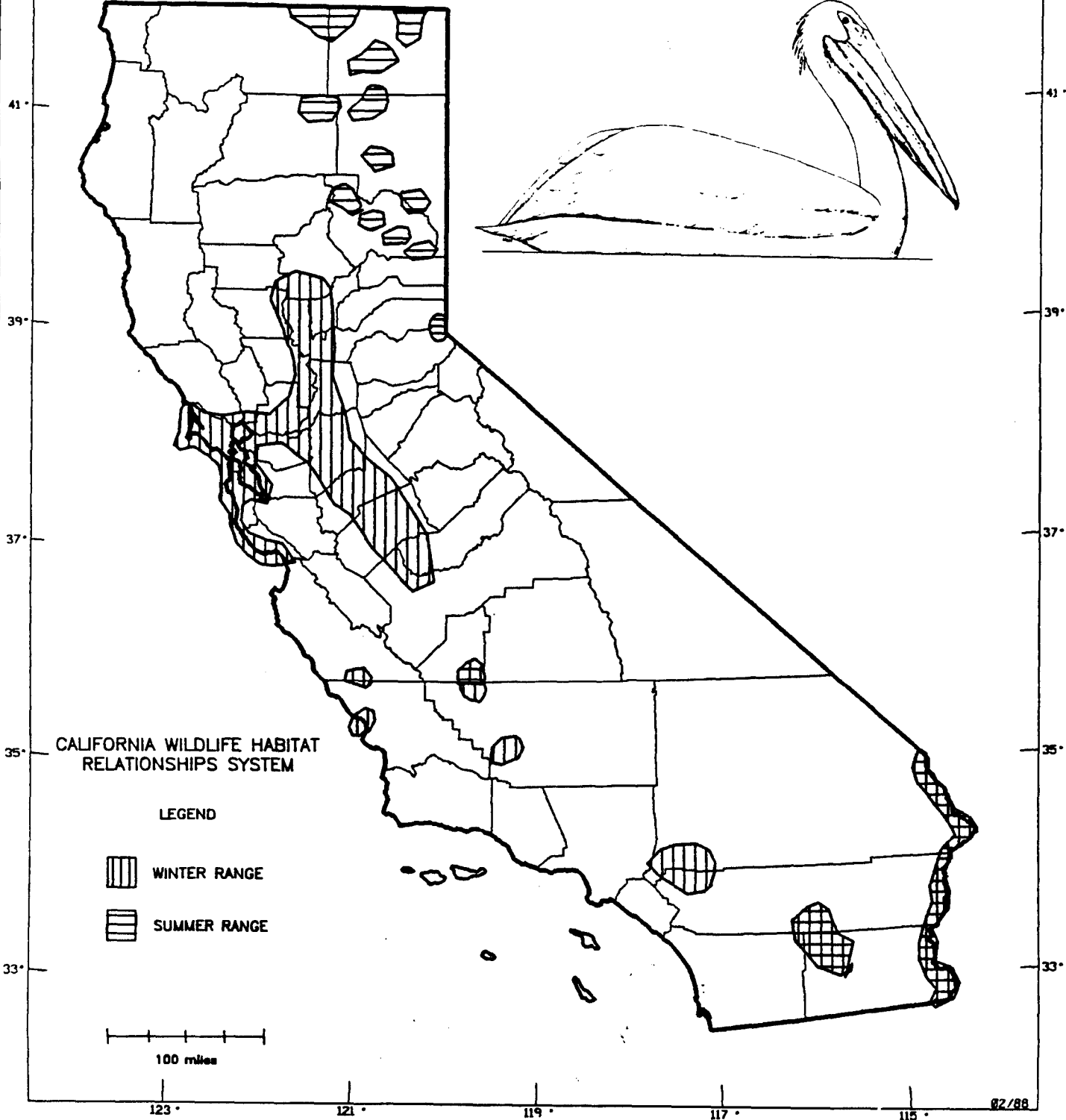


AMERICAN WHITE PELICAN

AUTHORSHIP

Species Note Prepared By: S. L. Granholm
Species Note Edited By: R. Duke
Species Note Reviewed By: D. G. Raveling



B044 Double-crested Cormorant *Phalacrocorax auritus*

Family: Phalacrocoracidae Order: Pelecaniformes Class: Aves Date: June 28, 1983
Management Status: California Species of Special Concern

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A yearlong resident along the entire coast of California and on inland lakes, in fresh, salt and estuarine waters. August to May, fairly common to locally very common along the coast and in estuaries and salt ponds; uncommon in marine subtidal habitats from San Luis Obispo Co. south, and very rare to the north. In the same season, fairly common at the Salton Sea and Colorado River reservoirs, and rare to fairly common in lacustrine and riverine habitats of the Central Valley and coastal slope lowlands. Less common in summer, except locally common near nesting colonies.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds mainly on fish (Robertson 1974, Cogswell 1977); also on crustaceans and amphibians. Dives from water surface and pursues prey underwater, usually remaining submerged for about 30 sec. Prefers water less than 9 m (30 ft) deep with rocky or gravel bottom, but may catch fish as deep as 22 m (72 ft). Sometimes feeds cooperatively in flocks of up to 600, often with pelicans.

Cover: Rests in daytime and roosts overnight beside water on offshore rocks, islands, steep cliffs, dead branches of trees, wharfs, jetties, or even transmission lines. Perching sites must be barren of vegetation (Bartholomew 1943). Must visit perches periodically in day to dry plumage. Sometimes rests, or even sleeps, on water in daytime (Palmer 1962). Requires considerable length of water, or elevated perch, for labored take-off.

Reproduction: Requires undisturbed nest-sites beside water, on islands or mainland. Uses wide rock ledges on cliffs; rugged slopes; and live or dead trees, especially tall ones.

Water: No additional data found.

Pattern: Suitable nest-site must be within 8-16 km (5-10 mi) of dependable food supply (Palmer 1962).

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity, except migrates both day and night.

Seasonal Movements/Migration: Summer residents of mountains and northeastern plateau are absent from about November to March; presumably migrate west and south to lowlands, especially along the coast, where the population increases in winter.

Home Range: Usually forages within 8-16 km (5-10 mi) of roost or nest colony (Palmer 1962). In Manitoba, ground nests on islands averaged 1 per 0.8 m² (9 ft²) (McLeod and Bondar 1953).

Territory: Used for some courtship displays, copulation, and nesting; consists of nest, and a perch for the non-incubating parent (Palmer 1962). In Saskatchewan, ground nests on islands were 22-38 cm (8.5-15 in) in diameter, and ranged from 0-91 cm (0-36 in) apart, measured from rim to rim (Vermeer 1970a).

Reproduction: Breeds mostly April to July or August, but begins in January at Salton Sea and Colorado River. Most laying is April to June. Monogamous; nests in colonies of a few to hundreds of pairs, or even thousands; little current information on sizes of California colonies. Clutch size usually 3-4, range 2-7, possibly as high as 9. Single-brooded. Incubation 24.5-29 days. Altricial young tended by both parents, first fly at 5-6 wk, fully independent at 10 wk. Usually breed first at 3 yr, sometimes 2 yr. About 25% of adults at breeding colonies are prebreeders (Lewis 1929, Mendall 1936).

Niche: Susceptible to reduced nesting success from persistent pesticides in water. Many nesting colonies in California have been abandoned after human disturbance and habitat destruction (Remsen 1978). In Quebec, human disturbance of breeding colonies caused nest abandonment and increased predation by gulls on eggs and young (Ellison and Cleary 1978). Predation on eggs and young by gulls and crows may be an important factor reducing nesting success (Ellison and Cleary 1978, Siegel-Causey and Hunt 1981).

Comments: A California Species of Special Concern (Remsen 1978). Numbers declining throughout North America.

REFERENCES

Lewis 1929, Mendall 1936, Bartholomew 1943, McLeod and Bondar 1953, Palmer 1962, Vermeer 1970a, Robertson 1974, Cogswell 1977, Ellison and Cleary 1978, Remsen 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981, Siegel-Causey and Hunt 1981.

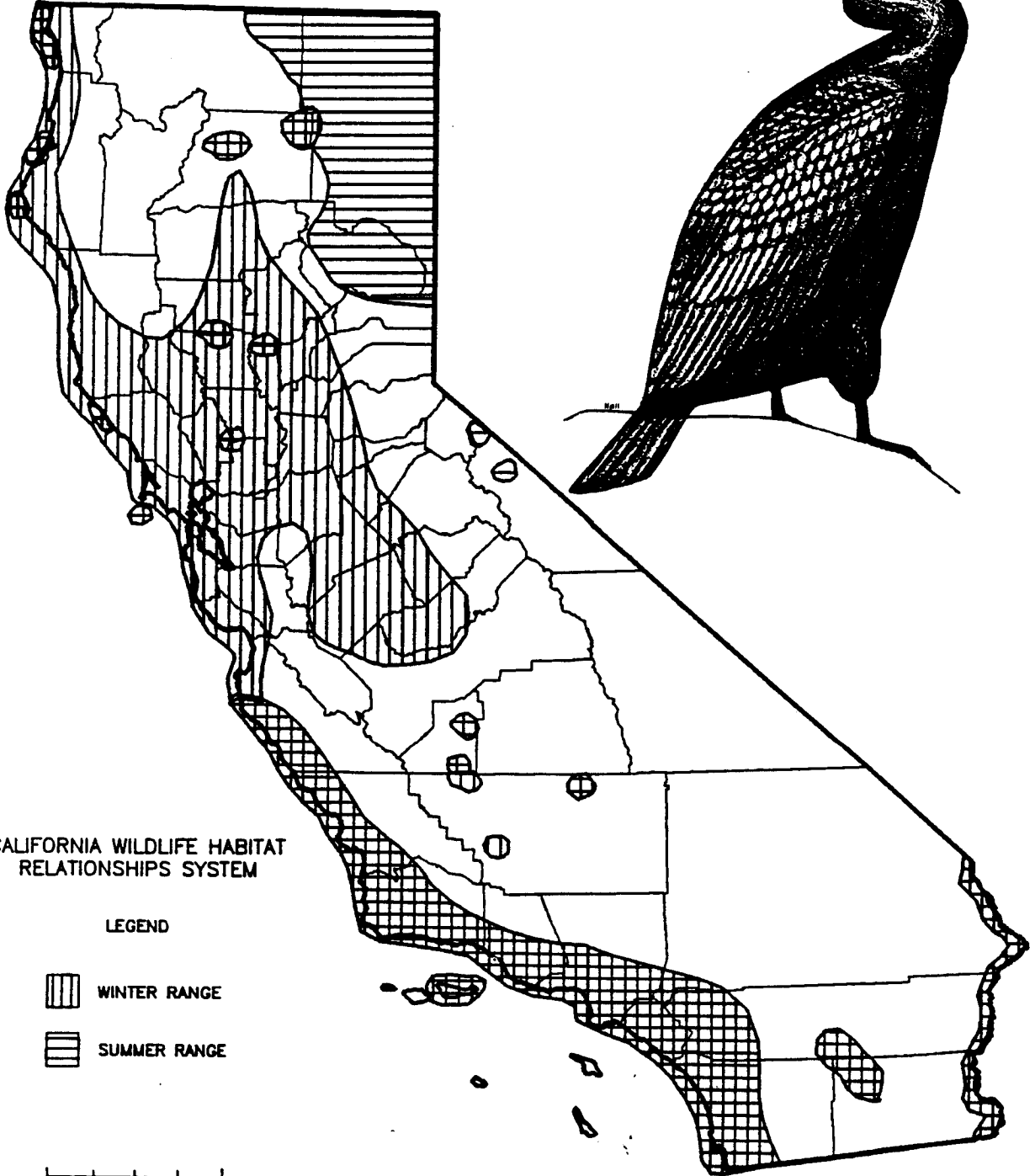
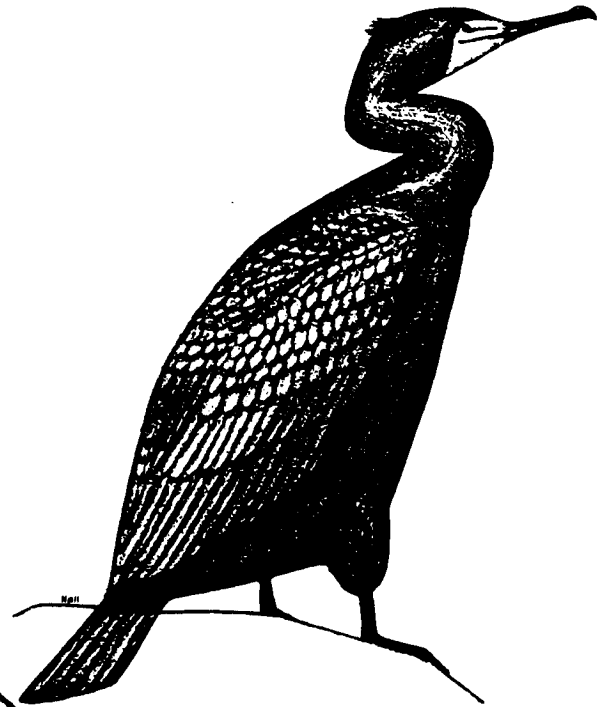
DOUBLE-CRESTED CORMORANT

AUTHORSHIP

Species Note Prepared By: S. L. Granholm

Species Note Edited By: R. Duke

Species Note Reviewed By: D. G. Raveling



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B050 Least Bittern *Ixobrychus exilis*

Family: Ardeidae Order: Ciconiiformes Class: Aves Date: June 28, 1983

Management Status: California Species of Special Concern

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

In southern California, common summer resident (especially April to September), at Salton Sea and Colorado River, in dense emergent wetlands near sources of freshwater, and in desert riparian (saltcedar scrub). Probably nests only in emergent wetlands. Uncommon through winter in some locations; quite rare in deserts and coastal lowlands, but may breed locally (Garrett and Dunn 1981). Rare to uncommon April to September in large, fresh emergent wetlands of cattails and tules in Central Valley, where it nests; and on northeast plateau, where it probably nests (Cogswell 1977, McCaskie *et al.* 1979). Distributional data are scant because of extremely secretive behavior. More studies are needed.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats mainly small fishes, aquatic and terrestrial insects, and crayfish; also amphibians, small mammals, and miscellaneous invertebrates. Stalks or stands motionless in shallow water, then quickly strikes prey, in water or on emergent vegetation; hunts in small openings in dense, emergent vegetation; moves on to new pool after each capture (Palmer 1962); at Salton Sea and Colorado River, also may feed in adjacent thickets of saltcedar. Often feeds on the open-water side of emergent vegetation, using vegetation stalks as stepping-stones (Weller 1961).

Cover: Rests, roosts, and hides in dense, emergent vegetation and, at Salton Sea and Colorado River, in adjacent thickets of saltcedar in desert riparian habitat.

Reproduction: Nests, made of dried and living plants, are built low in tules or cattails, usually above water level. Usually over water 0.3 m (1 ft), or more, deep (Cogswell 1977). Usually near open water, or a small opening in vegetation (Weller 1961).

Water: No additional data found.

Pattern: Uses dense, emergent vegetation for cover and nesting, and feeds in such vegetation, as well as in small openings. Often feeds along the edge of emergent vegetation, on the open-water side.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal or circadian activity. Feeds in daytime, but not known if it feeds at night as does American bittern. Migrates nocturnally (Terres 1980).

Seasonal Movements/Migration: Most of California population migrates south to Mexico for winter (mainly October to March). Part of population in southern California apparently is nonmigratory.

Home Range: Reported nest densities include: 15 nests in 0.8 ha (2 ac) of marsh in Michigan (Wood 1951), 26 nests in 26 ha (65 ac) (Beecher 1942), and 19 nests in an 18 ha (44 ac) marsh in Iowa (Palmer 1962).

Territory: Defends nesting territory, but size unknown.

Reproduction: Based on limited data, apparently arrives on California breeding ground late March to May, lays eggs mid-April to early July. Probably monogamous; nests solitarily, but sometimes in high densities in good habitat. Clutch size usually 4-5, range 2-7 (Weller 1961). Apparently double-brooded, at least in Iowa. Incubation 19-20 days (Weller 1961). Semi-altricial young, tended by both parents, sometimes until 26 days old. Ages at first flight, independence, and first breeding unknown (Palmer 1962).

Niche: Marsh wren has been seen puncturing eggs of this species (Bent 1926). Turtles sometimes eat young (Weller 1961). Populations have declined from marsh drainage, human disturbance, and pesticides (Palmer 1962, Arbib 1979). Because of nocturnal migration at low altitude, frequently killed, or injured, by collisions with obstacles such as TV towers (Terres 1980).

Comments: A California Species of Special Concern (Remsen 1978).

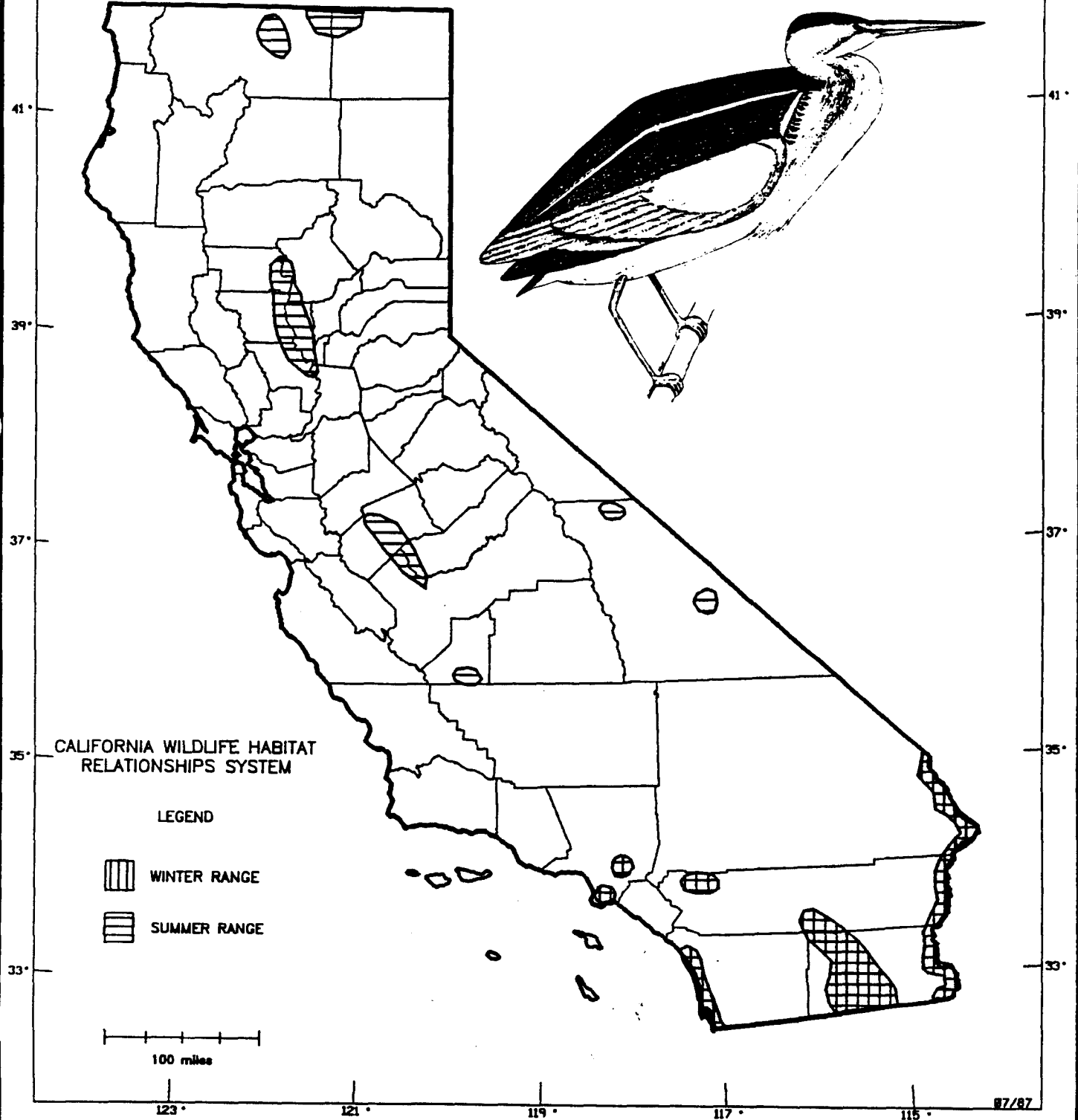
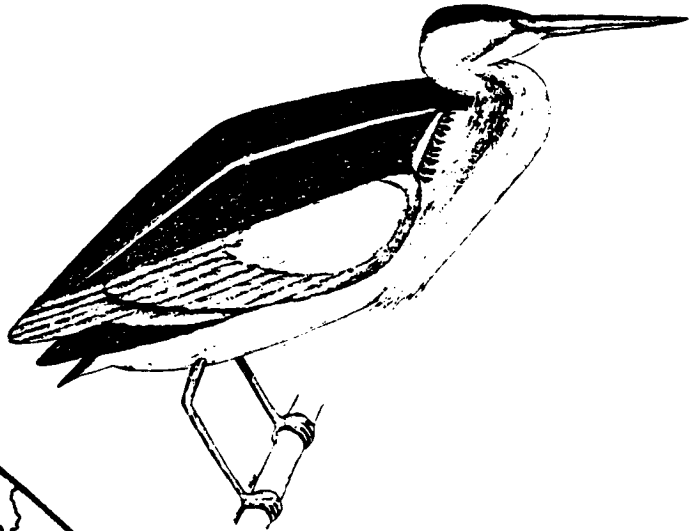
REFERENCES

Bent 1926, Beecher 1942, Wood 1951, Weller 1961, Palmer 1962, Cogswell 1977, Remsen 1978, Arbib 1979, McCaskie *et al.* 1979, Terres 1980, Garrett and Dunn 1981.

LEAST BITTERN


AUTHORSHIP

Species Note Prepared By: S. L. Granholm
Species Note Edited By: R. Duke
Species Note Reviewed By: D. G. Raveling



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

87/87

♂131 Prairie Falcon *Falco mexicanus*

Family: Falconidae Order: Falconiformes Class: Aves

Management Status: California Species of Special Concern Date: March 4, 1982

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon permanent resident and migrant that ranges from southeastern deserts northwest along the inner Coast Ranges and Sierra Nevada. Distributed from annual grasslands to alpine meadows, but associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. Not found in northern coastal fog belt, or along the coastline.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats mostly small mammals, some small birds, and reptiles. Catches prey in air and on ground in open areas. Dives from a perch with rapid pursuit, or dives from searching flight 15-90 m (50-300 ft) above ground.

Cover: Requires sheltered cliff ledges for cover.

Reproduction: Usually nests in a scrape on a sheltered ledge of a cliff overlooking a large, open area. Sometimes nests on old raven or eagle stick nest on cliff, bluff, or rock outcrop. Aerial courtship display occurs near nest site. Southeast-facing nest site apparently preferred, but height and orientation secondary to nature and character of the ledge.

Water: Denton (1975) reported 76% of eyries had water within 0.4 km (0.25 mi). Reported bathing (Skinner 1983a).

Pattern: Uses open terrain for foraging; nests in open terrain with canyons, cliffs, escarpments, and rock outcrops.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Much time spent perching near eyrie. Forages mostly early morning and late afternoon except when feeding nestlings or prey scarce.

Seasonal Movements/Migration: Migrants from north winter in California. Some residents wander upslope in summer and downslope for winter.

Home Range: Home range of a breeding pair was 26 km² (10 mi²) in Wyoming (Craighead and Craighead 1956).

Territory: Territory and home range probably the same. Intensively defends territory. Breeding territory was 5.7 to 6.5 km² (2.2 to 2.5 mi²) in Utah (Smith and Murphy 1973). Active nests have been recorded within 200 m (636 ft) of one another (Enderson 1964, Garrett and Mitchell 1973), in sites where individuals did not confront or see each other regularly. Thus, relative orientation of potential nest site probably more important than actual distance from another potential site.

Reproduction: Breeds from mid-February through mid-September, with peak April to early August. Clutch size 3-6 eggs, average 5. Mean laying date for 280 records 1900-1977 was April 4-11 (Walton 1977). Fledging success over 5 yr for 135 nests averaged 3.2 young, ranging 0-5; 19% of the nests had 5 young (Walton 1977). Young begin to disperse in June and July. May live as long as 13-20 yr (Enderson 1969, Denton 1975).

Niche: Vulnerable to DDE poisoning. Egg and nestling predation occurs at sites accessible to mammal predators, great horned owls, and golden eagles. May compete with red-tailed hawks for food and nest sites, and with great horned owls and ravens for nest sites.

Comments: A California Species of Special Concern (Remsen 1978).

REFERENCES

Skinner 1938a, Craighead and Craighead 1956, Enderson 1964, 1969, Brown and Amadon 1968, Garrett and Mitchell 1973, Smith and Murphy 1973, Snow 1974b, Denton 1975, Walton 1977, Remsen 1978, U.S. Bureau of Land Management 1979.

