growth stands of conifer and deciduous habitats.

Reproduction: Usually nests on north slopes, near water, in densest parts of stands, but close to openings (Jackman and Scott 1975). In eastern Oregon, nest usually was located in fork of large, horizontal limb close to trunk, at bottom of live canopy 6-24 m (19-82 ft) above ground. Used large, live trees with mean dbh of 27.4 cm (11 in) (Reynolds et al. 1982). Uses old nests, and maintains alternate sites.

Water: Usually is a water source within territory. Young have been reported bathing (Bond 1942, Brown and Amadon 1968).

Pattern: Dense, mature conifer and deciduous forest, interspersed with meadows, other openings, and riparian areas required. Nesting habitat includes north-facing slopes near water.

#### SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Some movement downslope after breeding season, as far as valley foothill hardwood habitat in Sierra Nevada. Migration into lowlands occurs irregularly; probably related to availability of food rather than weather (Mallette and Gould 1978).

Home Range: Home range appears to be same as territory.

Territory: Extremely defensive of nest area. Vociferous; will strike intruders, including humans. Territory estimated to be 1.6 to 39 km (0.6 to 15 mi) (Brown and Amadon 1968). Averaged 2.1 km (0.8 mi) in Wyoming (Craighead and Craighead 1956). Distances of 2.9 to 5.6 km (1.8 to 3.5 mi) have been reported between nesting pairs.

Reproduction: Begins breeding in April in southern California, and by mid-June in the north. Female lays eggs in 3-day intervals for average clutch of 3 (range 1-5). Female incubates 36-41 days while male provides food. After hatching, female feeds brood 8-10 days, then male helps feed them. Young may leave nest to perch at about 40 days; usually fledge by 45 days. Young begin to hunt by 50 days, and often independent by 70 days.

Niche: Great horned owls, ravens, and crows may prey on young goshawks. May be limited competition for food with other accipiters.

#### REFERENCES

- Bent, A. C. 1937. Life histories of North American birds of prey. Part 1. U.S. Natl. Mus. Bull. 167. 409pp.
- Bertrand, G. A., and J. M. Scott. 1979. Checklist of the birds of Oregon. Audubon Soc. of Corvallis. Corvallis, OR. 17pp.
- Bond, R. M. 1942. Development of young goshawks. Wilson Bull. 54:81-88.
- Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. 2 Vols. Country Life Books, London. 945pp.
- Craighead, J. J., and F. C. Craighead, Jr. 1956. Hawks, owls and wildlife. Stackpole Books, Harrisburg, PA. 443pp.
- Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna No. 27. 608pp.
- Harrison, C. 1978. A field guide to the nests, eggs and nestlings of north American birds. W. Collins Sons and Co., Cleveland, OH. 416pp.
- Harrison, C. J. O., ed. 1978. Bird families of the world. Harry N. Abrams, Inc., New York. 264pp.
- Jackman, S. M., and J. M. Scott. 1975. Literature review of twenty three selected forest birds of the Pacific Northwest. U.S. Dep. Agric., For. Serv., Reg. 6, Portland OR. 382pp.
- Jones, S. 1979. The accipiters goshawk, Cooper's hawk, sharp-shinned hawk. U.S. Dept. Inter., Bur. Land Manage., Washington DC. Tech. Note TN-335. 51pp.
- Mallette, R. D., and G. I Gould, Jr. 1978. Raptors of California. Calif. Dep. Fish and Game, Sacramento. 58pp.
- Remsen, J. V., Jr. 1978. Bird species of special concern in California. Calif. Dep. Fish and Game, Sacramento. Wildl. Manage. Admin. Rep. No. 78-1. 54pp.
- Reynolds, R. T. 1975. Distribution, density, and productivity of three species of Accipiter hawks in Oregon. M.S. Thesis, Oregon State Univ., Corvallis. 39pp.
- Reynolds, R. T. 1979. Food and habitat partitioning in two groups of coexisting Accipiter. Ph.D. Diss., Oregon State Univ., Corvallis. 116pp.
- Reynolds, R. T., E. C. Meslow, and H. M. Wight. 1982. Nesting habitat of coexisting Accipiter in Oregon. J. Wildl. Manage. 46:124-138.
- Schnell, J. H. 1958. Nesting behavior and food habits of goshawks in the Sierra Nevada of California. Condor 60:377-403.
- Shuster, W. C. 1980. Northern goshawk nest site requirements in the Colorado Rockies. West. Birds 11:89-96.
- Udvardy, M. D. F. 1977. The Audubon Society field guide to North American birds: western region. A. Knopf, New York. 855pp.

B117

Life history accounts for species in the California Wildlife Habitat Relationships (CWHR) System were originally published in: Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Updates are noted in accounts that have been added or edited since original publication.