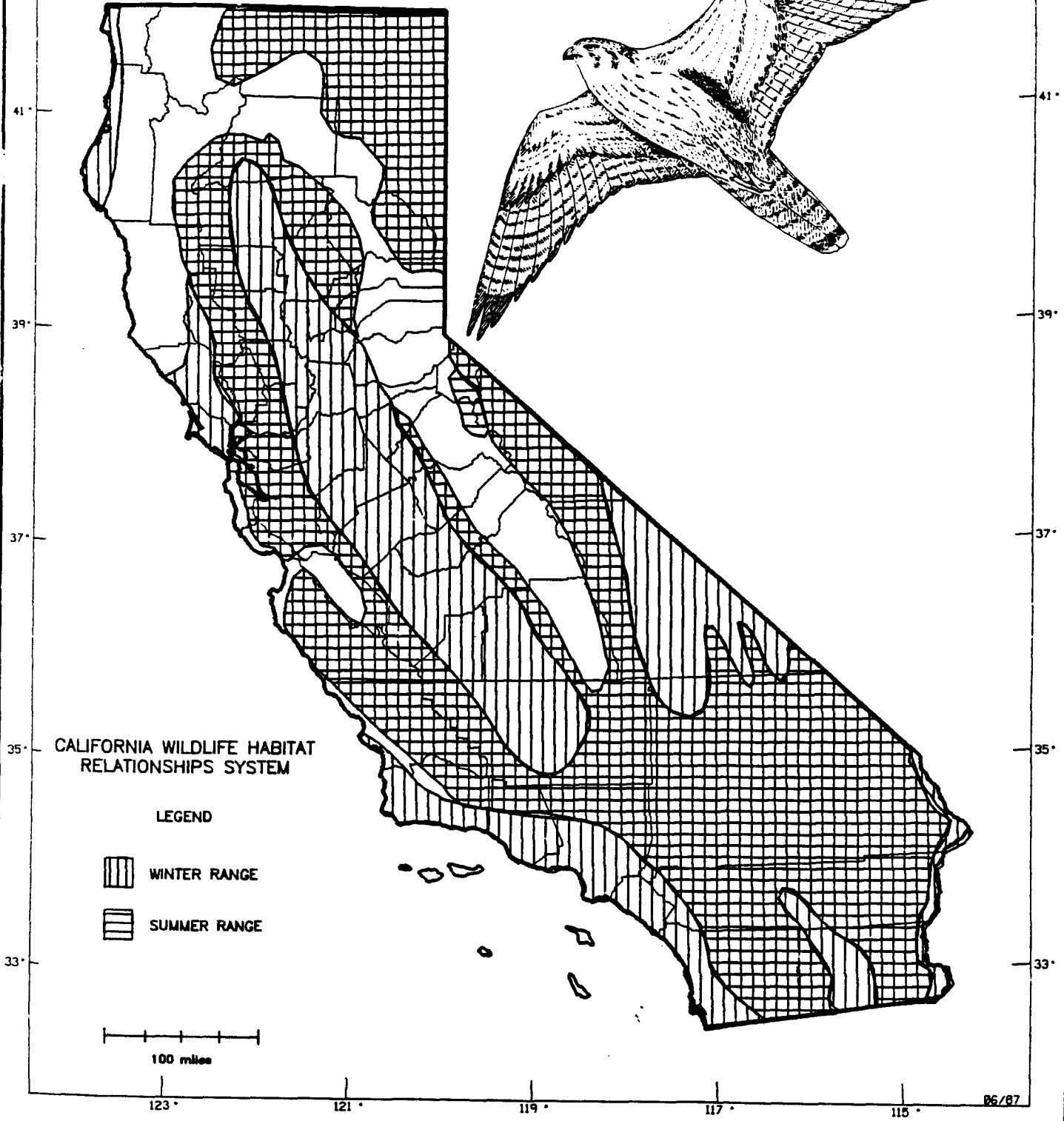
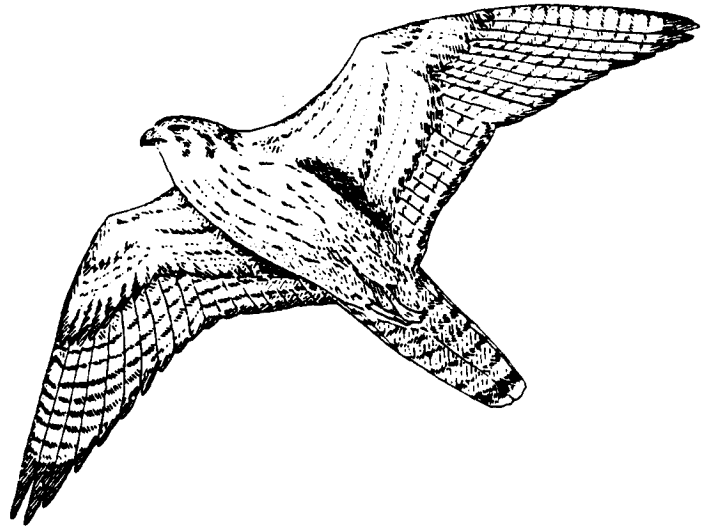
PRAIRIE FALCON

AUTHORSHIP

Species Note Prepared By: C. Polite, J. Pratt



Species Note Edited By: L. Kiff

Species Note Reviewed By: L. Kiff



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

86/87

B227 Caspian Tern *Sterna caspia*

Family: Laridae Order: Charadriiformes Class: Aves Date: March 22, 1984

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Common to very common along the California coast and at scattered locations inland, from April through early August. Nests in dense colonies on sandy estuarine shores, on levees in salt ponds, and on islands in alkali and freshwater lakes (Small 1974, Cogswell 1977). Breeding adult often flies substantial distances to forage in lacustrine, riverine, and fresh and saline emergent wetland habitats (Gill 1976). Nesting colonies are located at south San Francisco Bay, San Diego Bay, and several lakes in Modoc and Lassen cos. (Cogswell 1977, Garrett and Dunn 1981). Small colonies recently reported on Humboldt Bay, San Pablo Bay, and Elkhorn Slough, Monterey Co. (Gill and Mewaldt 1983). An analysis of banding recoveries indicates a shifting from nesting in numerous small colonies associated with freshwater marshes in interior California, to nesting in large colonies on human-created habitats along the coast (Gill and Mewaldt 1983). Large numbers are present at the Salton Sea in the breeding season, but nesting no longer occurs there. This species winters from southern California, where it is locally fairly common, south to Central and South America. Scattered individuals have been noted in winter along the central and northern California coast.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds primarily on small fish in freshwater lakes, estuaries, and salt ponds. Sometimes feeds over the open ocean, near shore (Cogswell 1977). Searches aerially, hovers, and dives just below water surface for prey. Fish as long as 15 cm (6 in) are taken (Cogswell 1977).

Cover: Groups rest on mudflats, boardwalks, lake shores, pilings, small islands, or occasionally on open sand beaches.

Reproduction: Nests in dense colonies on undisturbed islands, levees, or shores. Nests are scraped, unlined depressions in soil near water. Barren, or nearly barren, sites are preferred.

Water: No requirement for fresh water has been reported.

Pattern: For nesting, requires relatively barren, undisturbed islands, levees, or shores, and nearby foraging areas in lakes, estuaries, salt ponds, or emergent wetlands.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, primarily diurnal activity. Nesting colonies are active at night.

Seasonal Movements/Migration: Breeding population disperses widely before migrating south. Arrives at wintering grounds in late September to early October (Bent 1921), returns in late March or April.

Home Range: Although most adults probably forage near the colony, Gill (1976) reported finding tagged trout in nests, which only could have been obtained 29-60 km (18-37 mi) from the colony. The largest colony on San Francisco Bay saltpond dikes held 499 nets in 1954. It declined thereafter, and was abandoned by 1970, by which time 3 other colonies were established.

Territory: Small territories are established around densely grouped nests; territory varied from 1.0 to 1.4 m² (10.8 to 15.3 ft²) in the Great Lakes region (Ludwig 1965).

Reproduction: The breeding season begins in April, peaks May through July, and extends well into August. Average clutch size ranged from 2.8 in the Great Lakes region (Ludwig 1965) to 2.0 in San Francisco Bay (Gill 1973). Incubation period is 20 days (Bent 1921). Both sexes incubate eggs and care for young. Adults continue to feed young for weeks, or months (Cogswell 1977). The semiprecocial young wander widely after 2 wk. First breeding probably occurs in the 3d yr.

Niche: Although Gill (1973) noted the presence of ring-billed gulls, California gulls, and black-crowned night-herons near a large colony of nesting Caspian terns, any attempt at predation by these species was thwarted by colony-wide mobbing of intruders. At one colony, Caspian terns nesting in close proximity to least terns were credited with protecting the least terns by interspecific cooperation in mobbing predators (Anderson and Rigney 1980).

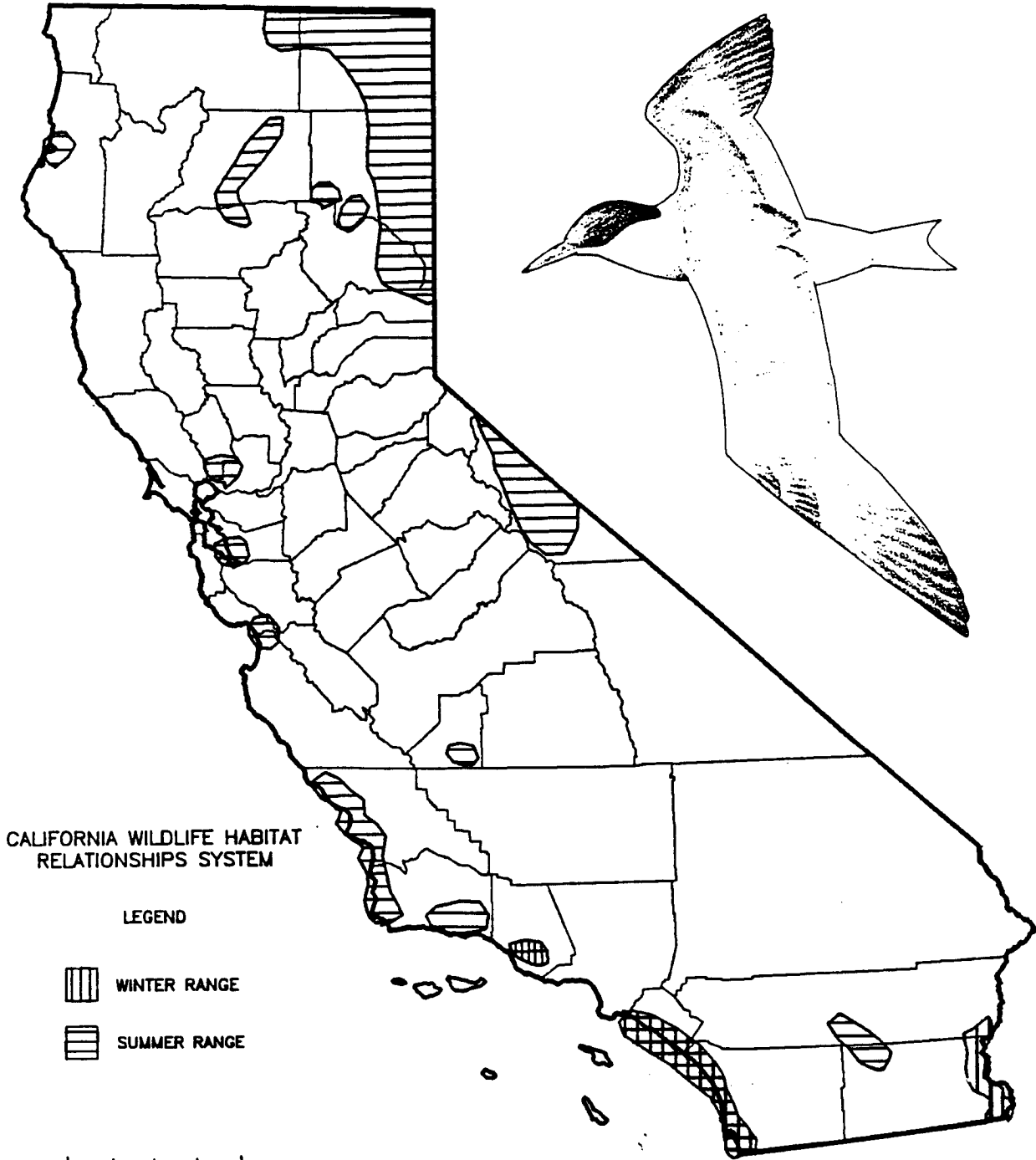
REFERENCES

Bent 1921, Ludwig 1965, Gill 1973, 1976, 1977, Small 1974, Cogswell 1977, Gill and Mewaldt 1979, 1983, Anderson and Rigney 1980, Garrett and Dunn 1981.

CASPIAN TERN

AUTHORSHIP

Species Note Prepared By: M. Rigney, S. L. Granholm
Species Note Edited By: R. Duke
Species Note Reviewed By: H. L. Cogswell



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

94/87

B235 Black Tern *Chlidonias niger*

Family: Laridae Order: Charadriiformes Class: Aves Date: March 23, 1984

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Formerly a very common spring and summer visitor to fresh emergent wetlands of California (Grinnell and Miller 1944). Numbers have declined throughout the range, especially in the Central Valley (Cogswell 1977). Currently fairly common migrant and breeder on wetlands of the northeastern plateau area, but absent from some historic nesting localities, such as Lake Tahoe (Cogswell 1977). Despite the presence of apparently suitable habitat in rice farming areas, breeding is questionable in the Central Valley (Gaines 1974). Fairly common in spring and summer at the Salton Sea, but evidence of nesting there is lacking (Garrett and Dunn 1981). Although restricted to freshwater habitats while breeding, can be fairly common on bays, salt ponds, river mouths, and pelagic waters in spring and fall migration (Grinnell and Miller 1944, Cogswell 1977).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Forages by hovering above wet meadows and fresh emergent wetlands. Catches insects in air; also plucks them from water and vegetation surfaces. Eats grasshoppers, dragonflies, moths, flies, beetles, crickets, and other insects (Terres 1980). Also hovers above croplands, then drops to capture adult and larval insects from recently plowed soil. Another foraging technique is plunging to water surface for tadpoles, crayfish, small fish, and small mollusks. Young are fed insects (Cuthbert 1954).

Cover: Often nests in dense wetland vegetation.

Reproduction: Nest is a loose mass of dead plant stems, anchored to standing vegetation or floating on the water surface. On dry ground, a hollow scrape lined with fine plant matter is used, and also takes over abandoned muskrat houses and coot and grebe nests (Bent 1921, Harrison 1978). Dikes in rice fields also may be used where available (Cogswell 1977).

Water: Needs fresh water while breeding, but also frequents salt water in migration (Grinnell and Miller 1944).

Pattern: Uses fresh emergent wetlands, lakes, ponds, moist grasslands, and agricultural fields. In migration, some take coastal routes and forage offshore.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Forages in daylight hours with erratic flight and frequent hovering (Bent 1921, Pough 1951).

Seasonal Movements/Migration: Long distance migrant that winters off the coast of northwestern South America. Spring migration takes place in April and May, and fall migration extends from late June through September, but stragglers have been reported in all months in California (Cogswell 1977).

Home Range: No additional data found.

Territory: At Eagle Lake, Gould (1974) recorded nests averaging 8.5 m (28 ft) apart, and ranging 3.7-20 m (12-66 ft) apart, within colonies. In Michigan, Cuthbert (1954) recorded nests 9.1-805 m (30-2640 ft) apart; within colonies, most nests were less than 30.5 m (100 ft) apart. Cuthbert (1954) stated that most food was obtained within "a few hundred yards" of the nest. After the young fledged, "large" feeding territories, containing 3-4 perches for young, were established and defended by both parents and young.

Reproduction: The breeding season extends from May through late August with a peak in June and July. Loosely colonial; Usually 3 eggs in clutch (range 2-4) (Harrison 1978). Single-brooded; incubation is by both sexes, lasting 20-22 days. Young are semiprecocial, and are tended by both parents. Young remain near the nest for about 2 wk, start to fly at 3 wk, and are fully fledged at 4 wk (Harrison 1978).

Niche: Loss of wetlands in the Central Valley has been mitigated in part by rice farming, which provides potential foraging and nesting sites (Grinnell and Miller 1944). Highly vulnerable to destruction of natural wetlands by drainage, or heavy grazing. Pesticide pollution of many agricultural areas also has been extremely detrimental. Campgrounds and marinas on the shorelines of large lakes and wetlands also may be partially responsible for population decline (Marcot 1979).

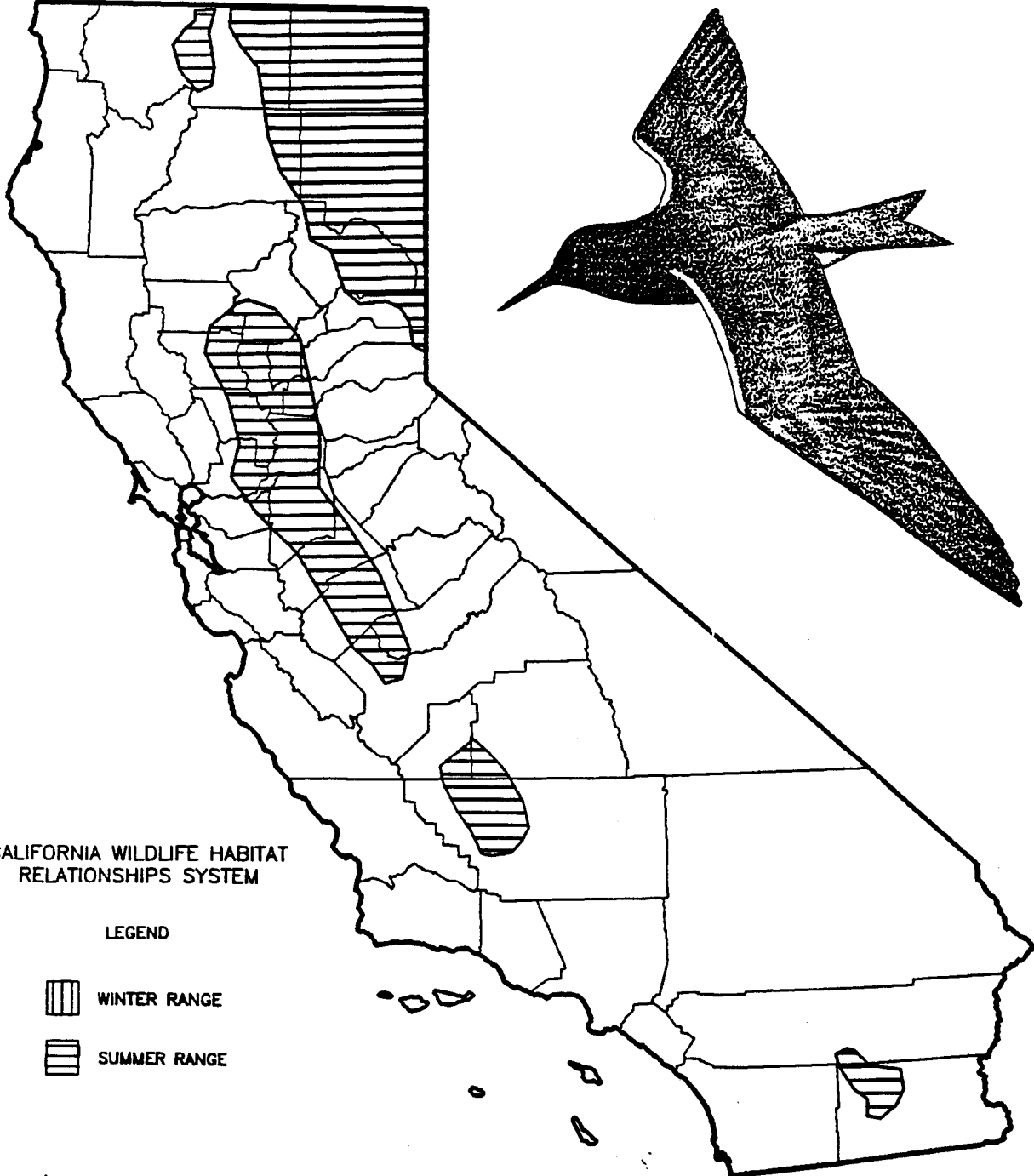
REFERENCES

Bent 1921, Grinnell and Miller 1944, Pough 1951, Cuthbert 1954, Gaines 1974, Gould 1974, Cogswell 1977, Harrison 1978, Marcot 1979, Terres 1980, Garrett and Dunn 1981.

BLACK TERN

AUTHORSHIP

Species Note Prepared By: E. C. Beedy
Species Note Edited By: R. Duke
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B262 Barn Owl *Tyto alba*

Family: Tytonidae Order: Strigiformes Class: Aves Date: March 4, 1982

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Common, yearlong resident in open habitats including grassland, chaparral, riparian, and other wetlands. Occurs throughout the state from sea level to 1680 m (0-5500 ft), avoiding dense forests and open desert habitats. Often found in vicinity of human communities (Grinnell and Miller 1944). Resident of all Channel Islands except San Nicolas (Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds primarily upon mice, rats, voles, pocket gophers, and ground squirrels. Also eats shrews, insects, crustaceans, reptiles, and amphibians. Small birds, such as blackbirds, important food in winter. Hunts on the wing, from a perch, hovers, stoops, in open fields, wetlands, and grasslands.

Cover: Dense foliage of trees and shrubs, buildings, and cliffs used for roosting cover.

Reproduction: Usually nests on ledges, crevices, or other sheltered areas of cliffs or human-made structures. Also nests in cavities in trees or snags, burrows, culverts, or nest boxes (Reese 1972, Call 1978).

Water: Most water needs apparently met by food.

Pattern: Uses open habitats for hunting near cliffs, ledges, human-made structures, or trees or snags, which provide roost and nest sites.

SPECIES LIFE HISTORY

Activity Patterns: Active yearlong. Primarily a nocturnal hunter, with limited crepuscular activity.

Seasonal Movements/Migration: Not migratory.

Home Range: Pair retains roughly the same home range throughout the year. Evans and Emlen (1947) reported a hunting range of about 67 ha (165 ac) near Davis. Minimum home range in Oregon was estimated to be 2.0 km² (0.8 mi²) per pair (Thomas 1979).

Territory: In Utah, an area 5-9 m (15-30 ft) around the nest was defended (Smith *et al.* 1974).

Reproduction: Monogamous; most breeding occurs January through November. Clutch size 3-11, usually 5-7. Often produces 2 broods per yr. Brood size averaged 2.8 to 4.7 in southern California (Henny 1969). Gallup (1949) found a mean of 4.2 young per nest from 1928-1946 in San Diego Co. Incubation 21-24 days (Bent 1938, Smith *et al.* 1974); young fledge at 52-70 days (Pickwell 1948). Male feeds female during incubation; male and female brood. Clutch size and fledging success apparently affected by prey availability and severity of preceding winter.

Niche: Predators of young include prairie falcons, great horned owls, and golden eagles (Bent 1938, Carnie 1954). Great horned owls apparently are strong competitors for food in some areas (Smith and Marti 1976).

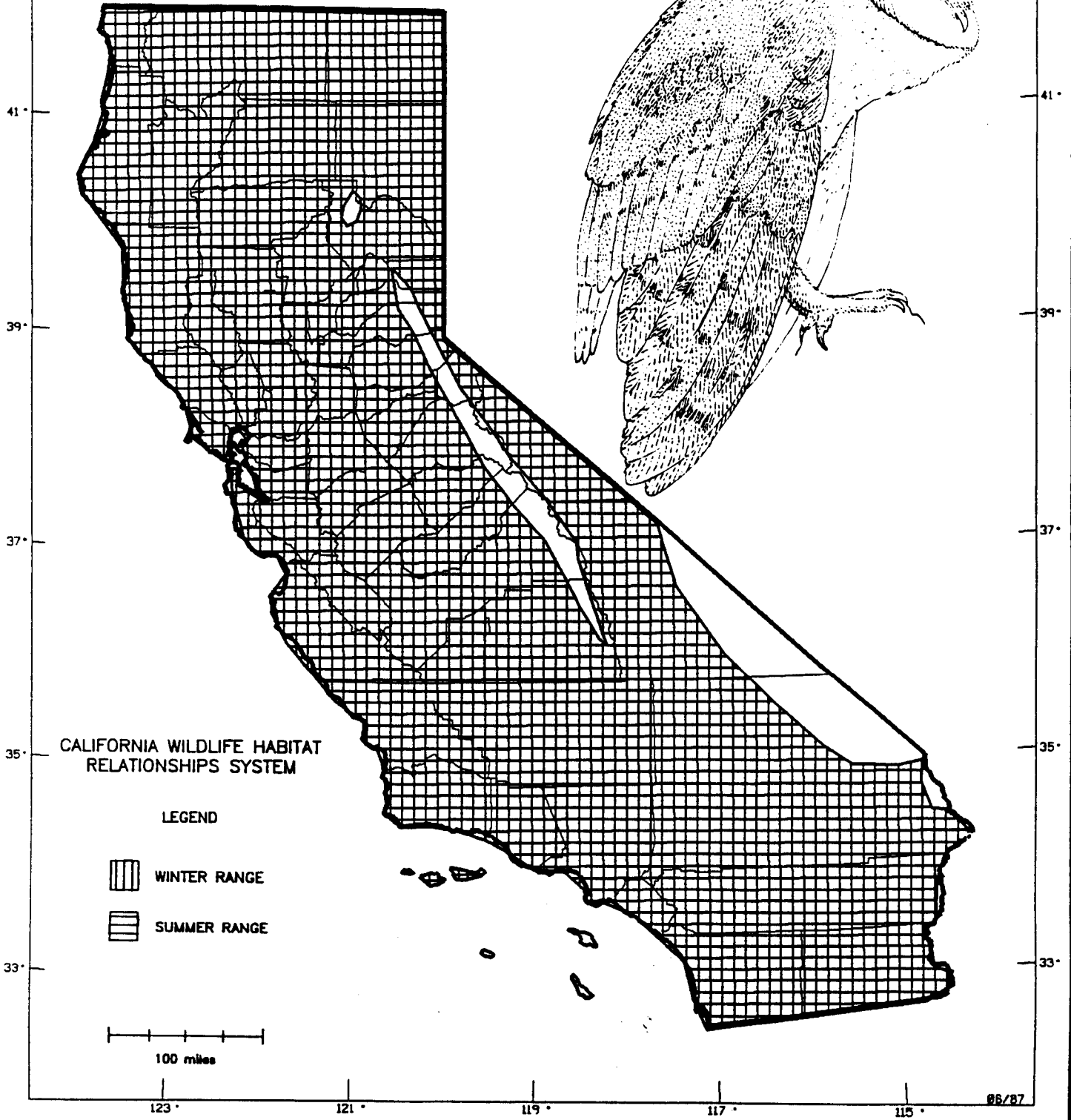
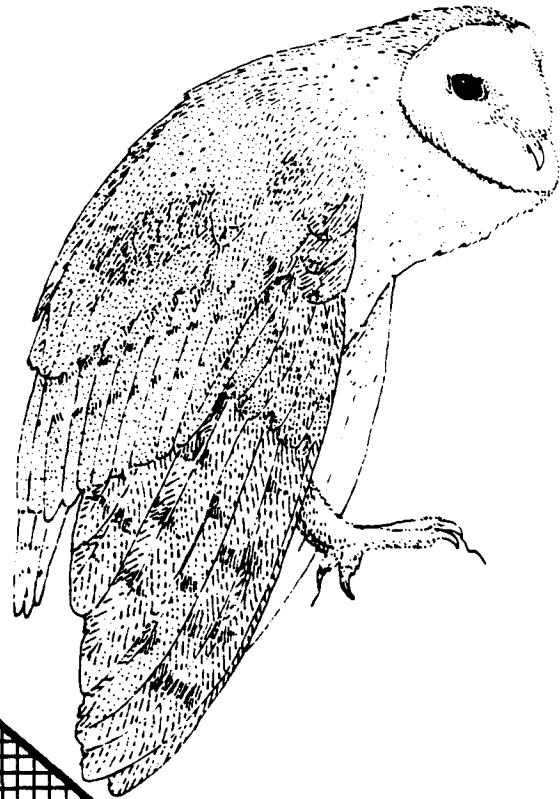
REFERENCES

Bent 1938, Grinnell and Miller 1944, Evans and Emlen 1947, Pickwell 1948, Gallup 1949, Carnie 1954, Craighead and Craighead 1956, Guiguet 1960, Payne 1962, Henny 1969, Reese 1972, Karalus and Eckert 1974, Marti 1974, Smith *et al.* 1974, Smith and Marti 1976, Udvardy 1977, Call 1978, Bertrand and Scott 1979, Thomas 1979, Bloom 1979, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

BARN OWL

AUTHORSHIP

Species Note Prepared By: C. Polite
Species Note Edited By: L. Kiff
Species Note Reviewed By: L. Kiff



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

88/87

3272 Long-eared Owl *Asio otus*

Family: Strigidae Order: Strigiformes Class: Aves

Management Status: California Species of Special Concern Date: March 4, 1982

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon resident or winter visitant throughout most of the northern part of the state, excluding the humid North Coast Range, Cascade Range, and higher elevations of the Sierra Nevada. Winter visitant of tamarisk and other tree stands in the Mojave Desert, and a very rare winter migrant along the southern coastline. Uncommon local resident of Owens Valley, Fish Lake Valley, and numerous wooded washes and oases throughout southeastern California (Garrett and Dunn 1981). Riparian habitat required; also uses live oak thickets and other dense stands of trees. Resident populations in the state have been declining since the 1940s, especially in southern California (Grinnell and Miller 1944, Remsen 1978). All reasons for decline not known, but destruction and fragmentation of riparian habitat and live oak groves have been major factors (Remsen 1978).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats mostly voles and other rodents, occasionally birds, including smaller owls, and other vertebrates. Searches for prey in low, gliding flight; pounces on prey on ground. Usually hunts in open areas, occasionally in woodland and forested habitats.

Cover: Riparian or other thickets with small, densely canopied trees required for roosting and nesting.

Reproduction: Uses old crow, magpie, hawk, heron, and squirrel nest in a variety of trees with dense canopy. Nest usually 3-15 m (10-50 ft) above ground, rarely on ground or in tree or snag cavity (Karalus and Eckert 1974). Breeds from valley foothill hardwood up to ponderosa pine habitats.

Water: No additional data found.

Pattern: Frequents dense, riparian and live oak thickets near meadow edges, and nearby woodland and forest habitats. Also found in dense conifer stands at higher elevations.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, nocturnal activity (Marti 1976).

Seasonal Movements/Migration: Apparently makes only local movements in California, although some migration may occur. Often congregates in winter flocks, perhaps including family groups. May be seasonal movement westward from Sierra Nevada foothills in fall. Small (1974) reported irregular wandering of groups in winter.

Home Range: In Wyoming, breeding home range in riparian habitat varied from 34-106 ha (83-262 ac), and averaged 51 ha (134 ac) (Craighead and Craighead 1956).

Territory: No data found.

Reproduction: Breeding extends from early March to late July. One brood per yr from a clutch of 3-8 eggs, usually 4-5. Eggs usually laid in April and May; incubation 21-28 days, by female; male feeds. Nestlings fledge in about 50 days or less. Approximately 93% of eggs resulted in fledged young in Wyoming (Craighead and Craighead 1956). May nest in loose colonies.

Niche: Northern harriers may compete for prey; red-shouldered hawks may compete for nest sites (Wilson 1938). Great horned owls may prey on young.

Comments: A California Species of Special Concern (Remsen 1978).

REFERENCES

Bent 1938, Wilson 1938, Grinnell and Miller 1944, Randle and Austing 1952, Craighead and Craighead 1956, Armstrong 1958, Guiguet 1960, Karalus and Eckert 1974, Small 1974, Marti 1974, 1976, Udvardy 1977, Call 1978, Remsen 1978, Bertrand and Scott 1979, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

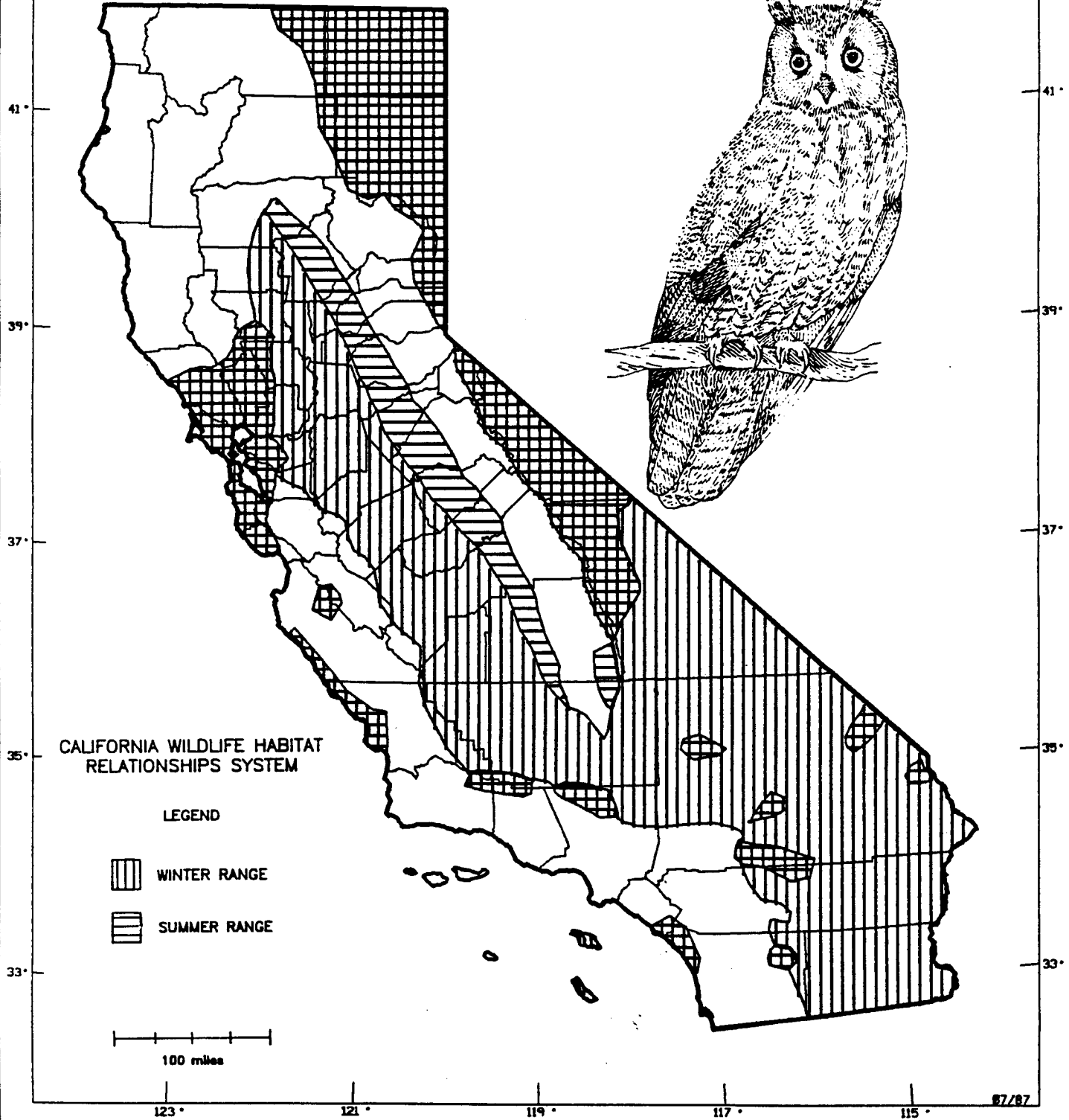
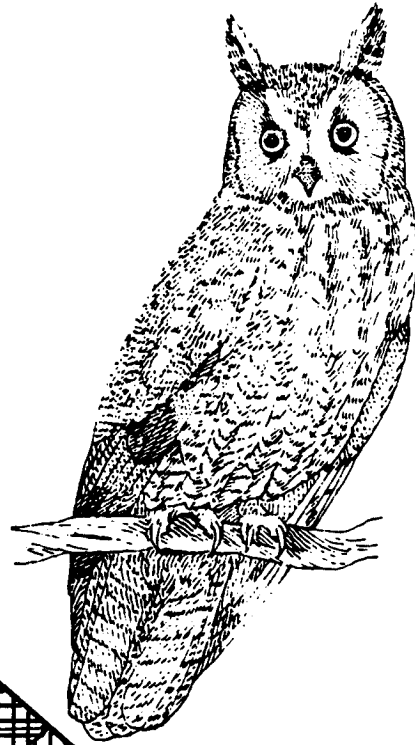
LONG-EARED OWL

AUTHORSHIP

Species Note Prepared By: C. Polite

Species Note Edited By: L. Kiff

Species Note Reviewed By: L. Kiff



B273 Short-eared Owl *Asio flammeus*

Family: Strigidae Order: Strigiformes Class: Aves

Management Status: California Species of Special Concern Date: March 4, 1982

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Formerly a resident locally the length of the state, excluding higher mountains. A widespread winter migrant, found primarily in the Central Valley, in the western Sierra Nevada foothills, and locally in the southern desert region. An uncommon winter migrant in southern California, including the Channel Islands (Garrett and Dunn 1981). Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Occasionally still breeds in northern California (McCaskie *et al.* 1988). Numbers have declined over most of the range in recent decades because of destruction and fragmentation of grassland and wetland habitats, and grazing (Remsen 1978).

Feeding: Feeds primarily on voles and other small mammals (Bent 1938, Earhart and Johnson 1970). Birds are an important food source in coastal wintering areas, and in nesting season. Also eats reptiles, amphibians, and arthropods. Frequently searches in low, gliding flight 1-6 m (3.3 to 20 ft) above the ground; swoops and pounces; also hunts from a perch. Commonly found in treeless areas using fence posts and small mounds as perches.

Cover: Requires dense vegetation; tall grasses, brush, ditches, and wetlands are used for resting and roosting cover (Grinnell and Miller 1944).

Reproduction: Nests on dry ground in a depression concealed in vegetation, and lined with grasses, forbs, sticks, and feathers; occasionally nests in a burrow.

Water: Has been observed drinking in the wild (Dixon and Bond 1937) and in captivity (Clark 1975), but not known if water is essential.

Pattern: Found in open, treeless areas with elevated sites for perches, and dense vegetation for roosting and nesting.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, circadian activity; mostly crepuscular, at night, and on cloudy days.

Seasonal Movements/Migration: Migrants usually arrive in California in September or October, and leave in April. Concentrates in winter in areas where prey is abundant, and snow cover is scant or absent (Bent 1938).

Home Range: Pitelka *et al.* (1955a) estimated that density on tundra in Alaska varied from 1.2 to 1.5 pair per km² (3-4 per mi²).

Territory: On prairie marshland in Manitoba, breeding territory in 1969 averaged 0.7 km² (0.3 mi²), and varied from 0.2 to 1.0 km² (0.1 to 0.4 mi²) (n = 5) (Clark 1975). In Alaska, Pitelka *et al.* (1955b) reported minimum breeding territory of about 20 ha (50 ac). Territory may vary greatly in response to small mammal density (Clark 1975).

Reproduction: Courtship consists of aerial displays and hooting (Pitelka *et al.* 1955a). Breeds from early March through July (Bent 1938). Clutch size 4-14 eggs, usually 5-7, and higher in years with high prey population. Eggs laid in April and May; incubated by female for 21-28 days. Male brings food to female, which feeds and cares for semialtricial young. Fledging is at 31-36 days (Urner 1923).

Niche: Predators include great horned owls (Hunt 1918, Killpack 1951), golden eagles (McGahan 1968), snowy owls (Murie 1929), and peregrine falcons (Sooter 1942). Small, predatory mammals and large reptiles may prey upon young and eggs. Competitors include northern harriers (Berger 1958), gulls (Fisler 1960), barn owls, and other large owls.

Comments: A California Species of Special Concern (Remsen 1978).

REFERENCES

Hunt 1918, Urner 1923, Murie 1929, Townsend 1937, Dixon and Bond 1937, Bent 1938, Sooter 1942, Grinnell and Miller 1944, Killpack 1951, Pitelka *et al.* 1955a, 1955b, Johnston 1956, Berger 1958, Fisler 1960, Guiguet 1960, McGahan 1968, Earhart and Johnson 1970, Karalus and Eckert 1974, Clark 1975, Murray 1976, Udvardy 1977, Remsen 1978, Bertrand and Scott 1979, Garrett and Dunn 1981, Ehrlich *et al.* 1988, McCaskie *et al.* 1988.

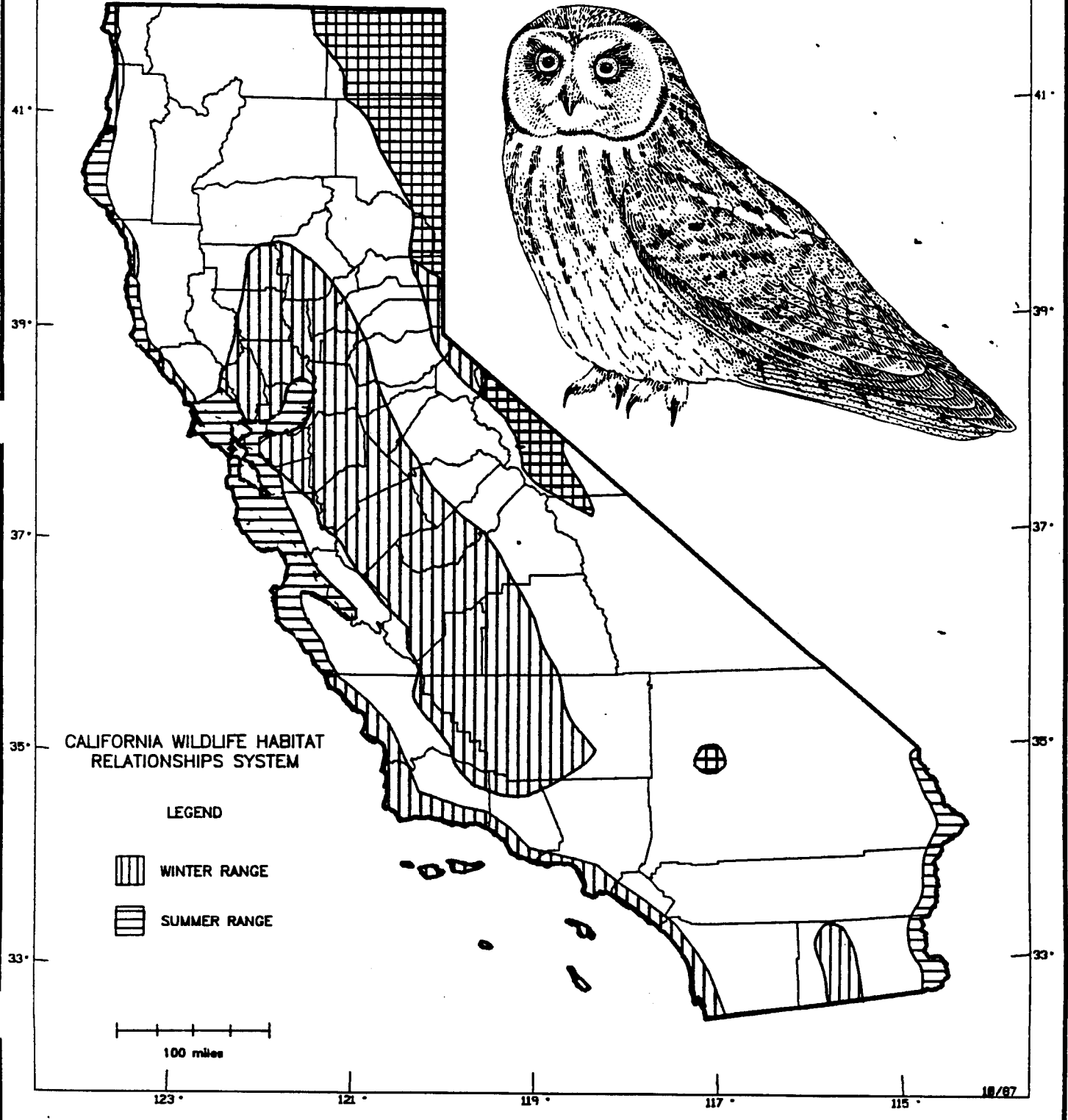
SHORT-EARED OWL

AUTHORSHIP

Species Note Prepared By: C. Polite

Species Note Edited By: L. Kiff

Species Note Reviewed By: L. Kiff



B279 Black Swift *Cypseloides niger*

Family: Apodidae Order: Apodiformes Class: Aves

Management Status: California Species of Special Concern Date: October 16, 1984

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mts., and in coastal bluffs and mountains from San Mateo Co. south probably to San Luis Obispo Co. Nests in moist crevice or cave on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons. Forages widely over many habitats. In migration, rare and irregular outside the breeding range; does not winter in the state (Grinnell and Miller 1944, Remsen 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds exclusively on flying insects, captured in sustained, long-distance foraging flights, usually high in the air. Often pursues insects in updrafts associated with cliffs or storm fronts.

Cover: Apparently the only regular resting places are on steep, rocky, often moist, cliffs such as those used for resting (Bent 1940).

Reproduction: Builds nest in moist location on sea cliff above surf, or on cliff behind, or adjacent to, waterfall in deep canyon. Nest constructed of mud mixed with moss, ferns, seaweed, or other plant materials; located in deep, dark crevice, in cave, or under overhang (Bent 1940). Nests in colony of a few pairs. Nest usually kept moist by mist from the surf or waterfall.

Water: Required at nest, as described above, and possibly at roost, but it is not known whether drinking water is required.

Pattern: If there are suitable nest sites for breeding, will forage over almost any terrain and habitat. Seems to avoid arid regions, however, such as the Great Basin, southern deserts, and Central Valley.

SPECIES LIFE HISTORY

Activity Patterns: Diurnal activity, including in migration. Other swifts undergo periods of torpor in cold weather, when flying insects are scarce (Terres 1980), and black swift may do the same.

Seasonal Movements/Migration: Migrates south for the winter; mostly absent from October through April. Noted rarely and irregularly outside the breeding range, mostly west of the Great Basin and southern deserts.

Home Range: Home range very large (Bent 1940, Grinnell and Miller 1944), but has not been measured.

Territory: Territoriality has not been reported for this species; territory presumably limited to nest site.

Reproduction: Breeding season lasts from early June to late August. Usually nests in small colony. Lays only 1 large egg per yr (Harrison 1978). Incubation lasts 24-27 days. Altricial young leave the nest at about 45 days (Hunter and Baldwin 1962), but nestling period probably highly variable as in other swifts. Young can go without food for long periods (Terres 1980).

Niche: Nests are inaccessible to terrestrial predators and human disturbance, with the exception of rock-climbers, who rarely use these wet cliffs.

Comments: A California Species of Special Concern (Remsen 1978).

REFERENCES

Michael 1927, Bent 1940, Grinnell and Miller 1944, Udvardy 1954, Lack 1956, Knorr 1961, Hunter and Baldwin 1962, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, 1988, Terres 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

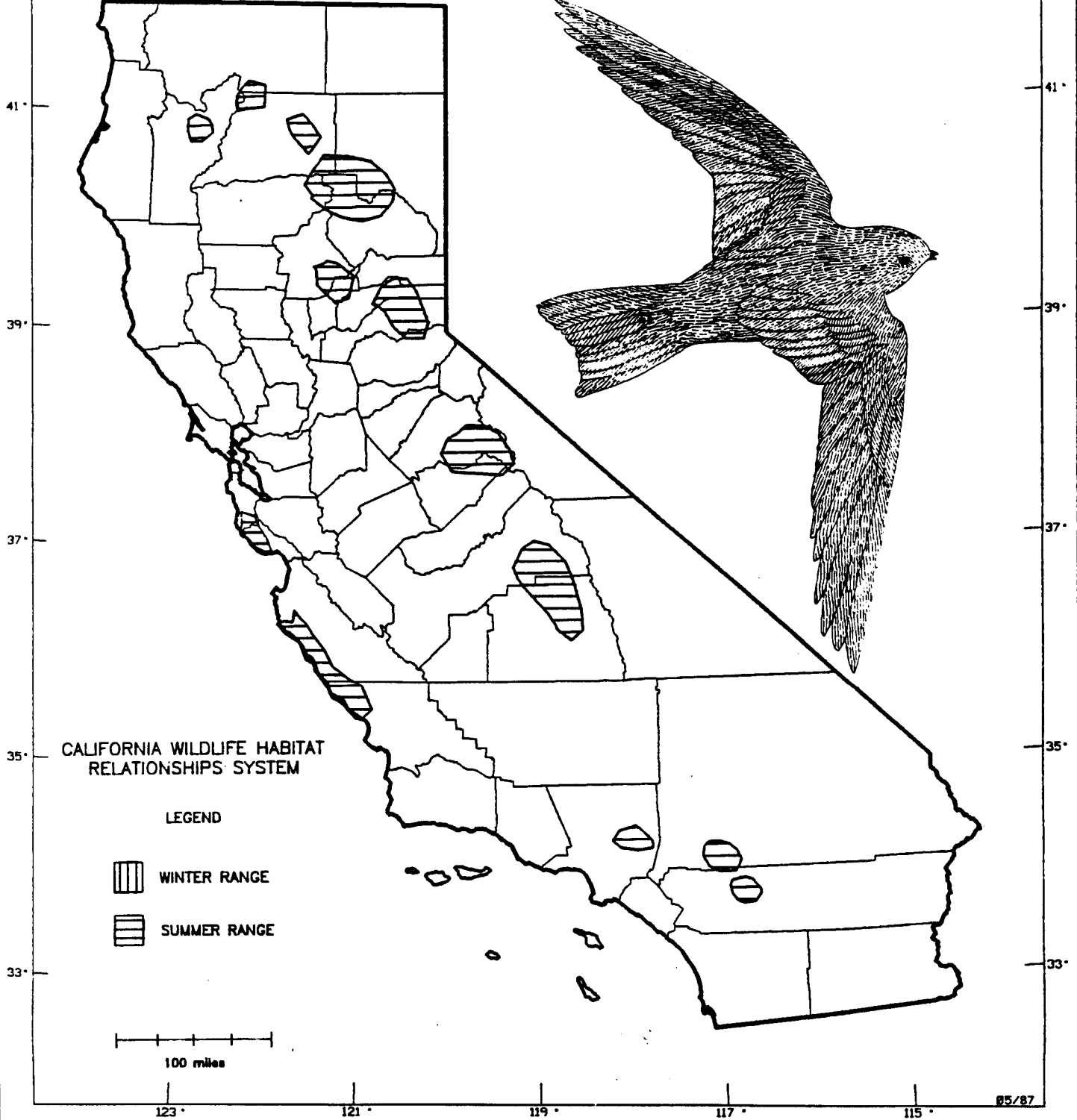
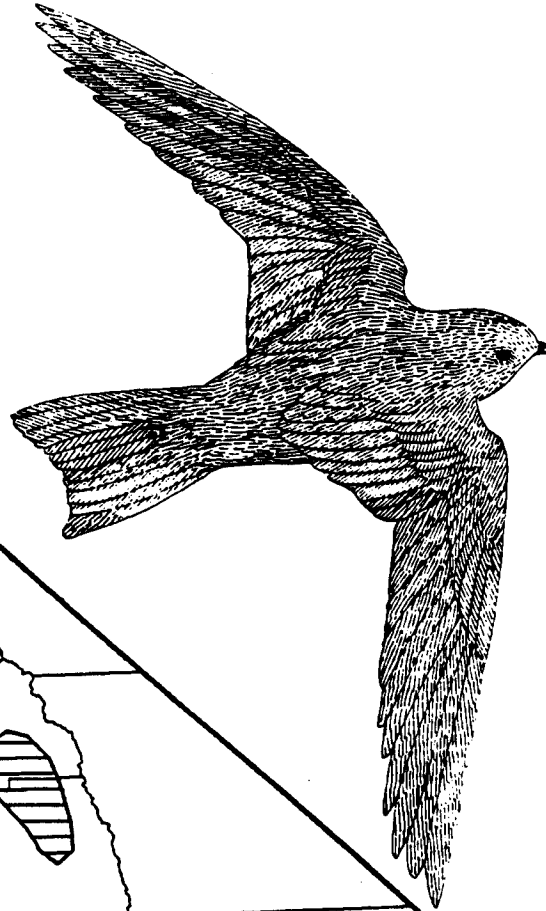
BLACK SWIFT

AUTHORSHIP

Species Note Prepared By: S. L. Granholm

Species Note Edited By: R. Duke

Species Note Reviewed By: L. R. Mewaldt



B065 Fulvous Whistling-Duck *Dendrocygna bicolor*

Family: Anatidae **Order:** Anseriformes **Class:** Aves **Date:** June 28, 1983
Management Status: California Species of Special Concern, Harvest Species

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The fulvous whistling-duck nests irregularly in California in the Imperial Valley in dense wetlands of cattails along the south end of the Salton Sea (Remsen 1978). It is found in fresh emergent wetlands, shallow lacustrine and quiet riverine waters; it also feeds in wet croplands and pastures. Fairly common (but declining) in the Imperial Valley March to August and sporadic through winter (Garrett and Dunn 1981). Elsewhere in California, it is rare and irregular (McCaskie *et al.* 1979, Garrett and Dunn 1981), with most records from the Colorado River area and San Joaquin Valley. According to Cogswell (1977) it is uncommon to fairly common (some years only) in the San Joaquin Valley, April to November.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds mostly nocturnally but also diurnally on rice, other grains, seeds, and green shoots of herbs. About 3% of diet is insects (Palmer 1976). Searches for food by walking over wet fields or in shallow water; swims in shallow water and takes food from surface, well as by tipping; often makes shallow dives (Palmer 1976).