Territory: In Michigan, Walkinshaw (1966) found average territory of 0.7 ha (1.7 ac), range 0.3 to 1.2 ha (0.8 to 2.9 ac).

Reproduction: Monogamous; peak egg laying in June. Incubation 12-13 days. Clutch averages 3-4 eggs; probably single-brooded. Both sexes care for altricial young. Fledging age 13-14 days (Stein 1963).

Niche: Frequently parasitized by brown-headed cowbird. Formerly bred commonly in willow thickets throughout most of lowland and montane California (Grinnell and Miller 1944), but numbers have declined drastically in recent decades because of cowbird parasitism and habitat destruction (Gaines 1977a, Remsen 1978, Serena 1982). Heavy grazing of willows by livestock apparently reduces numbers (Ehrlich et al. 1988).

Comments: Formerly known as Traill's flycatcher (Grinnell and Miller 1944). Empidonax flycatchers are very difficult to identify in the field.

### REFERENCES

- Aldrich, J. W. 1953. Habits and habitat differences in two races of Traill's flycatcher. Wilson Bull. 65:8-11.
- Bent, A. C. 1942. Life histories of North American flycatchers, larks, swallows, and their allies. U.S. Natl. Mus. Bull. 179. 555pp.
- Berger, A. J. 1957. Population density of alder flycatchers and common goldfinches in Crateagus habitats of southeastern Michigan. Wilson Bull. 69:317-322.
- Berger, A. J., and D. F. Parmelee. 1952. The alder flyctcher in Washtenaw County, Michigan: breeding distribution and cowbird parasitism. Wilson bull. 64:33-38.
- Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook. Simon and Schuster, New York. 785pp.
- Gaines, D. 1977a. Current status and habitat requirements of the yellow-billed cuckoo in California. Calif. Dep. Fish and Game, Sacramento. 94pp.
- Gaines, D. 1977b. Birds of the Yosemite Sierra. California Syllabus, Oakland. 153pp.
- Garrett, K., and J. Dunn. 1981. Birds of southern California. Los Angeles Audubon Soc. 408pp.
- Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna No. 27. 608pp.
- Holcomb, L. C. 1972. Nest success and age-specific mortality in Traill's flycatchers. Auk 89:837-841.
- King, J. R. 1955. Notes on the life history of Traill's flycatcher (Empidonax traillii) in southeastern Washington. Auk 72:148-173.
- McCaskie, G., P. De Benedictis, R. Erickson, and J. Morlan. 1979. Birds of northern California, an annotated field list. 2nd ed. Golden Gate Audubon Soc., Berkeley. 84pp.
- Remsen, J. V., Jr. 1978. Bird species of special concern in California. Calif. Dep. Fish and Game, Sacramento. Wildl. Manage. Admin. Rep. No. 78-1. 54pp.
- Serena, M. 1982. The status and distribution of the willow flycatcher (Empidomax traillii) in selected portions of the Sierra Nevada, 1982. Calif. Dep. Fish and Game, Sacramento. Wildl. Manage. Branch Adm. Rep. No. 82-5. 29pp.
- Stein, R. C. 1963. Isolating mechanisms between populations of Traill's flycatchers. Proc. Amer. Philos. Soc. 107:21-50.
- Walkinshaw, L. H. 1966. Summer biology of th Traill's flycatcher. Wilson Bull. 78:31-46.

B315

# California Department of Fish and Game California Interagency Wildlife Task Group

LONG-LEGGED MYOTIS Myotis volans

Family: VESPERTILIONIDAE Order: CHIROPTERA Class: MAMMALIA

M027

Written by: J. Harris Reviewed by: P. Brown Edited by: D. Alley, R. Duke

### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The long-legged myotis is common in California, occurring in the coastal ranges from Oregon to Mexico, the Cascade/Sierra Nevada ranges to southern California, most of the Great Basin region, and in several Mojave Desert mountain ranges. It is absent only from the Central Valley, the Colorado and Mojave deserts (except in mountain ranges), and from eastern Lassen and Modoc cos. This species is most common in woodland and forest habitats above 1200 m (4000 ft). Also forages in chaparral, coastal scrub, Great Basin shrub habitats, and in early successional stages of woodlands and forests. Uncommon in desert and arid grassland habitats. Records range from sea level to 3600 m (11,400 ft); the latter record is from New Mexico (Findley et al. 1975).

### SPECIFIC HABITAT REQUIREMENTS

Feeding: The long-legged myotis feeds on flying insects, primarily moths (Black 1974, Whitaker et al. 1977, 1981). Flight of this species is strong and direct. It feeds at fairly low heights 3-5 m (10-15 ft) over water, close to trees and cliffs, and in openings in woodlands and forests. This species is not particularly maneuverable, and generally it makes a single attempt at capture during a feeding pass. Associated with these flight and feeding patterns is the ability to detect prey at a long distance (10 m) (Fenton and Bell 1979). The long-legged myotis responds to short-lived patches of high insect density, often congregating with other bat species (Bell 1980).