Cover: In California, usually rests by day in dense emergent wetland, and rarely perches in trees or uses wooded habitats (Cogswell 1977).

Reproduction: In California, nests in dense emergent wetland of cattails near the south end of the Salton Sea (Garrett and Dunn 1981), usually on high ground (Cogswell 1977). Formerly nested in dense emergent wetland of tules, and less commonly in rice fields, in the San Joaquin Valley (Palmer 1976).

Water: No additional data found.

Pattern: Prefers to nest and roost in dense emergent wetland near good feeding areas in shallow water or wet fields.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, circadian feeder, but principally active nocturnally.

Seasonal Movements/Migration: Apparently migrates in California. Most of breeding population leaves September to February, and migrates to wintering areas in Mexico.

Home Range: No information found.

Territory: No information found.

Reproduction: Nests April to September in southern California (Cogswell 1977). Information below, mostly from Harrison (1978), pertains to other parts of North America. Monogamous, solitary nester, but often nests in high densities. Clutch size 8-16, but often several females lay in same nest, resulting in many more eggs. Single-brooded. Incubation 28 days. Precocial young are tended by both parents. A young bird reared by Meanley and Meanley (1959) first flew at 63 days. First breeds at 1 yr.

Niche: Nests often destroyed by farmers in other parts of North America. Nest predators include skunks, raccoons, opossums, and dogs. Susceptible to poisoning by pesticides used on crops. Susceptible to killing by hunters because of unwary behavior (Johnsgard 1975b).

Comments: Formerly nested along southern coast, in San Francisco Bay, and in San Joaquin Valley. Decline in California probably resulted from destruction of wetland habitat; a California Species of Special Concern (Remsen 1978).

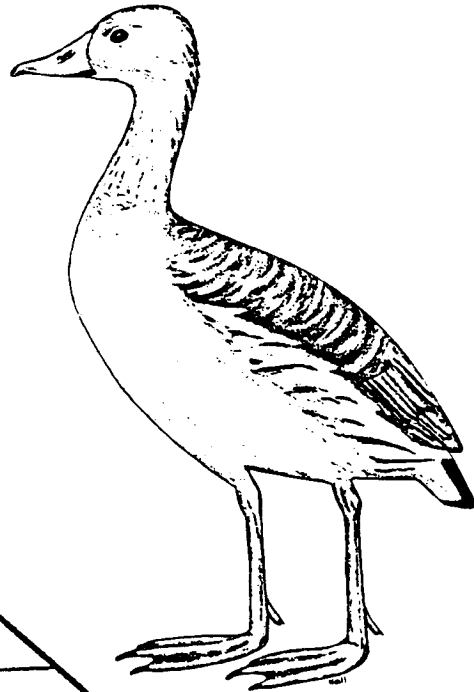
REFERENCES

Meanley and Meanley 1959, Johnsgard 1975b, Bellrose 1976, Palmer 1976, Cogswell 1977, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981.

FULVOUS WHISTLING-DUCK

AUTHORSHIP

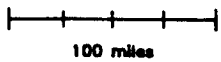
Species Note Prepared By: S. L. Granholm
Species Note Edited By: R. Duke
Species Note Reviewed By: D. G. Raveling



CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE



123°

121°

119°

117°

115°

07/87

B076 Wood Duck *Aix sponsa*

Family: Anatidae Order: Anseriformes Class: Aves

Management Status: Harvest Species Date: June 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon yearlong resident, occurring mainly in Central Valley, and in Coast Ranges of central California. More widespread and common in winter, occasionally moving south (Brown *et al.* 1979). Inhabits lacustrine and slow-moving riverine habitats bordered by trees or other tall vegetation, and preferably by emergent vegetation as well. Prefers aquatic habitats bordered by deciduous trees such as willows, cottonwoods, and oaks (Grinnell and Miller 1944). Fall concentrations highest in Butte Sink, and in lakes bordered by oak woodlands (Cogswell 1977). Reservoirs less suitable, especially in nesting season (Naylor 1960). Formerly more common, now an uncommon breeder in California, April to August, mainly in inner Coast Ranges near, and north of, San Francisco Bay, but also locally throughout northern and central California, excluding northeastern plateau, but including eastern Cascades and Sierra Nevada south to Lake Tahoe. Very few breeding records in southern California. From September to April, uncommon to rare (locally common) in central Coast Ranges south to Alameda and Santa Clara cos., fewer in interior lowlands of central and northern California, and rare in southern California, where mainly found in coastal counties (Cogswell 1977, McCaskie *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Primarily herbivorous, feeding on seeds, stems, and leaves of aquatic plants, seeds of trees and shrubs, waste grains, grasses, forbs, and berries. Landers *et al.* (1977) found breeding females ate large amounts of invertebrates. In Missouri, invertebrates made up 79% of diet of females during laying, 54% before laying, and 43% after laying; and composed about 1/3 of diet of males, spring through autumn (Drobney and Fredrickson 1979). Acorns particularly favored and sought, preferably, in flooded woodlands, but also on ground, if undergrowth is lacking (Bellrose 1976), and directly from trees (Johnsgard 1975b). Takes food from water surface and subsurface, but does not tip-up frequently; also forages ashore, usually in wooded habitats, but sometimes in agricultural fields. Best foraging habitat is in water less than 46 cm (18 in) deep (McGilvrey 1968). Young feed largely on insects during early weeks, and on vegetation thereafter (Hocutt and Dimmick 1971).

Cover: When not breeding, roosts on quiet waters, sheltered by trees, shrubs, or tall emergent vegetation; swamps, ponds, coves of lakes, flooded woodlands, and open water. Often roosts in large flocks. In midday, rests ashore, or in water.

Reproduction: Nests in cavities in trees, pileated woodpecker nest-cavities, or old, rotted flicker cavities (Palmer 1976). Suitable nest boxes and other artificial structures accepted readily (Bellrose *et al.* 1964, Bellrose 1976, Griffith and Fendley 1981). Nests preferably near, or over, water, but may be up to 350 m (1150 ft) away (Gilmer *et al.* 1978). Cavities may be 0.6-20 m (2-65 ft) above ground, but those over 9 m (30 ft) preferred (Bellrose 1976). Most suitable cavities in trees with dbh 61-91 cm (24-36 in), but some in trees as small as 41 cm (16 in) dbh (Bellrose *et al.* 1964, McGilvrey 1968). Ideal habitat for brood-rearing and summer molt is quiet water providing overhanging wooded vegetation, or dense emergent vegetation; small passages of open water; submerged vegetation (providing invertebrate food); and perches (Palmer 1976).

Pattern: For nesting, requires trees bordering a quiet aquatic habitat with emergent vegetation. In nonbreeding season, aquatic habitat may be bordered by any tall vegetation, but trees preferred.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity; feeds mostly early and late in day.

Seasonal Movements/Migration: Nonmigratory over most of California range, but breeding populations east of Sierra Nevada and Cascades absent in fall and winter, and sparse wintering population of southern California mostly is absent April to August. Some shift from higher to lower elevations in winter (Naylor 1960).

Home Range: Summer home ranges of flightless broods in Ohio were 0-5.6 km (0-3.5 mi) along a river, and 0-12.8 km (0-8 mi) for fledged broods (Stewart 1958). Home ranges of breeding males in Minnesota averaged 202 ha (500 ac), and those of unpaired males, 526 ha (1300 ac) (Gilmer 1971). In Minnesota, breeding females remained within 1 km (0.6 mi) of the nest during 70% of their time away (Gilmer *et al.* 1978).

Territory: Does not defend a breeding territory, but male defends mate from other males (Palmer 1976).

Reproduction: In California, breeds from April to August (Cogswell 1977). At least temporarily monogamous, but same male may not fertilize all of a given female's clutches in a season. Solitary nester, but lack of territoriality may permit high nest densities, especially in nest boxes. Clutch usually 9-14; larger sets frequently result from communal laying by several females. Communal nesting may be by females of all ages, and by females that additionally raise own brood. Usually single-brooded, but occasionally double-brooded. Most reported incubation periods from 27-35 days. Precocial young tended by female alone, and first fly at 8-9 wk, but may become independent at 5-6 wk. A few breed at 1 yr, but most unsuccessful until following season.

Niche: Competitors for nest cavities include starlings, squirrels, bees, hornets, screech-owls, and kestrels (McGilvrey 1968). Raccoons are important predators on eggs and setting females, and fox squirrels, minks, opossums, and rats eat many eggs. Predators on ducklings include minks, fish, snakes, bullfrogs (McGilvrey 1968). Nest boxes have allowed populations to increase in many areas, and they provide better protection from weather and predators than many natural cavities (Palmer 1976). Grabill (1977) and Heusmann *et al.* (1977) discussed methods to reduce starling use of nestboxes. The decline of nesting in California probably results from destruction and disturbance of riparian woodlands, and predation by humans and domestic animals on young (Cogswell 1977). Adults are killed by hunters.

REFERENCES

Grinnell and Miller 1944, Stewart 1958, Naylor 1960, Bellrose *et al.* 1964, McGilvrey 1968, Gilmer 1971, Hocutt and Dimmick 1971, Johnsgard 1975b, Palmer 1976, Bellrose 1976, Cogswell 1977, Grabill 1977, Heusmann *et al.* 1977, Landers *et al.* 1977, Gilmer *et al.* 1978, Brown *et al.* 1979, Drobney and Fredrickson 1979, McCaskie *et al.* 1979, Longwood 1980, Garrett and Dunn 1981, Griffith and Fendley 1981.

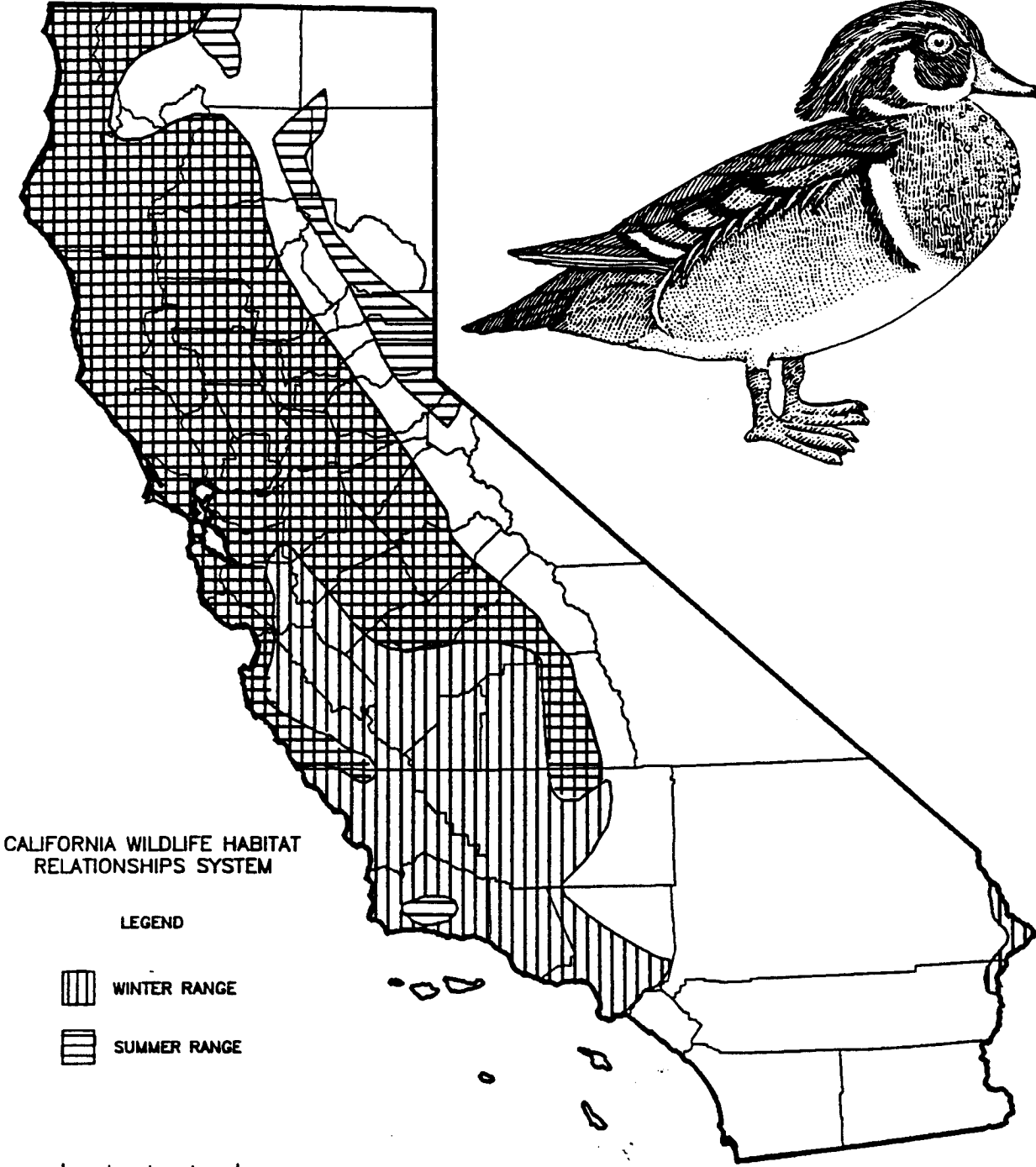
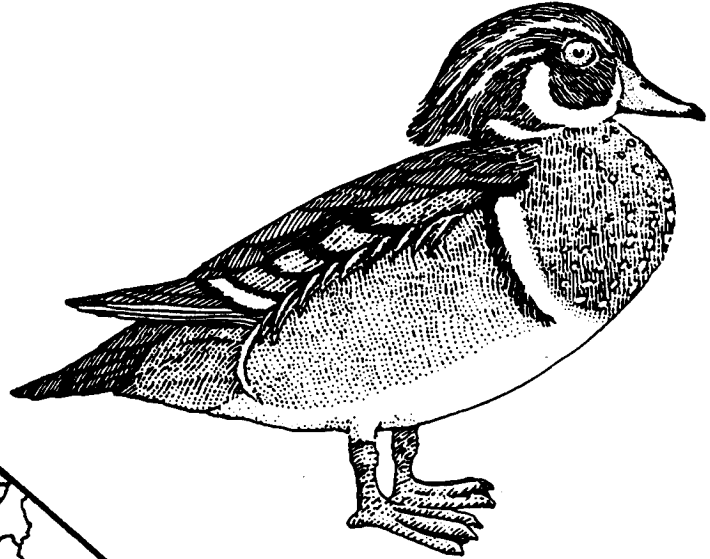
WOOD DUCK

AUTHORSHIP

Species Note Prepared By: S. L. Granholm

Species Note Edited By: R. Duke

Species Note Reviewed By: D. G. Raveling



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

03/87

B089 Canvasback *Aythya valisineria*

Family: Anatidae Order: Anseriformes Class: Aves
Management Status: Harvest Species Date: July 1, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The canvasback is found in estuarine and lacustrine habitats throughout much of California. Abundant November to March, and less common September to October and April to May on bays along northern and central California coast, especially San Francisco Bay. In these seasons, common on Salton Sea and in the Central Valley, less common elsewhere in lowlands and southern California, and rare on northern mountain lakes. In northeastern California, abundant October to November and March to April (and through mild winters), and rare, or local, through summer. Breeds in fresh, emergent wetlands bordering open water. Elsewhere in California, irregular in summer, mainly along coast and on Salton Sea (Cogswell 1977, U.S. Fish and Wildlife Service 1978, 1979, McCaskie *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats seeds, tubers, leaves, and stems of aquatic plants (mainly submergents), aquatic mollusks, crustaceans, worms, insects, and fish. Invertebrates are the principal foods in winter (Grinnell *et al.* 1918, Cogswell 1977), and of adult females and young in summer (Bartonek and Hickey 1969a, 1969b). Most studies of wintering elsewhere, both in fresh and saline water, found that plant foods predominated in the diet (Palmer 1976). Dives for food, usually in water 0.9-3.6 m (3-12 ft) deep (Palmer 1976), and grubs in bottom sediments, or pursues fish. Also tips up, in shallower water, and takes food from surface. Prefers extensive areas of shallow water for foraging.

Cover: Usually rests on water far from shore, but stays near protected shorelines during high winds.

Reproduction: Nests in California only in small numbers. The nest is a mound of aquatic vegetation amidst emergent plants, over shallow water, and near open water. The body of water may be a small pond, slough, or large emergent wetland or lake. Sometimes nests are stranded on dry land when water recedes.

Water: No additional data found.

Pattern: For nesting, requires emergent vegetation near suitable shallow-water foraging areas.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Typically feeds early and late in day, and rests during midday and at night. In tidal areas, feeds most actively in shallow water just after tideflats flood (Cogswell 1977).

Seasonal Movements/Migration: Except for a small breeding population in northeastern California, the wintering population migrates to breeding grounds in the northern continental U.S., Canada, and Alaska, and mostly is absent June to August.

Home Range: Breeding home ranges of 2 drakes in Manitoba were 525 ha (1300 ac) and 1035 ha (2560 ac) (Dzubin 1955).

Territory: Apparently no territory is defended. At times, the drake defends an area of about 5 m (16 ft) around his mate, but at other times he ignores other males (Hochbaum 1944, Dzubin 1955).

Reproduction: Some pairing takes place in winter. In California, young reported June to August (Cogswell 1977). Monogamous, solitary nester. Clutch size usually 7-9 (Harrison 1978). Single-brooded. Incubation 23-29 days. Precocial young tended by female only, and probably first fly at 60-70 days, but become independent several wk earlier. Female breeds first as yearling. Male may go unmated because of skewed sex ratio.

Niche: Nest parasitism by redhead is one of the main causes of nest desertion, and also reduces hatching success (Bellrose 1976). Other common causes of desertion are parasitism by other canvasbacks, and flooding (Bellrose 1976). Important nest predators include raccoons, skunks, ravens, crows and magpies. Numbers have declined from drainage of breeding wetlands, and perhaps from overshooting of females and young (Palmer 1976).

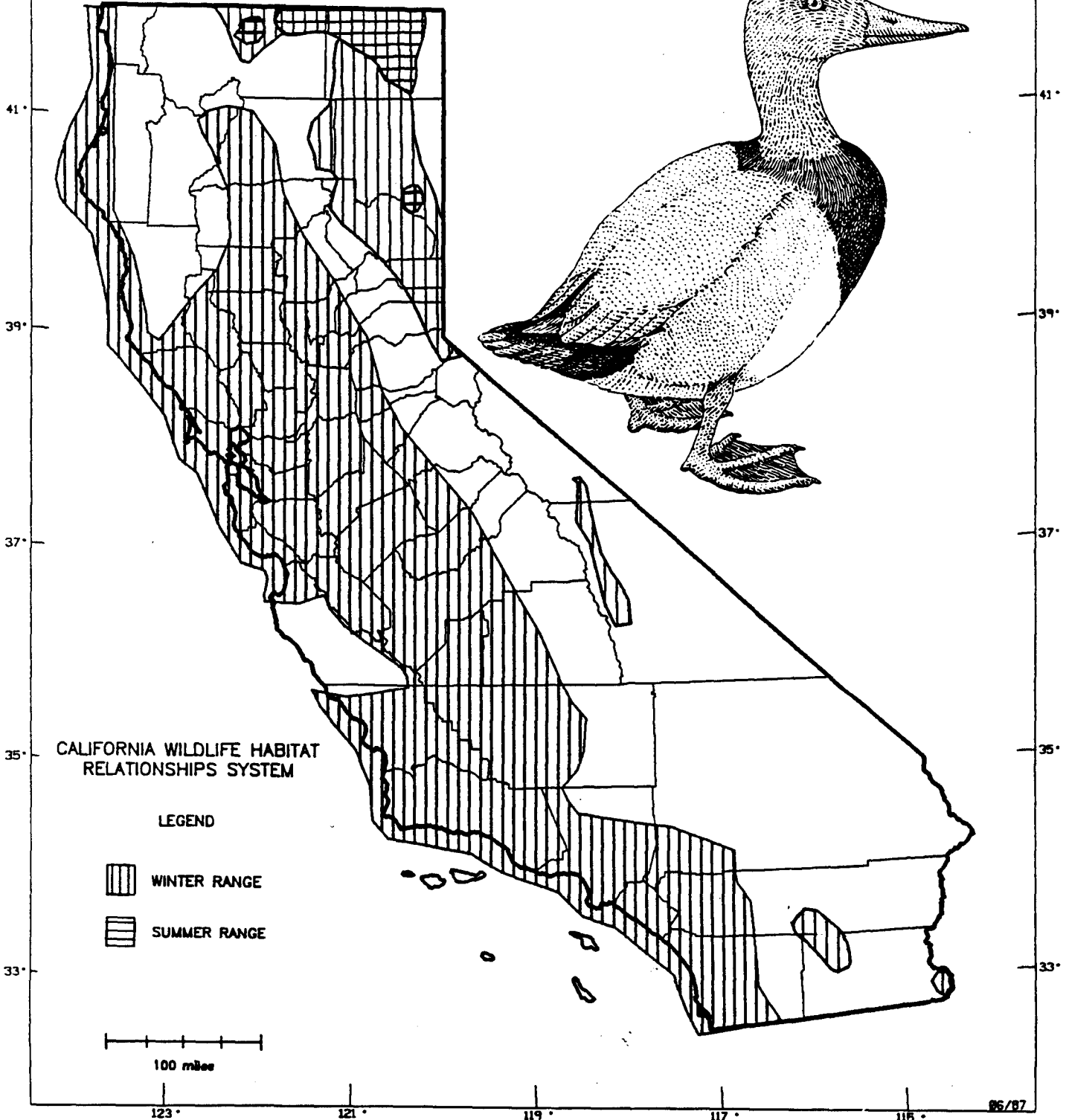
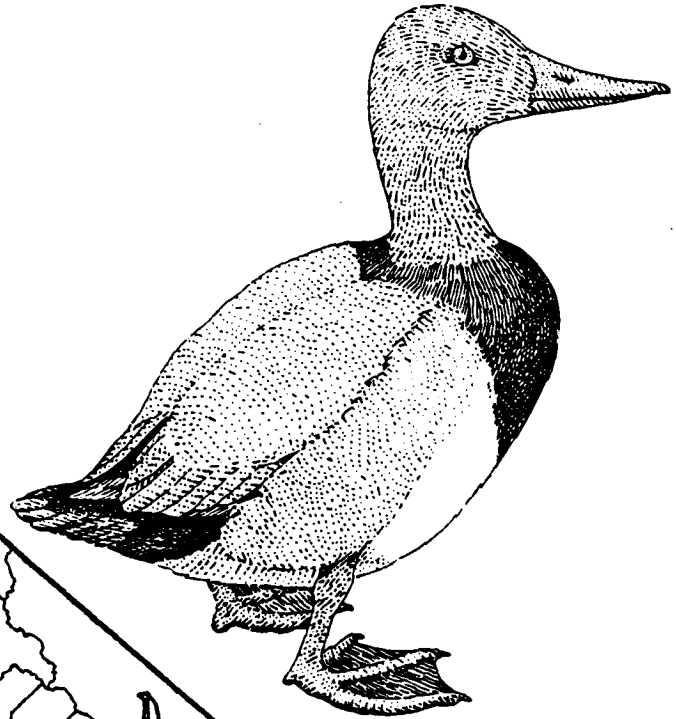
REFERENCES

Grinnell *et al.* 1918, Hochbaum 1944, Dzubin 1955, Bartonek and Hickey 1969a, 1969b, Johnsgard 1975b, Bellrose 1976, Palmer 1976, Cogswell 1977, Harrison 1978, U.S. Fish and Wildlife Service 1978, 1979, McCaskie *et al.* 1979, Garrett and Dunn 1981.

CANVASBACK

AUTHORSHIP

Species Note Prepared By: S. L. Granholm
Species Note Edited By: R. Duke
Species Note Reviewed By: D. G. Raveling



B145 Virginia Rail *Rallus limicola*

Family: Rallidae Order: Gruiformes Class: Aves Date: April 23, 1984

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A fairly common resident in California. In summer, breeds in fresh emergent wetlands and wet meadows the length of the state. Concentrated in the Great Basin from Inyo Co. north to the Oregon border, the Central Valley, and the San Francisco Bay area. Also nests sparingly north near the coast to Mendocino and Humboldt cos., and in south coastal areas from San Luis Obispo Co. to the Mexican border, as well as in the Imperial and Colorado River valleys. In winter, migrates from the northeastern plateau to lowland portions of the range. Occurs in saline emergent wetlands in the nonbreeding season, but apparently not while breeding (McCaskie *et al.* 1979, Garrett and Dunn 1981). Destruction of marshes has reduced numbers in coastal southern California (Garrett and Dunn 1981), and elsewhere (Grinnell and Miller 1944). Vagrant individuals observed on South Farallon Island in September, 1968, and 1971 (DeSante and Ainley 1980), and there are 5 fall/winter records from the Channel Islands (Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds in tall, emergent vegetation by probing in mud and wading in shallow water. Searches the ground and plant stems for adult insects and larvae, slugs, snails, crustaceans, and worms (Terres 1980). In autumn, eats seeds of marsh plants (Cogswell 1977). Occasionally forages under, or well into, riparian shrubs, along marsh borders, or even swims into open water to snatch small fish. Rarely, feeds in dry, weedy fields. In Iowa marshes, 62% of the food was insects (Horak 1970).

Cover: Requires emergent vegetation at least 0.6 m (2 ft) tall for escape cover.

Reproduction: Breeds in cattails, bulrushes, and other emergent vegetation in freshwater marshes. Areas may be quite small, but must have some open water and tall, emergent vegetation to support a nesting pair (Grinnell and Miller 1944). Nests on the ground, hidden by vegetation, suspended between stems above water, or perched on grass tussocks (Harrison 1978).

Water: No additional data found.

Pattern: Occurs at all seasons in freshwater habitats with tall, emergent vegetation. In winter, also frequents saline emergent wetlands where it can be observed best during high tides (Cogswell 1977).

SPECIES LIFE HISTORY

Activity Patterns: Active yearlong. Activity difficult to observe because of secretive behavior and dense cover. As with most rails, it is most easily detected by its distinctive calls, which are given day and night (Terres 1980).

Seasonal Movements/Migration: Permanent resident in lowland, freshwater habitats, but Great Basin breeding population migrates south or west for the winter. Most winter visitors to coastal California leave these areas in summer. Primarily migrates at night by flying low over water or level ground (Bent 1926), but probably higher above rougher terrain.

Home Range: In Michigan, Berger (1951) found 5 nests of this species and 4 nests of the sora, all active simultaneously in a 0.2 ha (0.5 ac) marsh bordering a wooded swamp. Two of the Virginia rail nests were 11 m (33 ft) apart.

Territory: Both Walkinshaw (1937) and Kaufman (1971) reported territorial behavior, but did not give extent of defended space. Sketch maps by Glahn (1974) of 18 territories in Colorado suggested sizes ranging from 520-3080 m² (5600-33,150 ft²), with a mean of about 1370 m² (14,750 ft²).

Reproduction: Typically breeds April to June, but young have been noted as late as August (Cogswell 1977). Clutch size 5-12 eggs, and may be double-brooded occasionally. Incubation 14-16 days (Mousley 1937), but up to 19 days (Cogswell 1977), and both sexes incubate. Precocial young fed by parents even after fledging (Harrison 1978).

Niche: Heavy grazing of wetlands and wet meadows can be very detrimental.

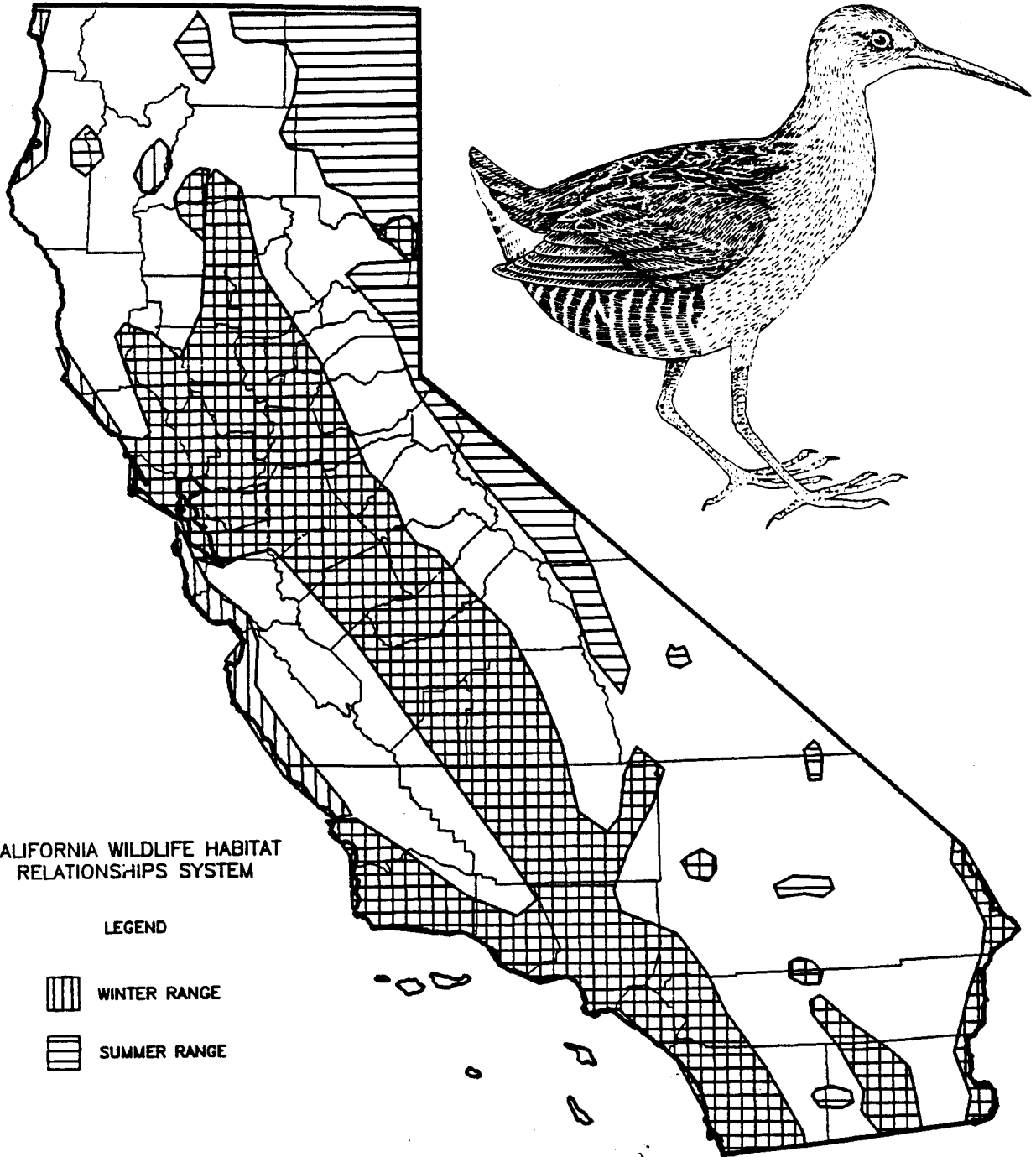
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VIRGINIA RAIL

AUTHORSHIP

Species Note Prepared By: E. C. Beedy
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Species Note Reviewed By: H. L. Cogswell



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

6/6/87

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

In summer, fairly common and widespread in fresh emergent wetlands of northern California. It breeds throughout the San Francisco Bay area, north into Sonoma and Napa cos., throughout the Central Valley, and east of the Cascade-Sierra Nevada crest south at least to Mono Lake (Grinnell and Miller 1944). It probably breeds regularly in southern California mountains, but the only recent breeding record is from Fain Springs in the San Bernardino Mts. Historical nesting localities include Big Bear Lake in the San Bernardino Mts. and the Owens Valley, Inyo Co. There are a few summer records from the Salton Sea district and along the coastal lowlands, but recent nesting there has not been confirmed (Garrett and Dunn 1981). In winter, northern and high-elevation populations migrate southward. Widespread along the southern California coast in winter, as well as at the Salton Sea and the Colorado River, and visitors occasionally reach the Channel Islands (Garrett and Dunn 1981). There are historical, northern coast wintering records (Grinnell and Miller 1944). Although absent from the immediate coast in summer (McCaskie *et al.* 1979), visits saline emergent wetlands in the nonbreeding season. Most common rail in California and North America, but numbers have been reduced by loss of wetlands.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Primarily forages on the ground in dense, emergent vegetation, but less commonly walks on mudflats in marsh openings, wades into water, or swims. In Iowa, Horak (1970) reported a diet of 73% seeds (by weight), largely of *Polygonum*, sedges, foxtail grasses, and duckweed. During spring and summer, also eats many small mollusks and aquatic insects (Terres 1980).

Cover: Emergent vegetation such as grasses, sedges, cattails, or rushes needed for cover.

Reproduction: Nests in cattails, grasses, sedges, and rushes in emergent wetlands (small or large), where water is shallow and food is abundant (Johnsgard 1975). Nest usually constructed a few inches above the water and secured to surrounding grasses or reeds. Frequently there is a runway of grasses along the last meter to the nest (Eckert and Karalus 1981). Some nests are built on raised tussocks by the water's edge (Harrison 1978). Nest usually sheltered from above by overhanging vegetation.

Water: No additional data found.

Pattern: Preferred habitats include fresh emergent wetlands, wet meadows, and vegetated margins of sloughs (Grinnell and Miller 1944). In fall, winter, and early spring, is rail also occurs in saline emergent wetlands.

SPECIES LIFE HISTORY

Activity Patterns: Active yearlong. Secretive habits; is heard much more often than seen. It calls most often at night, but also in daylight. Activity pattern and life history poorly known. Primarily migrates at night (Cogswell 1977).

Seasonal Movements/Migration: Some individuals migrate up to 4800 km (3000 mi), each way, between breeding and wintering grounds— one of the longest migrations in the family (Bent 1926). Mostly resident yearlong in central California, but migrates from east of Cascade-Sierra Nevada crest in winter. A winter visitor to southern California, but migrates in summer, except for a few that may breed in southern mountains.

Home Range: Hay (1977) reported 2 territories in a 9.3 ha (23 ac) plot along the Santa Ana River in Riverside Co., which was half marsh and half riparian. Sometimes found close together in non-breeding seasons; e.g., 43 were counted 50-75 m (164-246 ft) apart along a ditch in Colusa Co., March 11, 1955 (Cogswell and Pray 1955).

Territory: Kaufman (1971) described territorial behavior, but gave no sizes. Glahn's (1974) rough sketch map of 6 territories suggested areas of 0.16-0.24 ha (0.4-0.6 ac), with 12 m (39 ft) separating the closest nests. Pospichal and Marshall (1954) found 46 nests averaging 9.4 m (31 ft) apart.

Reproduction: Begins nesting in late April and finishes by mid-August. Monogamous, as other rails (Johnsgard 1975). Single-brooded; clutch size 8-12 eggs (Harrison 1978). Both parents incubate eggs for 14 days, or more (Bent 1926), and help tend young. Young leave nest 1-2 days after hatching, but may return at night. Young fly at about 36 days (Harrison 1978).

Niche: Occurs in many localities with Virginia rail. Berger (1951) recorded the 2 species nesting in proximity on a 0.2 ha (0.5 ac) site in Michigan. Competitive interactions between the 2 species not described; but the more vegetarian diet of the sora (except in breeding period) probably reduces competition. Shallow emergent wetlands are critical. Heavy grazing and wetland reclamation are detrimental.

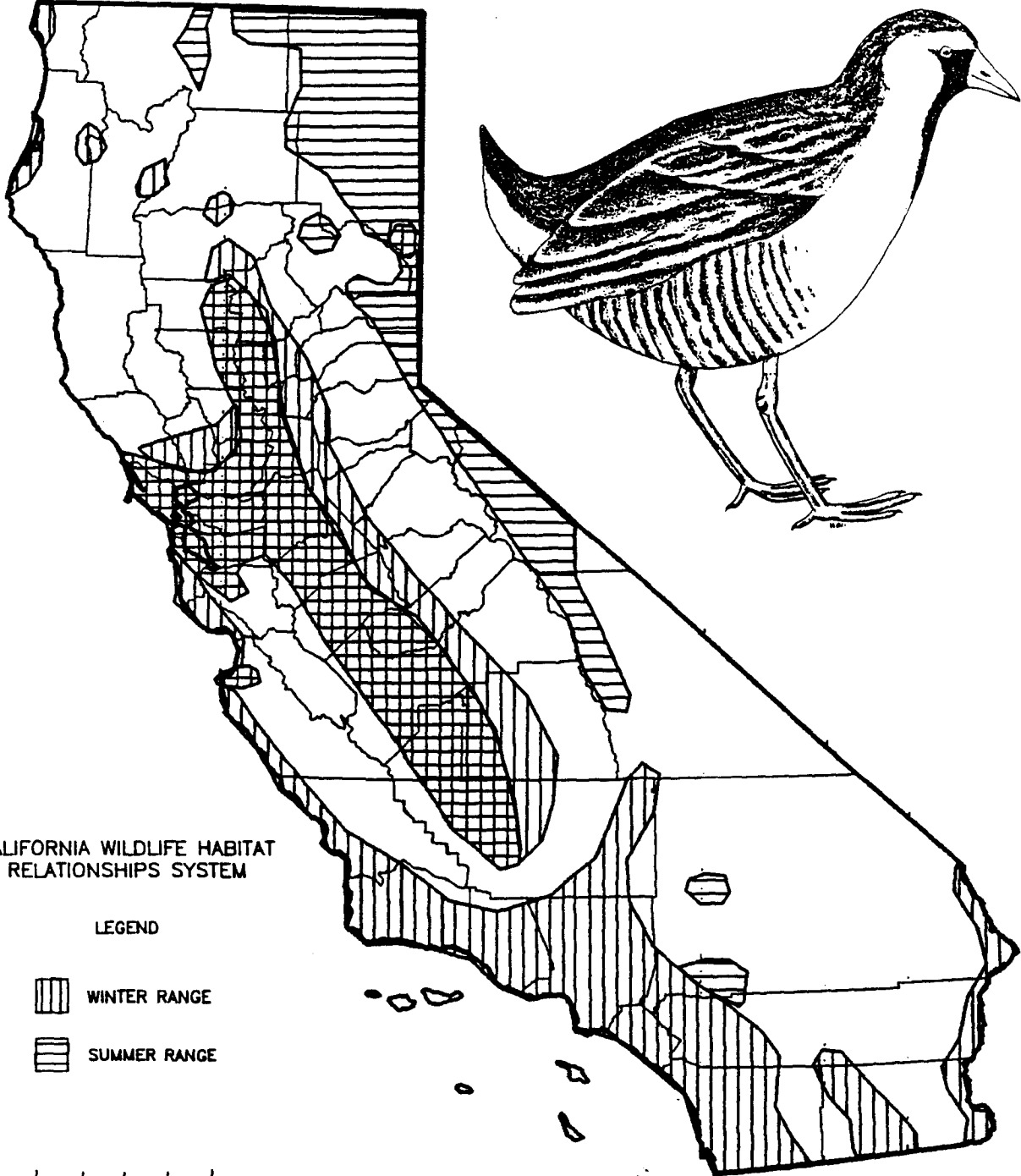
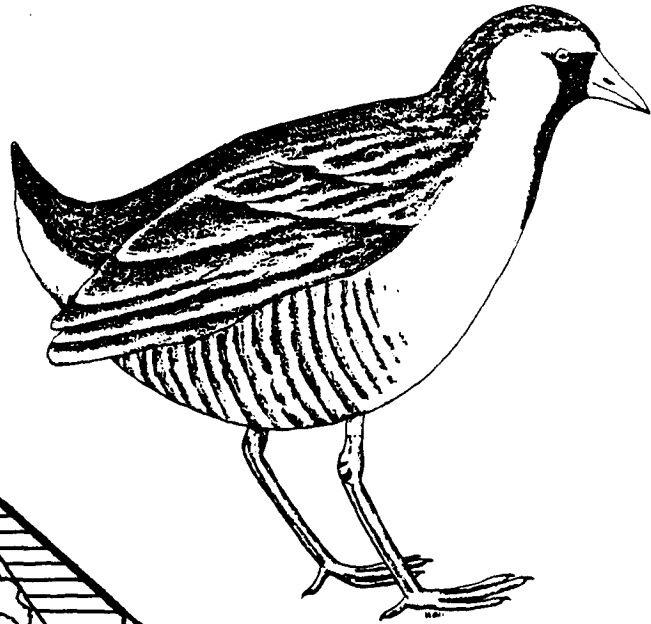
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SORA

AUTHORSHIP

Species Note Prepared By: E. C. Beedy
Species Note Edited By: S. L. Granholm, R. Duke
Species Note Reviewed By: H. L. Cogswell



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B173 Long-billed Curlew *Numenius americanus*

Family: Scolopacidae Order: Charadriiformes Class: Aves

Management Status: California Species of Special Concern Date: April 23, 1984

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon to fairly common breeder from April to September in wet meadow habitat in northeastern California in Siskiyou, Modoc, and Lassen cos. One recent nesting record for Owens Valley, Inyo Co. (McCaskie 1978). Uncommon to locally very common as a winter visitant from early July to early April along most of the California coast, and in the Central and Imperial valleys, where the largest flocks occur. Preferred winter habitats include large coastal estuaries, upland herbaceous areas, and croplands. On estuaries, feeding occurs mostly on intertidal mudflats. Small numbers of nonbreeders remain on coast in summer, and larger numbers remain in some years in the Central Valley (Cogswell 1977, Page *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Uses long bill to probe deep into substrate, or to grab prey from mud surface, while at times wading in belly-deep water. On Bolinas Lagoon, most important prey were mud crabs (*Hemigrapsus oregonensis*), ghost shrimp (*Callinassa californiensis*) and mud shrimp (*Upogebia pugettensis*). Also took insect pupae, gem clams (*Gemma gemma*), and small estuarine fish (Stenzel *et al.* 1976). Inland, takes insects (adults and larvae), worms, spiders, berries, crayfish, snails, and small crustaceans (Bent 1929). Occasionally takes nestling birds (Timken 1969).

Cover: At coastal estuaries, requires high salt marsh, pastures, salt ponds for roosting during high tide periods.

Reproduction: Breeds on grazed, mixed-grass and shortgrass prairies. Habitats on gravelly soils and gently rolling terrain are favored over others (Stewart 1975). Nest usually located in relatively flat areas with grass cover 10-20 cm (4-8 in) high. The nest is a sparsely-lined depression, often remote from water (Palmer 1967). Nest often placed close to cover such as a grass clump, rock, or soil mound (Johnsgard 1981). In California, nests on elevated interior grasslands and wet meadows, usually adjacent to lakes or marshes (Grinnell and Miller 1944).

Water: No additional data found.

Pattern: Upland shortgrass prairies and wet meadows are used for nesting; coastal estuaries, open grasslands, and croplands are used in winter.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Probably feeds at night in estuarine habitats. In winter, makes periodic short flights from intertidal mudflats to high tide roosts, in coordination with the tide cycle.

Seasonal Movements/Migration: Fall migrants begin arriving on central California coast in late June; by mid-April most have left for breeding grounds. Breeders present in northeastern California from April to September. Slightly higher numbers of migrants occur in fall than in the spring migration (Page *et al.* 1979).

Home Range: In eastern Washington, average nesting density was 1 pair/km² (2.5/mi²) (Fitzner 1978). Approximately 40 used Bolinas Lagoon in the nonbreeding season (Page *et al.* 1979). In winter, from 10-14/km² (25-35/mi²) fed on an intertidal mudflat outside of levees at Hayward (Swarth and Cogswell 1981).

Territory: Territory varies with topography and cover, from 20 ha (49 ac) in flat, open habitat to 6-8 ha (15-20 ac) in more diversified habitat (Johnsgard 1981). In Utah, nests were no closer than 460 m (1500 ft) (Forsythe 1970), but in dense populations they may be as close as 250 m (820 ft) (Johnsgard 1981). In favorable habitat, pairs may nest within sight of one another (Palmer 1967). Male defends nest territory.

Reproduction: Breeding season mid-April to September. Generally a solitary nester, but may be loosely colonial in favorable habitats. Mean clutch size 4 eggs; incubation period 27-28 days. Both members of a pair incubate; female mostly during day and male at night. Precocial young cared for by both parents, but female usually leaves when chicks are 2-3 wk old. Fledging period 41-45 days (Johnsgard 1981).

Niche: Currently on Audubon Society's Blue List because of declining numbers, probably caused by agricultural practices (Tate 1981). Proposed as a candidate for Federal Endangered status. Breeding range has retracted considerably in the last 80 yr, but western populations have not decreased as much as those in eastern U.S.

Comments: A California Species of Special Concern.

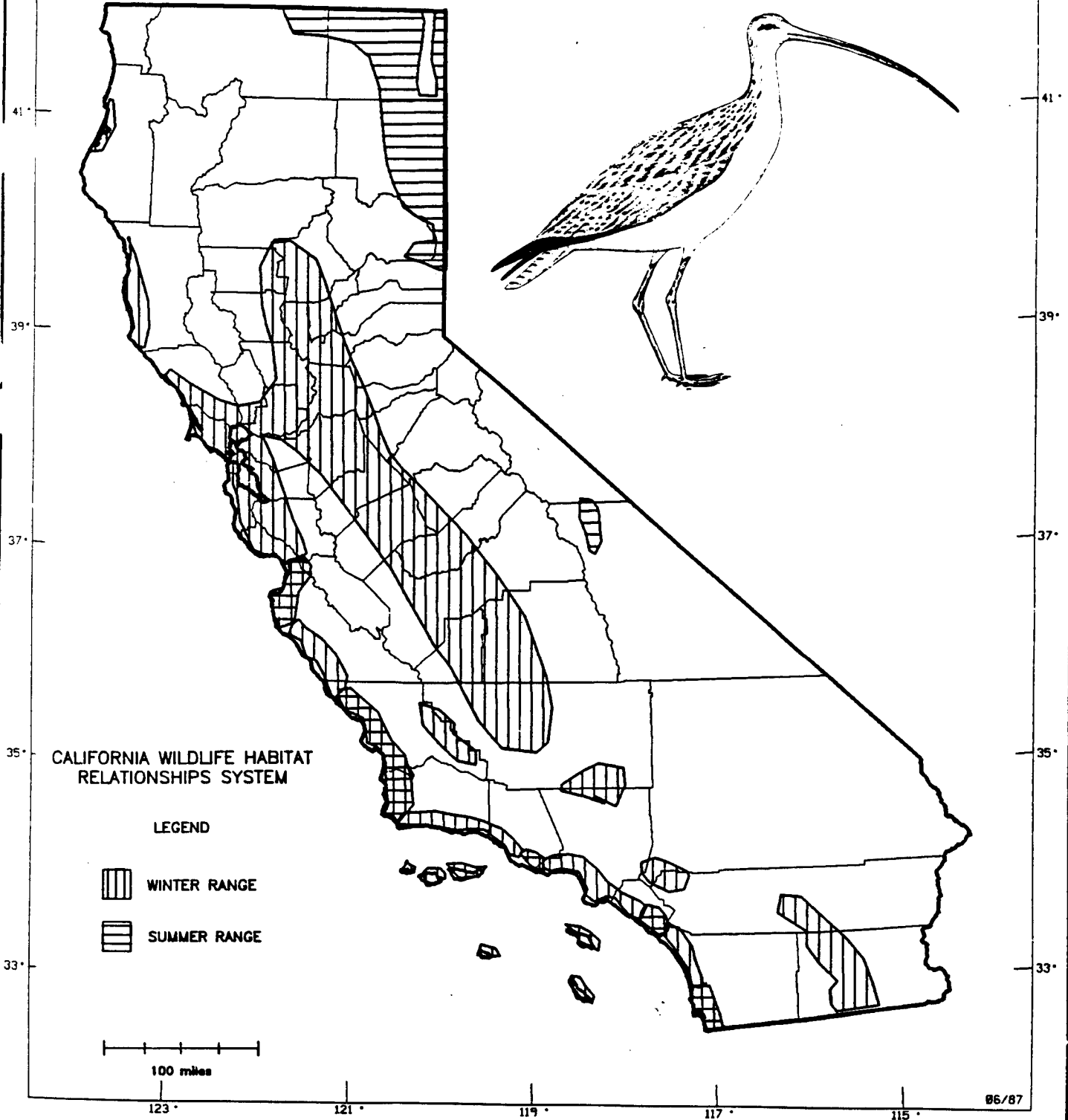
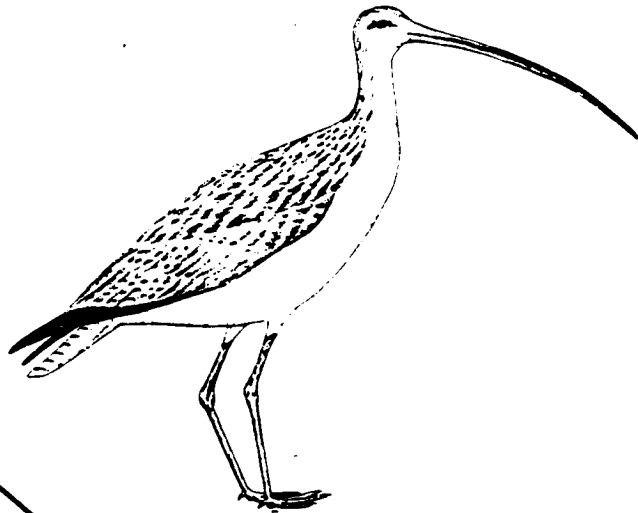
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LONG-BILLED CURLEW

AUTHORSHIP

Species Note Prepared By: C. Swarth
Species Note Edited By: S. L. Granholm, R. Duke
Species Note Reviewed By: H. L. Cogswell



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

86/87

B276 Common Nighthawk *Chordeiles minor*

Family: Caprimulgidae Order: Caprimulgiformes Class: Aves Date: February 22, 1984

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A common summer resident below 2100 m (6900 ft) in mountains and inter-mountain valleys from eastern Siskiyou and Modoc cos. south to Alpine Co., thence east of the Sierra Nevada crest south to Owens and Fish Lake valleys, Inyo Co.; also occurs about coastal cities and towns in Del Norte and Humboldt cos. Locally uncommon to common summer resident in Sierra Nevada foothills from Tehama Co. south to Yuba Co., and along the Sacramento River between Redding and Red Bluff. Rare to occasional summer resident along the coast from Sonoma Co. north (McCaskie *et al.* 1979), in the central and southern Sierra Nevada, and in the San Bernardino Mts. of southern California. Although there is a nesting record in an alpine fell-field at 3300 m (10,750 ft) in the southern Sierra Nevada, this altitude is exceptional (Sumner and Dixon 1953). Transients outside the breeding range are rare (Grinnell and Miller 1944, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Hawks flying insects. An opportunistic feeder, taking those insects that are most abundant and most easily captured (Caccamise 1974). Preferred foraging habitats include broad, open fly-ways over wet meadow, emergent wetland, lacustrine, and riverine habitats and shrub-covered valleys and plains. In addition, often forages at lights, and over most habitats, including forests.