Cover: The long-legged myotis roosts in rock crevices, buildings, under tree bark, in snags, mines, and caves. Separate day and night roosts may be used. Trees probably are the most important day roosts. Caves and mines are used only as night roosts. There are a few records of hibernation in caves.

Reproduction: This species forms nursery colonies numbering hundreds of individuals, usually under bark or in hollow trees, but occasionally in crevices or buildings.

Water: This species drinks regularly, and has poor urine-concentrating ability.

Pattern: Feeds over water, and over open habitats, using denser woodlands and forests for cover and reproduction (Warner and Czaplewski 1984).

#### SPECIES LIFE HISTORY

Activity Patterns: Nocturnal. Hibernates. Emerges at or shortly after, dusk, later than some other species (e.g., Myotis californicus, M. occultus, and Pipistrellus hesperus) (Jones 1965). This fairly cold-tolerant species hibernates during winter.

Seasonal Movements/Migration: Probably makes short migrations to suitable hibernacula.

The winter range is poorly known.

Home Range: No data found.

Territory: Often found in large colonies.

Reproduction: Mating occurs in the fall, and the young are born in June and July. Lactating females are found in July and August. The young may begin flying in mid-July. Year-old bats are capable of reproduction (Schowalter 1980). The maximum recorded longevity is 21 yr (Tuttle and Stevenson 1982).

Niche: The long-legged myotis is a small, direct-flying aerial insectivore, which seems to feed primarily on moths.

#### REFERENCES

- Barbour, R. W., and W. H. Davis. 1969. Bats of America. Univ. of Kentucky Press, Lexington. 286pp.
- Bell, G. P. 1980. Habitat use and response to patches of prey by desert insectivorous bats. Can. J. Zool. 58:1876-1883.
- Black, H. L. 1974. A north temperate bat community: structure and prey populations. J. Mammal. 55:138-157.
- Burt, W. H. 1934. The mammals of southern Nevada. Trans. San Diego Soc. Nat. Hist. 7:375-427.
- Dalquest, W. W. and M. C. Ramage. 1946. Notes on the long-legged bat (Myotis volans) at Old Fort Tejon and vicinity, California. J. Mammal. 27:60-63.
- Davis, W. B. 1960. The mammals of Texas. Texas Game and Fish Comm., Austin. 252pp.Davis, W. H., and R. W. Barbour. 1970. Life history data on some southwestern Myotis. Southwest. Nat. 15:261-263.
- Deacon, J. E., W. G. Bradley, and K. M. Larsen. 1964. Ecological distribution of the mammals of Clark Canyon, Charleston Mountains, Nevada. J. Mammal. 45:397-409.
- Fenton, M. B., and G. P. Bell 1979. Echolocation and feeding behavior in four species of Myotis (Chiroptera). Can. J. Zool. 57:1271-1277.
- Findley, J. S., A. H. Harris, D. E. Wilson, and C. Jones. 1975. Mammals of New Mexico. Univ. New Mexico Press. Albuquerque. 360pp.
- Geluso, K. N. 1978. Urine concentrating ability and renal structure of insectivorous bats. J. Mammal. 59:312-323.
- Jones, C. 1965. Ecological distribution and activity records of bats of the Mogollon Mountains area of New Mexico and adjacent Arizona. Tulane Studies Zool. 12:93-100.
- Schowalter, D. B. 1980. Swarming, reproduction, and early hibernation of Myotis lucifugus and M. volans in Alberta, Canada. J. Mammal. 61:350-354.
- Sumner, L., and J. S. Dixon. 1953. Birds and mammals of the Sierra Nevada. Univ. California Press, Berkeley. 484pp.
- Tuttle, M. D., and D. Stevenson. 1982. Growth and survival of bats. Pages 105-150 in T. H. Kunz, ed. Ecology of bats. Plenum Publ. Co., New York. 425pp.
- Vaughan, T. A. 1954. Mammals of the San Gabriel Mountains of California. Univ. Kans., Mus. Nat. Hist. Publ. 7:513-582.
- Warner, R. M., and N. J. Czaplewski. 1984. Myotis volans. Mammal. Species No. 224. 4pp.
- Whitaker, J. O., Jr., C. Maser, and L. E. Keller. 1977. Food habits of bats of western Oregon. Northwest Sci. 51:46-55.
- Whitaker, J. O., Jr., C. Maser, and S. P. Cross. 1981. Food habits of eastern Oregon bats, based on stomach and scat analyses. Northwest Sci. 55:281-292.

M027

Life history accounts for species in the California Wildlife Habitat Relationships (CWHR) System were originally published in: Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Updates are noted in accounts that have been added or edited since original publication.