Cover: Territory usually includes a perch for male within 23 m (75 ft) of nest, usually in a tree (Weller 1958).

Reproduction: Does not construct a nest, but lays eggs on bare ground. Preferred nesting habitats include bare, rocky or gravelly ground, burns, and gravel roofs; usually trees in the vicinity.

Water: No data found.

Pattern: Breeders are most numerous where suitable nesting sites, such as barrens, burns, gravel bars, lava flows, dunes, occur near favorable foraging areas, such as meadows, wetlands, lakes and other mesic, insect-rich habitats.

SPECIES LIFE HISTORY

Activity Patterns: Active yearlong; primarily crepuscular, but frequently diurnal or nocturnal as well.

Seasonal Movements/Migration: Arrives in California from wintering areas in South America (?) in late May and June, and departs by September.

Home Range: Little information found, but breeders apparently range many miles from nest site. East of the Sierra Nevada, individuals descend from the mountains for evening foraging in the valleys (Grinnell and Miller 1944). In Kansas, (Fitch 1958) reported a "home range" (territory?) of at least 0.8 km (0.5 m) radius. In Florida, Sutherland (1963) recorded 16 nesting pairs on a 10-ha (25-ac) flat.

Territory: Breeders defend nesting, and frequently feeding, territories. In Michigan, Armstrong (1965) observed 13 aerial feeding territories averaging 10.4 ha (26.5 ac); range 4-23 ha (10-57 ac). Caccamise (1974) found similar-sized territories in New Mexico. If food is locally abundant, e.g., large swarms of flying insects, forages in flocks (Rust 1947).

Reproduction: Peak of egg-laying mid-June to late July. Monogamous. Clutch usually 2 eggs, rarely 1. Incubation 18-20 days, mostly by female (Bent 1940, Rust 1947). Often raises 2 broods; male feeding young of first while female incubates second (Weller 1958). Young semiprecocial; fledge at about 21 days after hatching (Bent 1940).

Niche: May be excluded from desert habitats by lesser nighthawk (Ehrlich *et al.* 1988).

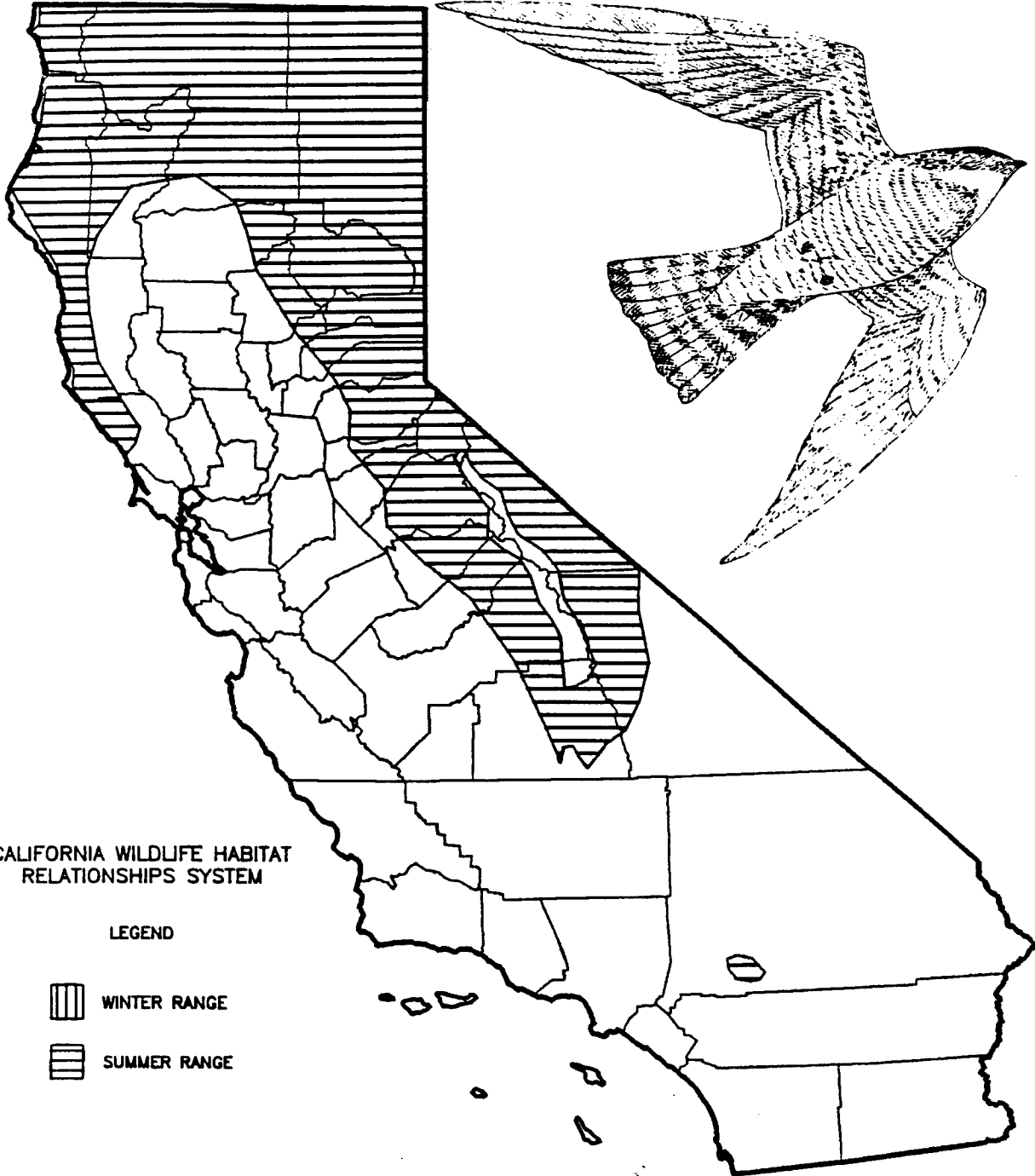
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COMMON NIGHTHAWK

AUTHORSHIP

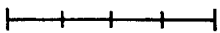
Species Note Prepared By: D. Gaines
Species Note Edited By: S. L. Granholm
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE


100 miles

05/87

B259 Yellow-billed Cuckoo *Coccyzus americanus*

Family: Cuculidae Order: Cuculiformes Class: Aves

Management Status: California Endangered Date: June 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California. Along the Colorado River, breeding population on California side estimated at 180 pairs (Gaines 1977a). Perhaps 100, or fewer, additional pairs reside in the Sacramento and Owens valleys; along the South Fork of the Kern River, Kern Co.; along the Santa Ana River, Riverside Co.; and along the Amargosa River, Inyo and San Bernardino cos. Also may nest along San Luis Rey River, San Diego Co. Formerly much more common and widespread throughout lowland California, but numbers drastically reduced by habitat loss (Grinnell and Miller 1944, Gaines 1974b, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Gleans grasshoppers, cicadas, caterpillars and other larger insects from foliage. Occasionally preys on frogs or lizards, or feeds on fruit (Bent 1940, Preble 1957).

Cover: Densely foliated, deciduous trees and shrubs, especially willows, required for roosting sites.

Reproduction: Nests in dense cover as above; nest is a flimsy, open cup of twigs built on horizontal limb of tree or shrub at height of 0.6 to 7.8 m (2-25 ft).

Water: Restricted when breeding to riverbottoms and other mesic habitats where humidity is high.

Pattern: Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant

component of the vegetation. In Sacramento Valley, also utilizes adjacent orchards, especially of walnut. Along Colorado River, may inhabit mesquite thickets where willow is absent. Nests typically in sites with at least some willow, dense low-level or understory foliage, high humidity, and wooded foraging spaces in excess of 93 m (300 ft) in width and 10 ha (25 ac) in area (Gaines 1974b, 1977a).

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Usually arrives from South American wintering areas in June, and departs by late August or early September.

Home Range: No information found.

Territory: No information found.

Reproduction: In California, most eggs laid mid-June to mid-July. Monogamous; clutch averages 3-4 eggs (range 1-5). Both sexes incubate; incubation lasts 9-11 days and hatching is asynchronous. Both sexes care for altricial young. Young may leave nest at 6-9 days (Bent 1940, Hamilton and Hamilton 1965).

Niche: Numbers in California and other western areas have declined markedly in recent decades with destruction of riparian habitats (Laymon and Halterman 1987).

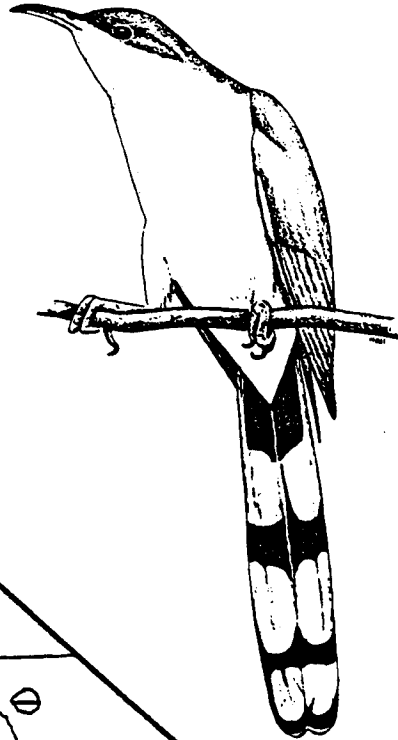
REFERENCES

Jay 1911, Shelton 1911, Hanna 1937, Bent 1940, Grinnell and Miller 1944, Preble 1957, Hamilton and Hamilton 1965, Gaines 1974b, 1977a, Nolan and Thompson 1975, Roberson 1980, Garrett and Dunn 1981, Laymon and Halterman 1987.

YELLOW-BILLED CUCKOO


AUTHORSHIP

Species Note Prepared By: D. Gaines
Species Note Edited By: R. Duke, S. L. Granholm
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

04/87

B275 Lesser Nighthawk *Chordeiles acutipennis*

Family: Caprimulgidae Order: Caprimulgiformes Class: Aves Date: June 24, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon summer resident in arid lowlands, primarily in desert scrub, desert succulent shrub, desert wash, and alkali desert scrub habitats. Also forages over grasslands, desert riparian, and other habitats with high densities of flying insects. Occurs north in the Sacramento Valley to Tehama Co. (Grinnell and Miller 1944) and southern Shasta Co., and to lower Mono Co. east of the Sierra Nevada (McCaskie *et al.* 1979). More common in desert areas of southeastern California. Casual in winter mostly in southeastern deserts. Transients sometimes noted on the Channel Islands in spring and summer, and rare in spring on Farallon Islands (DeSante and Ainley 1980).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds on insects, which it hawks on long, low flights over open areas. Also makes short flights from the ground in the manner of a common poorwill (Bent 1940).

Cover: Nests and roosts on bare sand and gravel surfaces; desert floor, along washes; sometimes uses levees and dikes for nesting. Forages over grasslands, open riparian areas, agricultural lands, and similar open habitats where insects thrive.

Reproduction: Nests in the open on gravelly or sandy substrate. Also uses dikes and levees for nesting.

Water: May drink while skimming over water surface (Bent 1940).

Pattern: Undisturbed gravel or sand surface for roosting and nesting; open lowlands, riparian areas, agricultural fields, or other insect-rich areas for foraging.

SPECIES LIFE HISTORY

Activity Patterns: Mostly a crepuscular and nocturnal forager; occasionally feeds in morning; roosts in the daytime. May become torpid in cold weather or when insects scarce.

Seasonal Movements/Migration: Arrives in California in April from Mexico and Central America (Bent 1940). Numbers increase rapidly, then diminish in August; mostly gone by mid-September. A few may overwinter in southern desert areas (Garrett and Dunn 1981). Rare but regular in spring on Farallon Islands (DeSante and Ainley 1980).

Home Range: Ranges far from nest in search of food (Caccamise 1974).

Territory: No data found. Little territorial behavior has been observed (Caccamise 1974), but may exclude common nighthawk from desert habitats (Ehrlich *et al.* 1988).

Reproduction: Nests from April through July, with peak activity in May and early June. Monogamous and solitary nester. Female incubates 2 eggs for 18-19 days; may raise 2 broods in a season (Pickwell and Smith 1938). Young are semiprecocial, and tended by both sexes (Harrison 1978). Young can walk soon after hatching; are fully feathered in 12 days, and fledge in about 3 wk.

Niche: Eggs and unfledged young subject to predation from mammals and snakes.

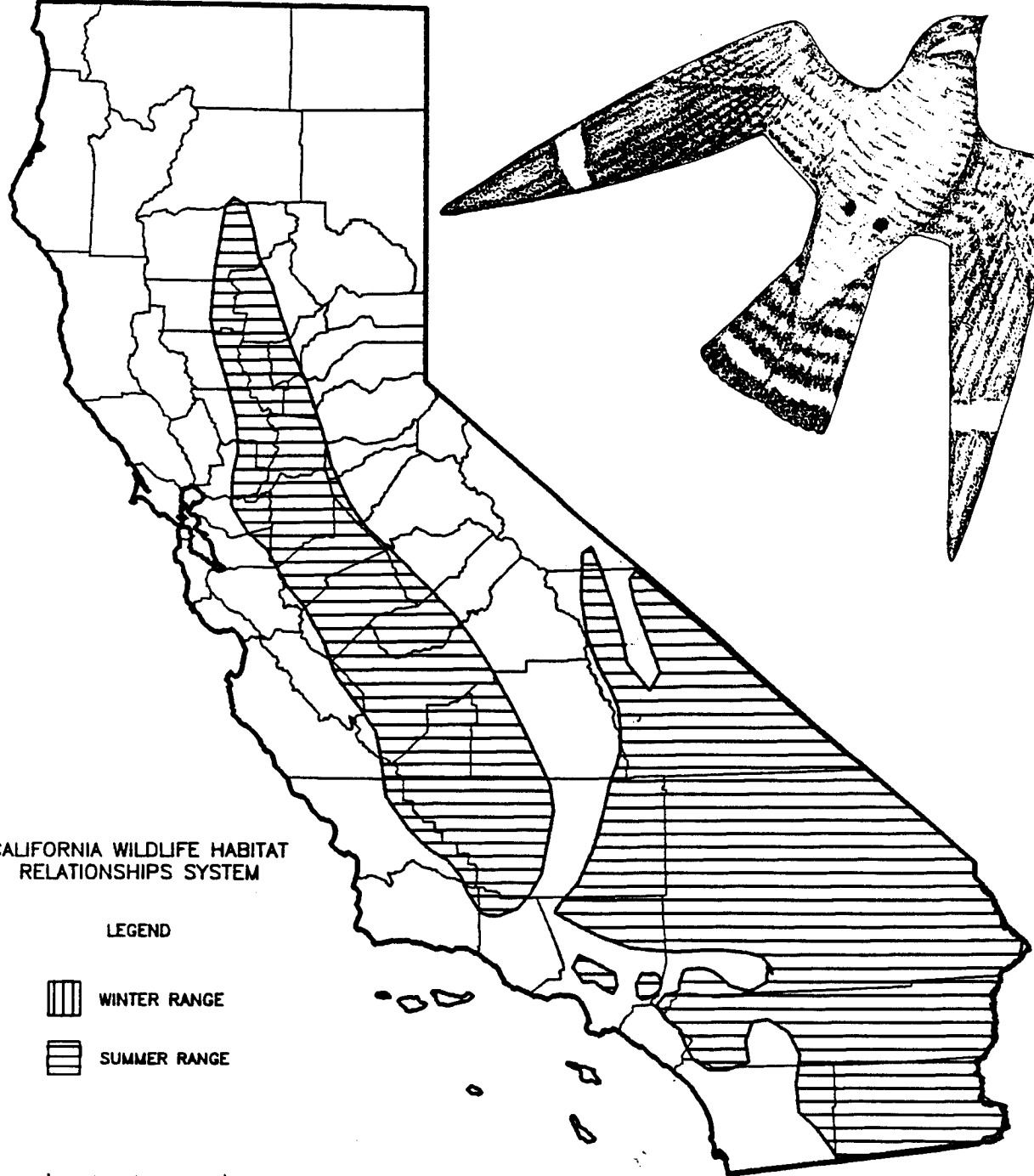
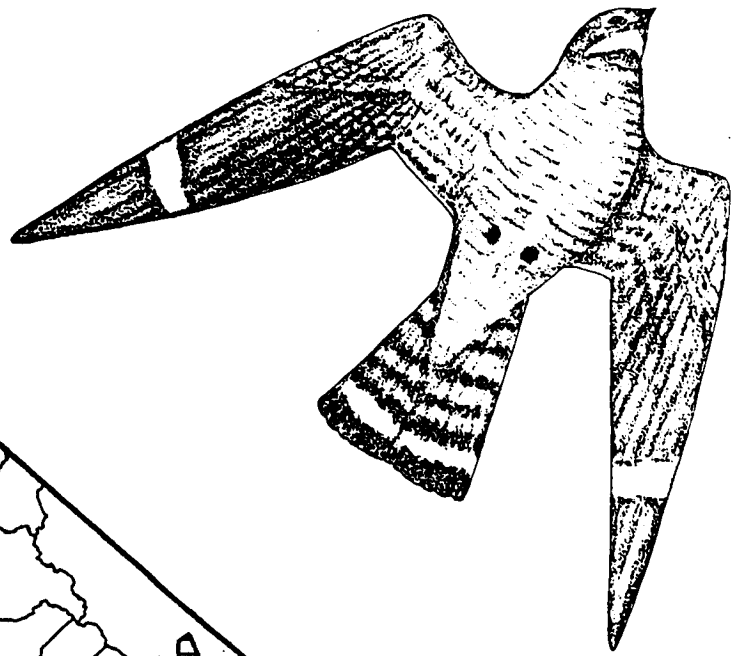
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LESSER NIGHTHAWK

AUTHORSHIP

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Species Note Edited By: D. Winkler, R. Duke
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B294 Lewis' Woodpecker *Melanerpes lewis*

Family: Picidae Order: Piciformes Class: Aves Date: February 1, 1982

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon, local winter resident occurring in open oak savannahs, broken deciduous, and coniferous habitats. Found along eastern slopes of the Coast Ranges south to San Luis Obispo Co. Also winters in the Central Valley, Modoc Plateau, and the Transverse and other Ranges in southern California. Breeds locally along eastern slopes of the Coast Ranges, and in the Sierra Nevada, Warner Mts., Klamath Mts., and in the Cascade Range.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Forages primarily on insects in spring and summer. In summer, 60% of feeding time was spent hawking insects, 30% foraging on ground and in brush, and 10% gleaning insects from trunks and branches of trees (Bock 1970). In late summer and fall, fruits and berries eaten frequently. Winter food mostly cached acorns, other nuts and seeds, and emerging insects. Caches acorns and other nuts in crevices and holes for use in nonbreeding season.

Cover: Requires open habitats with scattered trees and snags with cavities. Cover provided by cavities and foliage of trees and shrubs.

Reproduction: Excavates nest cavity in snag or dead part of live tree, usually 1.5 to 24 m (5-80 ft) above ground (Bock 1970, Raphael and White 1984). Usually nests in sycamore, cottonwood, oak, or conifer. May nest near other pairs.

Water: No data found.

Pattern: Suitable habitat includes open, deciduous and conifer habitats with brushy understory, and scattered snags and live trees for nesting and perching (Bock 1970). Uses logged and burned areas. Prefers oaks and acorns in winter.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Tends to wander in fall. Distance travelled depends on proximity of suitable habitat and acorn and other nut supplies. May form nomadic flocks in late summer and fall; moves into orchards, or moves higher in mountains (Bock 1970). Mountain populations usually move to lower areas for winter.

Home Range: No data found.

Territory: Nesting territory for a pair was 6 ha (15 ac); probably represented immediate vicinity of nest and feeding area (Bock 1970). Defends acorn and nut stores in fall and winter from conspecifics, acorn woodpecker, and other woodpeckers.

Reproduction: Breeds from early May through July, with peak in late May and early June. Clutch size 4-9, usually 6-7. Incubation probably 13-14 days; fledging occurs at 28-34 days. Male incubates and broods at night; pair alternate in daytime. Pair bond may be permanent.

Niche: Loss of habitat and nest sites to land cultivation and development has reduced breeding population in northern California (Bock 1970). Competition with acorn woodpeckers for stored mast has been reported (Bock 1970).

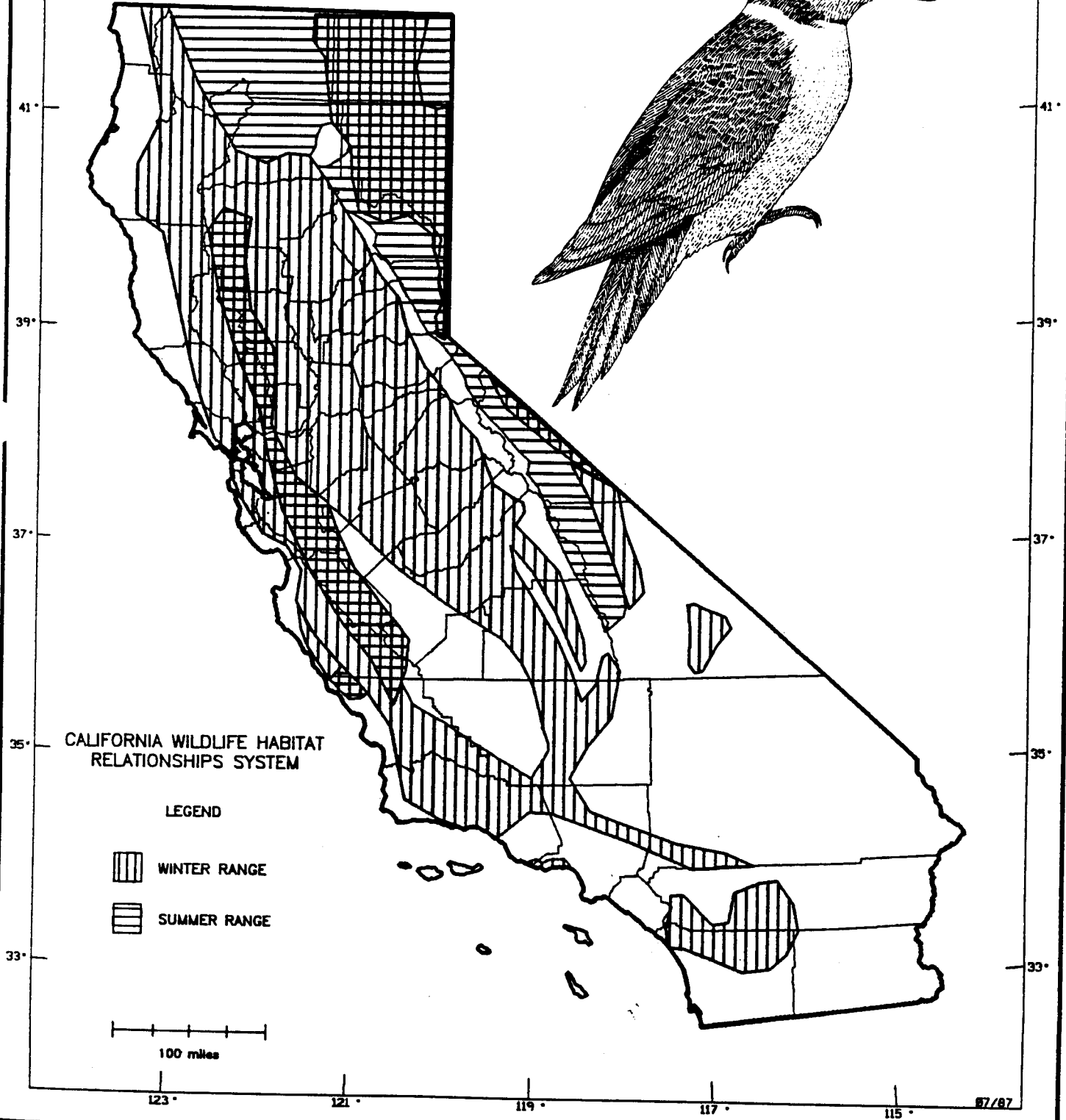
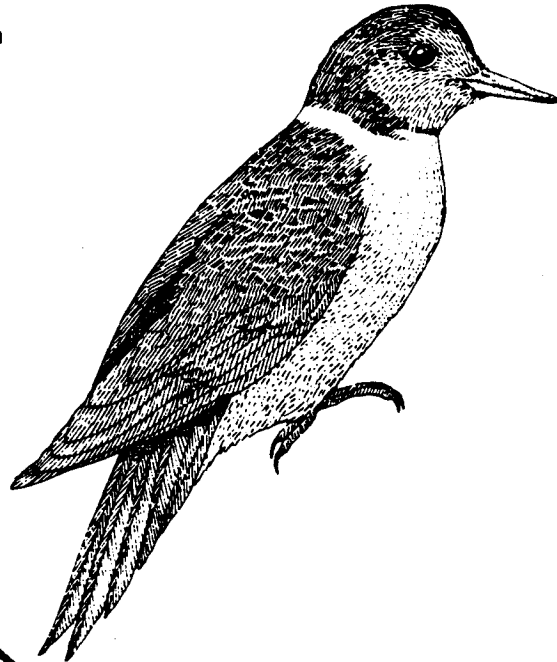
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LEWIS' WOODPECKER

AUTHORSHIP

Species Note Prepared By: T. E. Harvey, G. Ahlborn
Species Note Edited By: G. Ahlborn
Species Note Reviewed By: N. K. Johnson



B304 Hairy Woodpecker *Picoides villosus*

Family: Picidae Order: Piciformes Class: Aves Date: February 1, 1982

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A fairly common, permanent resident of mixed conifer and riparian deciduous habitats from sea level to 2700 m (0-9000 ft). Occurs the length of the state, but very scarce in portions of coastal southern California, Central Valley, Salinas Valley, Mojave and Colorado deserts, and Great Basin.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Approximately 80% of annual diet is animal matter; arthropods (beetles, ants, caterpillars, spiders, millipedes, aphids, other larvae). Also eats mast (acorns, hazelnuts, dogwood, cherry, serviceberry, pinenuts) and sap and cambium (Beal 1911, Bent 1939). Drills, pecks, and probes in crevices of bark of dead and live trees, logs, and stumps. Often congregates to feed in insect-infested or burned areas (Koplin 1969).

Cover: Uses stands of large, mature trees and snags of sparse to intermediate density. Cover provided also by cavities.

Reproduction: Excavates nest cavity from 0.9 to 31 m (3-102 ft) above ground in soft interior of snag or dead branch (Raphael and White 1984) in larch, sycamore, willow, fir, or other species (Lawrence 1967). Nest tree diameter (dbh) averaged 44 cm (17 in), and ranged from 34-76 cm (13-30 in) (Lawrence 1967).

Water: No additional information found, but frequents riparian habitats.

Pattern: Uses relatively open or patchy stands of conifers with adjacent riparian habitats and abundant snags. Tree/shrub, tree/herbaceous, and shrub/herbaceous ecotones important. In the Blue Mts. of Oregon and Washington, Thomas (1979) estimated that 446 snags per 100 ha (180 per 100 ac) of 25 cm (10 in) dbh minimum would support maximum populations.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: In fall and winter, may move downslope into valley foothill hardwood-conifer habitats.

Home Range: Territory and home range apparently the same.

Territory: In a mature conifer forest in central Ontario, Lawrence (1967) found that breeding territory averaged 2.8 ha (7 ac), and ranged from 2.4 to 3.2 ha (6-8 ac). Exhibits intraspecific defense of nest (Dawson 1923), and interspecific defense of feeding sites (Bendire 1895). Male and female may have separate fall and winter territory (Kilham 1965).

Reproduction: As with most woodpeckers, male drums on dry, resonant limbs to attract female (Ridgway 1914). Breeds from mid-March to late August; peak nesting activity late May through June. Average clutch 4 eggs; range 3-6. One brood per yr. Male and female dig cavity, incubate eggs, and care for altricial young. Incubation lasts about 12 days (Bendire 1895). Pair may remain together for several years (Willard 1918, Carpenter 1919).

Niche: Interspecific competition for food between hairy and downy woodpeckers apparently reduced by feeding on different species of tree (Kisiel 1972), and in different locations in same tree. Abandoned cavities provide cover for many other species. May be important in reducing populations of adult and larval bark beetles (Otvos 1979).

Comments: Numbers apparently declining in recent decades (Ehrlich *et al.* 1988).

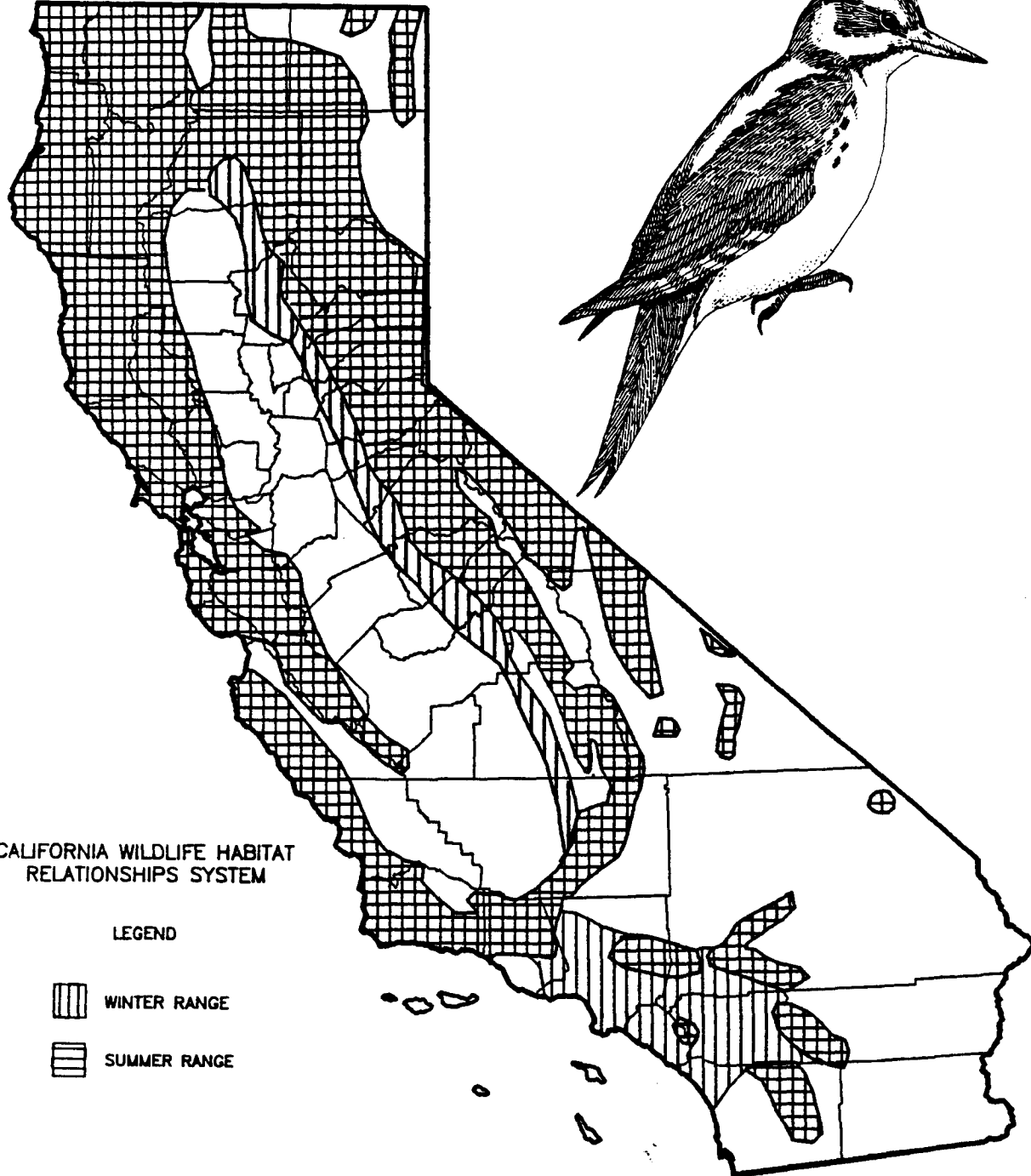
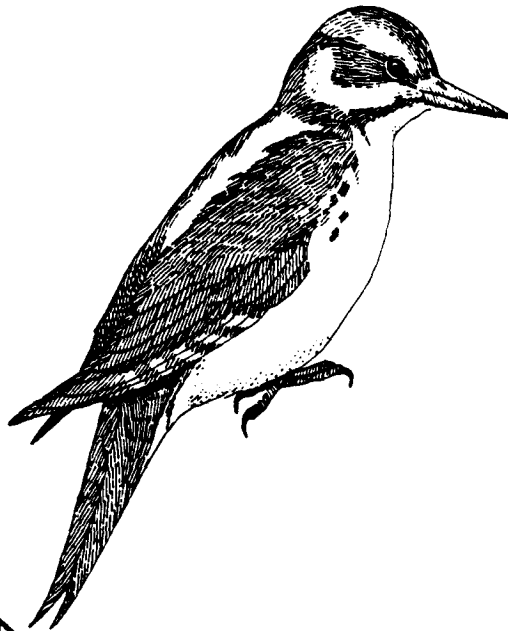
REFERENCES

Bendire 1895, Beal 1911, Ridgway 1914, Willard 1918, Carpenter 1919, Dawson 1923, Bent 1939, Grinnell and Miller 1944, Kilham 1965, Selander 1965, Lawrence 1967, Koplin 1969, Kisiel 1972, Otvos 1979, Thomas 1979, Raphael and White 1984, Ehrlich *et al.* 1988.

HAIRY WOODPECKER

AUTHORSHIP

Species Note Prepared By: G. Ahlborn
Species Note Edited By: G. Ahlborn
Species Note Reviewed By: N. K. Johnson



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B315 Willow Flycatcher *Empidonax traillii*

Family: Tyrannidae Order: Passeriformes Class: Aves

Management Status: California Species of Special Concern, U.S. Forest Service Sensitive

Date: July 21, 1983

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). 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).

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: A California Species of Special Concern (Remsen 1978). Formerly known as Traill's flycatcher (Grinnell and Miller 1944). *Empidonax* flycatchers are very difficult to identify in the field.

REFERENCES

Bent 1942, Grinnell and Miller 1944, Aldrich 1953, Berger and Parmelee 1952, King 1955, Berger 1957, Stein 1963, Walkinshaw 1966, Holcomb 1972, Gaines 1977a, 1977b, Remsen 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981, Serena 1982, Ehrlich *et al.* 1988.

WILLOW FLYCATCHER

AUTHORSHIP

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Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

06/87

B380 Western Bluebird *Sialia mexicana*

Family: Muscicapidae Order: Passeriformes Class: Aves Date: November 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Fairly common to common year-round throughout much of California, excluding the higher mountains and eastern deserts. Breeds in open woodlands of oaks, riparian deciduous trees, or conifers with herbaceous understory. In winter, uses more open habitats as well. Sparse to open-canopied, mature, valley foothill and montane hardwood and valley foothill hardwood-conifer habitats are optimal. A variety of other coniferous habitats are used, primarily open-canopied mature forests, especially edges. In winter, leaves higher portions of nesting range and becomes more widespread in lowlands. East of the Sierra Nevada crest, breeds south to Lake Tahoe Basin and in Owens Valley, Inyo Co. Rare in eastern deserts of southern California, but breeds in small numbers from Panamint Mts. to Clark Mt., and winters fairly commonly in the Colorado River Valley (Grinnell and Miller 1944, McCaskie *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Primarily eats insects, including grasshoppers, caterpillars, beetles, and ants; also eats earthworms, snails, and other small arthropods (Bent 1949). Flies out from low perch to capture prey on ground or herbage; sometimes hovers before pouncing. Also hawks aerial insects. Perches on low branch of tree or shrub, fence, or tall herb; often adjacent to medium to large opening in wooded or brushy habitat. In nonbreeding season, supplements diet with berries of mistletoe, poison-oak, elderberry, and other species. Presence of mistletoe berries may govern local occurrence in winter (Pitelka 1941, Grinnell and Miller 1944).

Cover: Requires trees and shrubs for cover. Typically rests in tree when not foraging, but also uses fence or shrub. Uncommon in habitats without at least a few trees or large shrubs, even in winter. Nests and roosts in cavity in tree or snag.

Reproduction: Usually nests in old woodpecker hole in snag, tree, or stump; also uses other cavity or nest box (Scott *et al.* 1977). Occasionally uses nest of cliff swallow or other species (Bent 1949). Nests in Monterey Co. were 1.5 to 12 m (5-39 ft) above ground (Bent 1949).

Water: Drinks water freely and regularly (Gander 1960, Smyth and Coulombe 1971), but may not require water when berries are available.

Pattern: Frequents open woodlands. Requires suitable nesting and roosting cavity, usually in a snag or tree near open habitat for foraging; also low perches to search for prey. Availability of snags frequently limits population density (Ross 1933, Raphael and White 1978, Ehrlich *et al.* 1988).

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: A resident in much of its California range, but undergoes local and irregular movements in many areas. In Sierra Nevada, small flocks move upslope in late summer and fall (Gaines 1977b). Withdraws from higher mountains in winter, and may move into lowland areas not occupied while breeding. None recorded on Farallon Islands (DeSante and Ainley 1980).

Home Range: Home range in Arizona ponderosa pine forest varied from 0.3 to 0.8 ha (0.7 to 1.9 ac) and averaged 0.46 ha (1.13 ac) (Balda 1975). Breeding density in this habitat was 15 pairs per 40 ha (100 ac) (Haldeman *et al.* 1973). Wilson (1978) found 37 per 100 ha (15 per 100 ac) at Morongo Valley, San Bernardino Co. in winter. Miller and Stebbins (1964) noted flocks of up to 25-50 individuals in winter at Joshua Tree National Monument. Anderson (1970) reported a wintering population of 8-20 per 40 ha (100 ac) in an Oregon white oak forest.

Territory: No data found, but probably equal to home range.

Reproduction: Breeds from April into July. A monogamous, solitary nester. Clutch size 3-8, average 5. Frequently double-brooded. Incubation lasts 13-14 days. Altricial young tended by both parents. Male may tend fledglings while female renests. Probably breeds first at 1 yr (Harrison 1978).

Niche: Competition from European starlings and house sparrows has reduced eastern bluebird populations in parts of the eastern U.S., and threatens western bluebirds. Construction of nest boxes with smaller entrance holes (Scott *et al.* 1977) has allowed a partial population recovery of eastern bluebirds. Western bluebirds also compete for nest sites with violet-green swallows, house wrens, and other native species; generally are more capable of defending nest against native species (Bent 1949). Competition with woodpeckers for nest sites may be strong (Miller and Bock 1972).

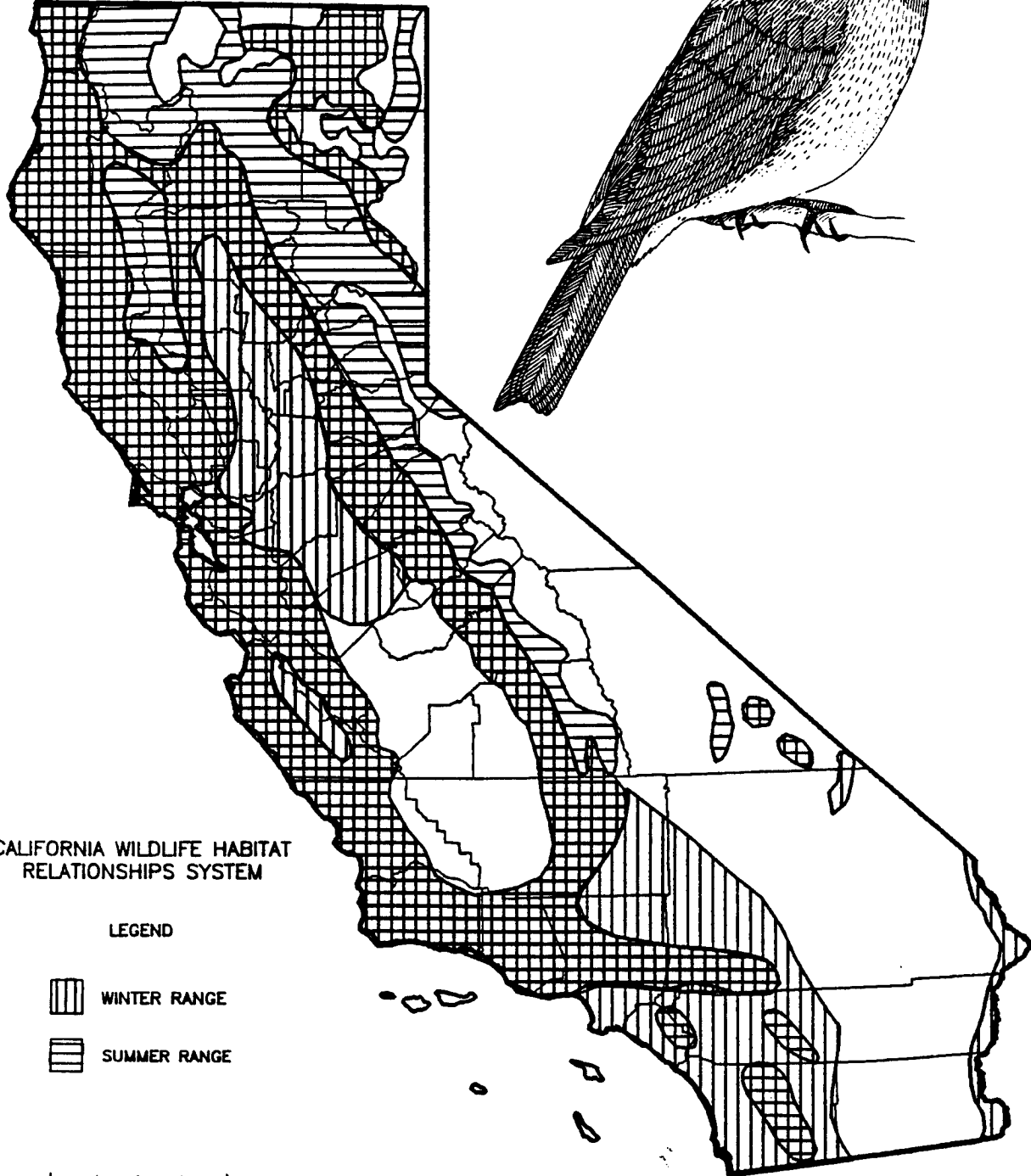
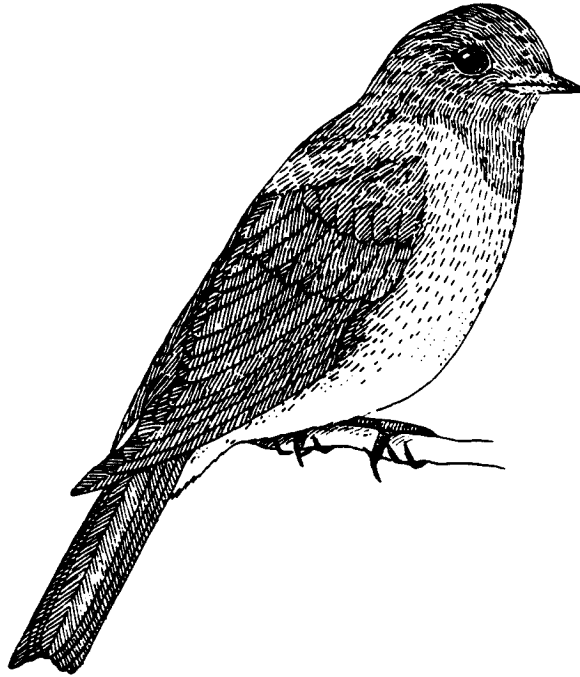
REFERENCES

Ross 1933, Pitelka 1941, Grinnell and Miller 1944, Bent 1949, Gander 1960, Miller and Stebbins 1964, Anderson 1970, Smyth and Coulombe 1971, Miller and Bock 1972, Haldeman *et al.* 1973, Balda 1975, Jackman and Scott 1975, Gaines 1977b, Scott *et al.* 1977, Harrison 1978, Raphael and White 1978, Wilson 1978, McCaskie *et al.* 1979, Airola 1980, DeSante and Ainley 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

WESTERN BLUEBIRD

AUTHORSHIP

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Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

8413 Bell's Vireo *Vireo bellii*

Family: Vireonidae Order: Passeriformes Class: Aves

Management Status: *V. b. arizonae*, California Endangered; *V. b. pusillus*, Federal Endangered, California Endangered Date: November 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Formerly a common and widespread summer resident below about 600 m (2000 ft) in western Sierra Nevada, throughout Sacramento and San Joaquin valleys, and in the coastal valleys and foothills from Santa Clara Co. south. Also was common in coastal southern California from Santa Barbara Co. south, below about 1200 m (4000 ft) east of the Sierra Nevada, in Owens and Benton valleys, along Mojave River and other streams at western edge of southeastern deserts, and along entire length of Colorado River (Grinnell and Miller 1944). Has declined drastically or vanished entirely throughout California range in recent decades, apparently from cowbird parasitism and habitat destruction and degradation (Goldwasser *et al.* 1980). Two races occur in California. *V. b. pusillus* (endemic to California and northern Baja California) is now a rare, local, summer resident below about 600 m (2000 ft) in willows and other low, dense valley foothill riparian habitat and lower portions of canyons mostly in San Benito and Monterey cos.; in coastal southern California from Santa Barbara Co. south; and along the western edge of the deserts in desert riparian habitat. In 1977-78, 67 males or paired individuals were counted at 23 of 65 sites surveyed on the coastal slope of southern California, and 23 at 9 of 18 sites on the desert slope (Goldwasser *et al.* 1980, Garrett and Dunn 1981). *V. b. arizonae* now is a rare summer resident along the Colorado River from Needles, San Bernardino Co., south to Blythe, Riverside Co. Bell's vireo (race uncertain) also breeds in at least 2 sites along Amargosa River near Tecopa, Inyo Co. (Gaines 1977c, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Gleans insects from foliage and branches, usually within 2.5 m (8 ft) of ground. Eats some fruits (Bent 1950).

Cover: Thickets of willow and other low shrubs afford nesting and roosting cover.

Reproduction: Builds an open-cup nest of pieces of bark, fine grasses, plant down, horse hair. Nest often placed on slender branch of willow, other shrub, mesquite, or other small tree, usually 0.6-0.9 m (2-3 ft), but sometimes 0.3-3.0 m (1-10 ft), above ground.

Water: Usually found near water, but also inhabits thickets along dry, intermittent streams.

Pattern: Inhabits low, dense riparian growth along water or along dry parts of intermittent streams. Typically associated with willow, cottonwood, baccharis, wild blackberry, or mesquite in desert localities.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Usually arrives from Mexican wintering areas by end of March, and departs by end of August.

Home Range: In Indiana, Nolan (1960) reported a home range of 0.8-1.2 ha (2.0-3.0 ac). In breeding season, home range probably equal to territory. In Illinois, Pitelka and Koestner (1942) reported 1 pair per 1.2 ha (3 ac), and Hensley (1950) reported 1 pair per 1.3 ha (3.1 ac). In Arizona mesquite thickets, Barlow *et al.* (1970) found 1 pair per 0.8 ha (2 ac).

Territory: In Kansas, Barlow (1962) reported average territory of 0.5 ha (1.25 ac), range 0.1-1.3 ha (0.26 to 3.1 ac).

Reproduction: Peak egg laying May into early June. Monogamous. Clutch averages 4 eggs (range 3-5). Incubation 14 days, by both sexes. Both sexes care for altricial young, which usually fledge 11-12 days after hatching (Pitelka and Koestner 1942, Hensley 1950, Nolan 1960, Barlow 1962).

Niche: Frequently parasitized by cowbirds. Eggs lost to snakes and cats (Bent 1950, Nolan 1960, Cink 1977).

Comments: Numbers so low that may be nearing extinction in California. *V. b. arizonae* is California Endangered. *V. b. pusillus* is Federal Endangered and California Endangered (California Department of Fish and Game 1989).

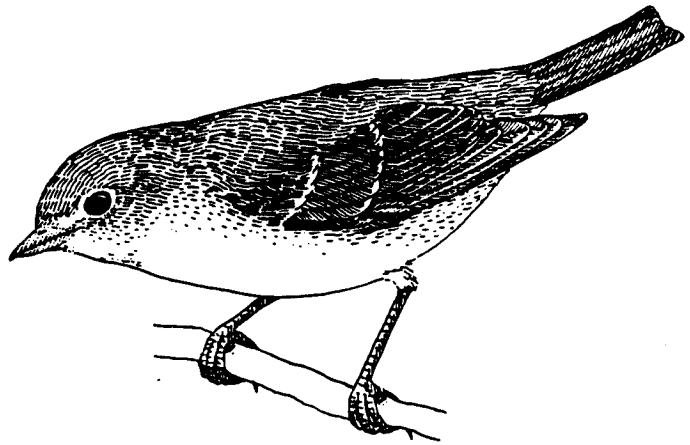
REFERENCES

Bennett 1917, Nice 1929, Pitelka and Koestner 1942, Grinnell and Miller 1944, Bent 1950, Hensley 1950, Mumford 1952, Nolan 1960, Barlow 1962, Overmire 1962, Barlow *et al.* 1970, Hibbard and Kline 1971, Cink 1977, Gaines 1977c, Remsen 1978, Goldwasser *et al.* 1980, Garrett and Dunn 1981, California Department of Fish and Game 1989.

BELL'S VIREO

AUTHORSHIP

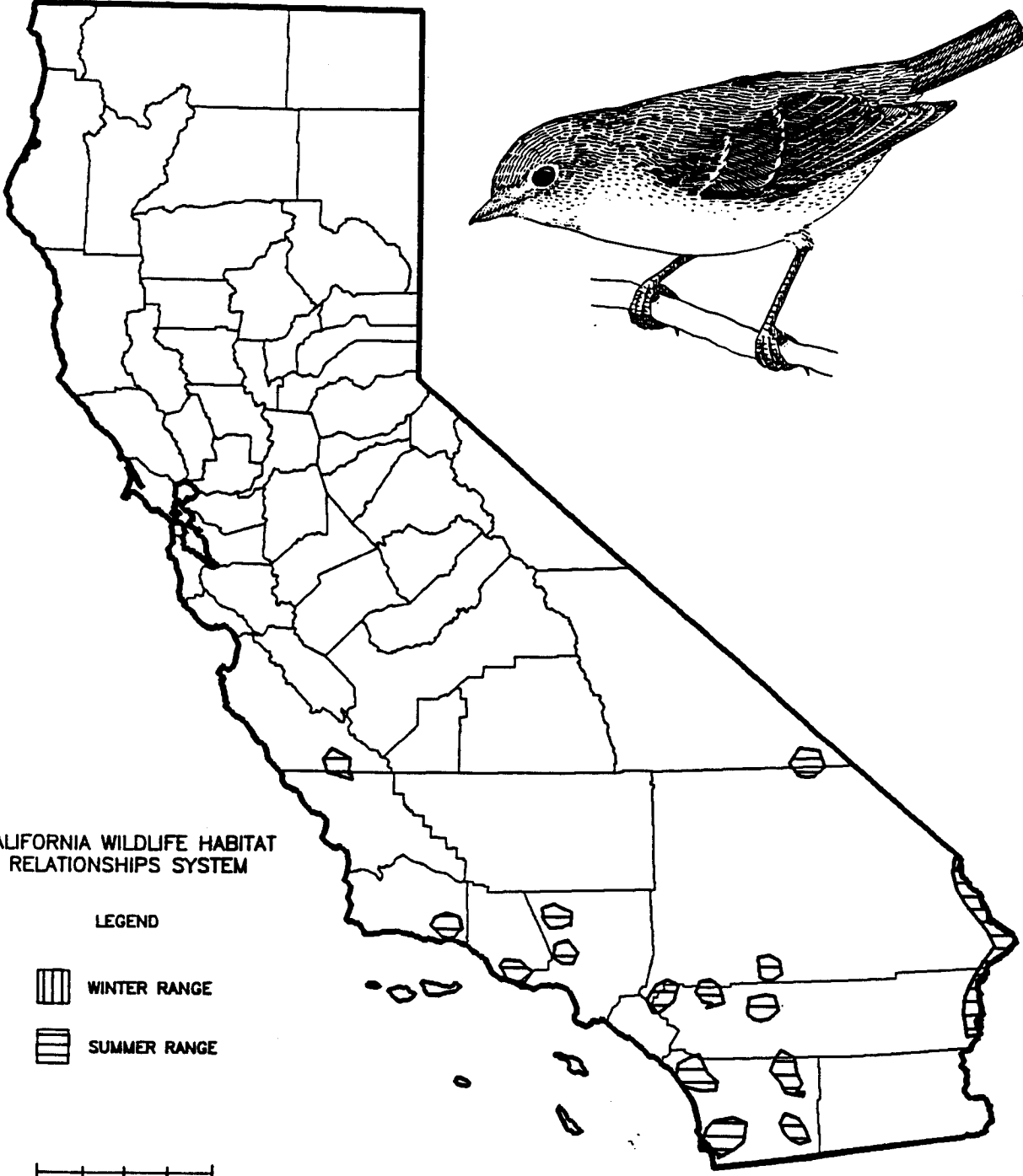
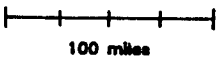
Species Note Prepared By: D. Gaines
Species Note Edited By: R. Duke
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE



B430 Yellow Warbler *Dendroica petechia*

Family: Emberizidae Order: Passeriformes Class: Aves

Management Status: California Species of Special Concern Date: July 6, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon to common, summer resident in the north; locally common in the south. Rare but regular in winter in the south. 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 Iowa (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).

Comments: A California Species of Special Concern (Remsen 1978).

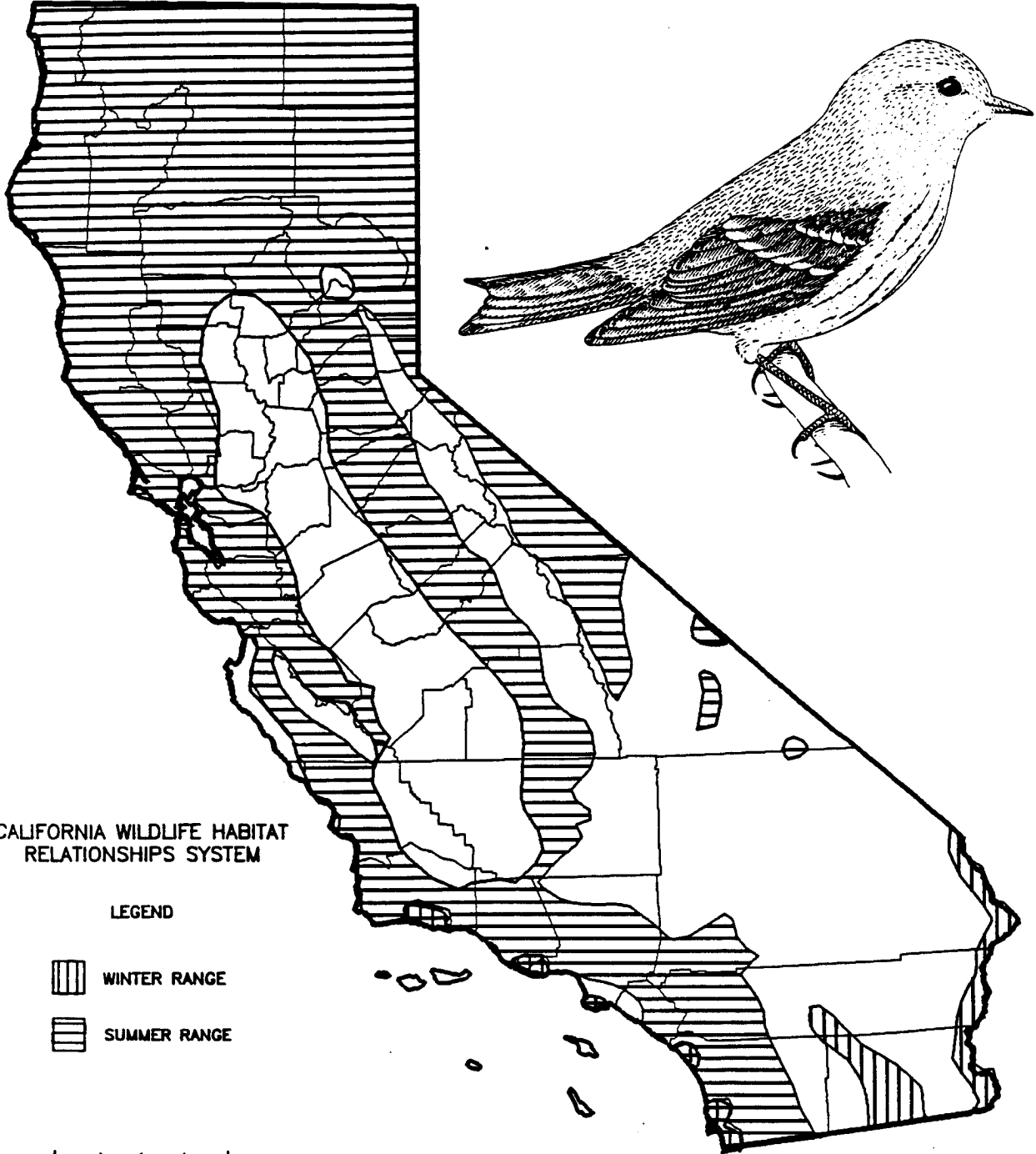
REFERENCES

Kendeigh 1941a, Bent 1953, Beer *et al.* 1956, Ficken and Ficken 1966, Smyth and Coulombe 1971, Beedy 1975, Gaines 1977b, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, DeSante and Ainley 1980, Rothstein *et al.* 1980, Garrett and Dunn 1981, Verner and Ritter 1983, Airola 1986, Ehrlich *et al.* 1988.

YELLOW WARBLER

AUTHORSHIP

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Species Note Reviewed By: L. R. Mewaldt, D. A. Airola



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B461 Common Yellowthroat *Geothlypis trichas*

Family: Emberizidae Order: Passeriformes Class: Aves
Management Status: *G. t. sinuosa*, California Species of Special Concern
Date: September 29, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A common summer resident, fairly common winter resident, and transient. A common resident on central and southern coast; less common on north coast, where there are only 2 winter records north of Sonoma Co. (McCaskie *et al.* 1979). Less common as a breeder in interior, especially in Central Valley (McCaskie *et al.* 1979). Generally uncommon in interior in winter. Primarily a transient in desert areas, through Sierra Nevada, and other mountain ranges. Some remain to breed in deserts (Garrett and Dunn 1981) and Sierra Nevada (Verner and Boss 1980). Mostly breeds and winters in wet meadow, fresh emergent wetland, and saline emergent wetland habitats; also breeds in valley foothill riparian, and occasionally in desert riparian, annual grassland, and perennial grassland habitats. In migration, found in other moist habitats with low, dense cover. A fairly common transient on Farallon and Channel Islands, especially in fall (DeSante and Ainley 1980, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats insects, especially caterpillars and other larvae; also spiders and a few seeds. Gleans wetland herbage and shrubs (Bent 1953).

Cover: Mostly seeks cover in thick tangles in fresh and brackish wetlands. Occasionally breeds in dense shrubs and lush fields (Garrett and Dunn 1981). Many brushy habitats used in migration.

Reproduction: Nest usually placed on or within 8 cm (3 in) of ground. May be over water, in emergent aquatic vegetation, dense shrubs, or other dense growth.

Water: Inhabits wetlands, especially in summer and winter. May drink water.

Pattern: Frequents low, dense vegetation near water.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Nocturnal migrant.

Seasonal Movements/Migration: Resident in southern California (Garrett and Dunn 1981) and San Francisco Bay area. Absent or uncommon in winter from interior breeding locations and from north coast. Occurrence on Farallon and Channel Islands suggests breeders from north of California migrate through, mostly in fall.

Home Range: Home range of a polygynous male was 1.4 ha (3.4 ac); 10 home ranges held by monogamous pairs averaged 0.5 ha (1.3 ac), varying from 0.3 to 0.7 ha (0.8 to 1.8 ac), in Michigan marsh and riparian habitats (Stewart 1953). Kendeigh (1945) reported that 7 pairs were spaced uniformly over 2.0 to 2.4 ha (5-6 ac) in a New York brushfield.

Territory: Probably equal to home range (Airola 1980). Brewer (1955) reported 5 territories averaged 0.2 ha (0.6 ac), range 0.1 to 0.4 ha (0.2 to 1.1 ac), in an Illinois swamp. Average territory size was 0.3 ha (0.7 ac) in Minnesota, and 0.7 ha (1.7 ac) in Michigan (Hofslund 1960). Foster (1977) recorded 86 territories on and near San Francisco Bay varying from 0.2 to 2.0 ha (0.6 to 4.4 ac), average 0.67 ha (1.5 ac).

Reproduction: Breeds from early April to mid-July, with peak activity in May and June. Usually monogamous; occasionally polygynous. Lays 3-6 eggs, average 4. Female incubates for 12 days. Altricial young tended by both parents until fledging at 9-10 days (Harrison 1978).

Niche: Subject to predation from snakes, accipiters, and small mammals. Parasitized frequently by brown-headed cowbirds (Bent 1953, Ehrlich *et al.* 1988).

Comments: *G. t. sinuosa*, the saltmarsh common yellowthroat, is a California Species of Special Concern. Inhabits emergent wetland. Resident and summer visitant in San Francisco Bay area, and winters south along coast to San Diego Co. (Grinnell and Miller 1944).

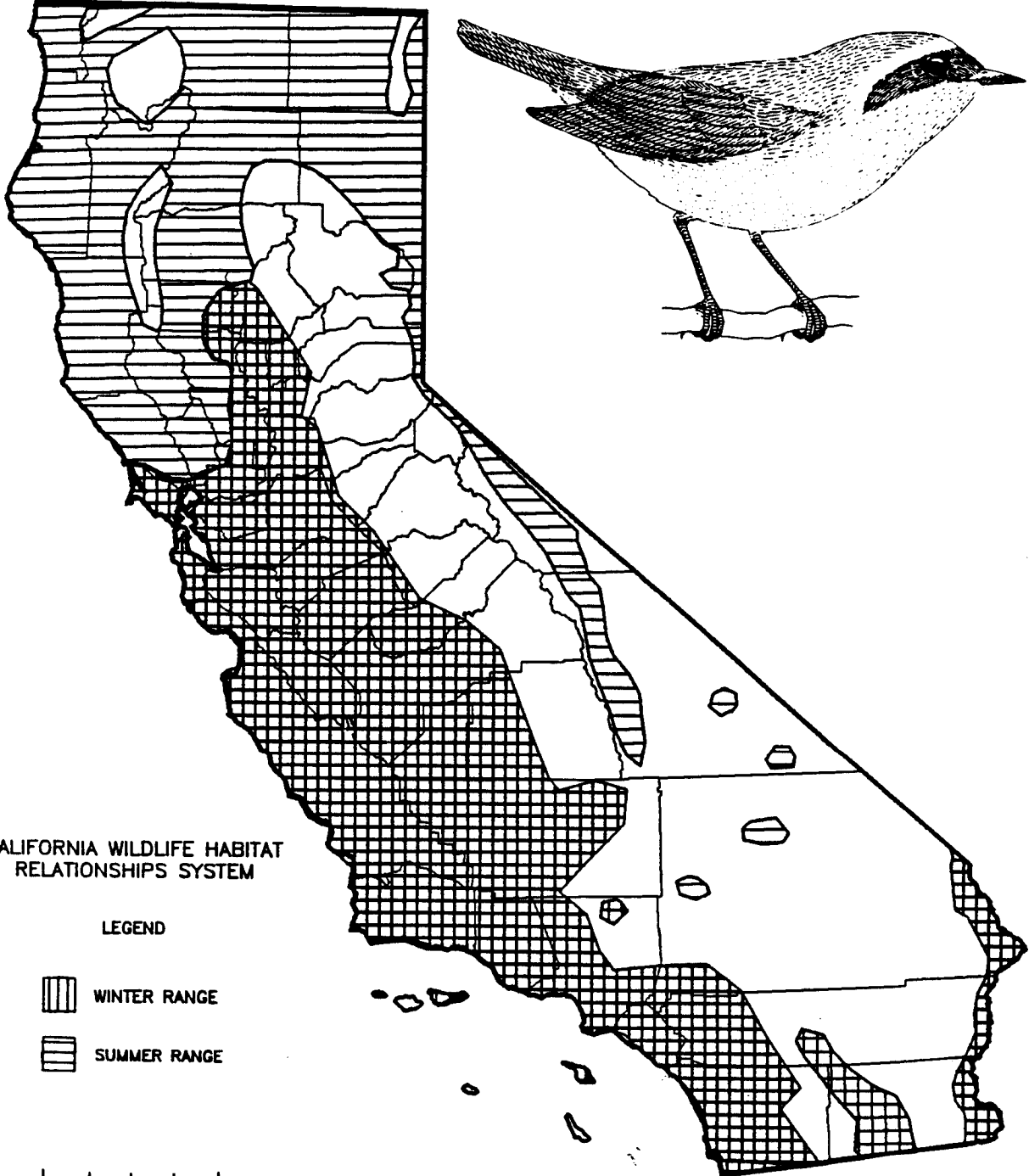
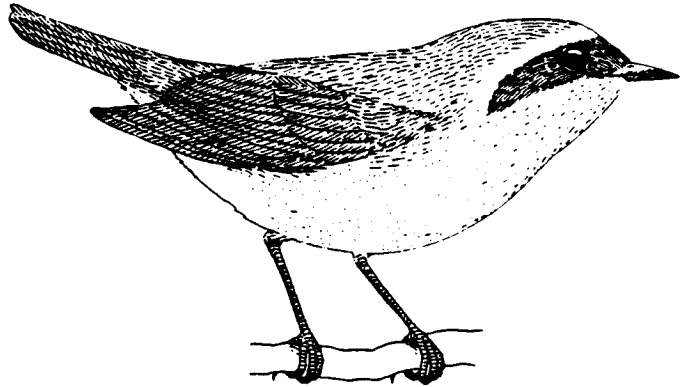
REFERENCES

Grinnell and Miller 1944, Kendeigh 1945, Bent 1953, Stewart 1953, Brewer 1955, Hofslund 1960, Foster 1977, Harrison 1978, McCaskie *et al.* 1979, Airola 1980, DeSante and Ainley 1980, Verner and Boss 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

COMMON YELLOWTHROAT

AUTHORSHIP

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Species Note Edited By: D. Winkler, R. Duke
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B467 Yellow-breasted Chat *Icteria virens*

Family: Emberizidae Order: Passeriformes Class: Aves
Management Status: California Species of Special Concern Date: June 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada. Found up to about 1450 m (4800 ft) in valley foothill riparian, and up to 2050 m (6500 ft) east of the Sierra Nevada in desert riparian habitats (Gaines 1977b, DeSante and Ainley 1980, Garrett and Dunn 1981). Uncommon along coast of northern California and occurs only locally south of Mendocino Co. (McCaskie *et al.* 1979). In southern California, breeds locally on the coast and very locally inland (Garrett and Dunn 1981). In migration, may be found in lower elevations of mountains in riparian habitat (McCaskie *et al.* 1979). Numbers much reduced in recent decades (Remsen 1978).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats insects and spiders; also berries and other fruits. Mostly gleans from foliage of shrubs and low trees.

Cover: Requires riparian thickets of willow and other brushy tangles near watercourses for cover.

Reproduction: Nest usually 0.6 to 2.4 m (2–8 ft) above ground in dense shrubs along a stream or river.

Water: Bathing recorded by Kinsey (1934).

Pattern: Frequents dense, brushy thickets and tangles near water, and thick understory in riparian woodland.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. Nocturnal migrant.

Seasonal Movements/Migration: Usually arrives in April and departs by late September for wintering

grounds in Mexico and Guatemala. May wander upslope postbreeding (Gaines 1977b). There are a few late fall and winter records, mostly from southern California. Migrants sometimes pass through lower elevations in mountains.

Home Range: Dennis (1958) reported that home range in summer was larger than territory, but gave no sizes. Gaines (1974a) reported 10 per 40 ha (100 ac) in a Sacramento Valley riparian area.

Territory: Thompson and Nolan (1973) reported 28 territories averaging 1.3 ha (3.1 ac) in an abandoned Indiana field. Brewer (1955) reported territory averaging 0.12 ha (0.3 ac), and varying from 0.04 to 0.28 ha (0.1 to 0.7 ac), in an Illinois swamp thicket. Dennis (1958) reported territory varying from 0.5 to 1.0 ha (1.25 to 2.5 ac) in abandoned fields and fence rows in Virginia.

Reproduction: Breeds from early May into early August with peak activity in June. Monogamous, although pairs may nest near one another (Ehrlich *et al.* 1988). Lays 3–6 eggs, usually 3 or 4. Incubation 11–15 days; chicks apparently fledge in 8–11 days. Altricial young tended by both parents until fledging (Harrison 1978).

Niche: Subject to occasional predation by accipiters, small mammals, and snakes. Loss and degradation of riparian habitat have caused a marked decline in the breeding population in recent decades in California. Parasitism by brown-headed cowbirds also has contributed to the decline (Gaines 1974a, Remsen 1978).

Comments: A California Species of Special Concern (Remsen 1978).

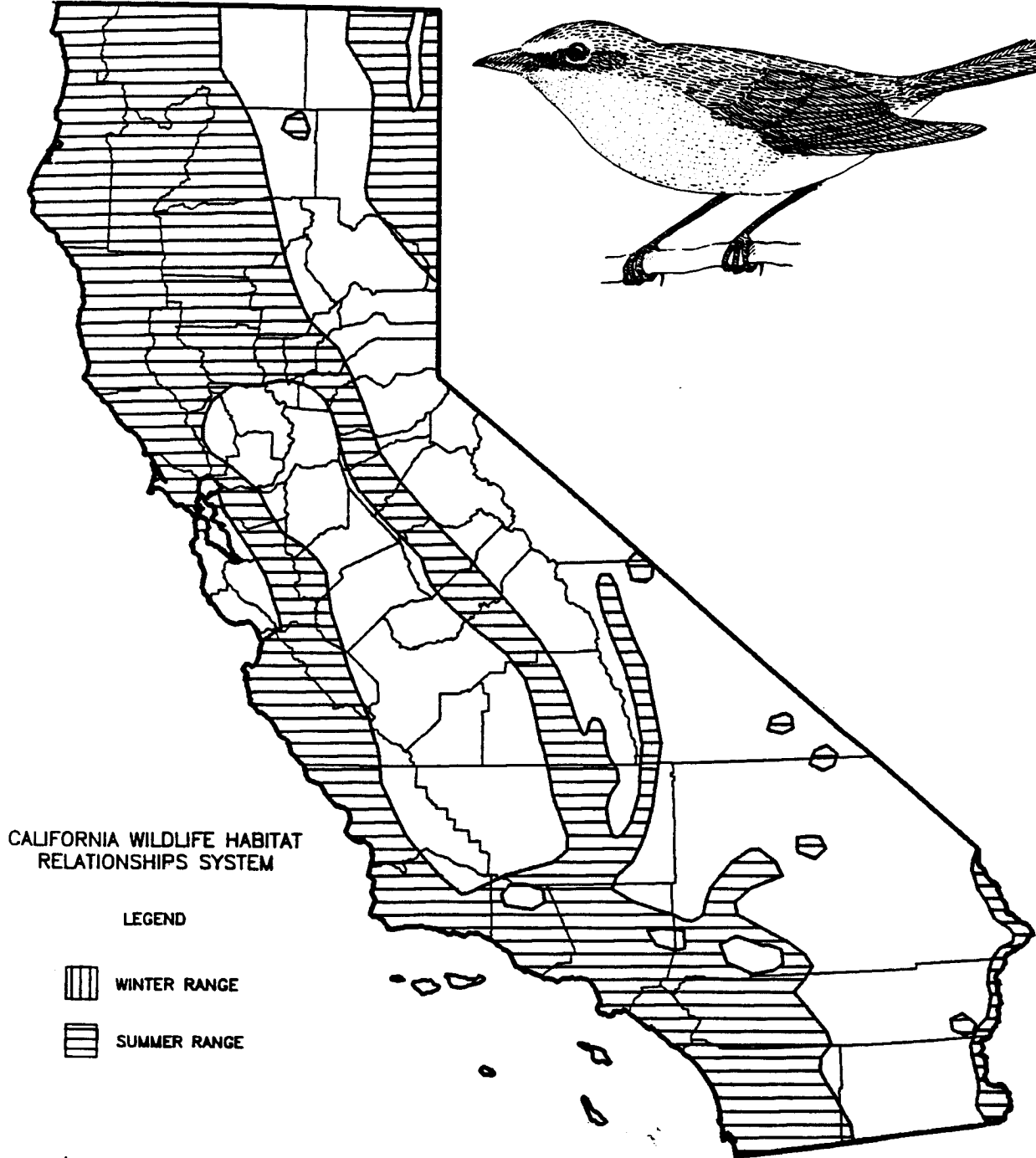
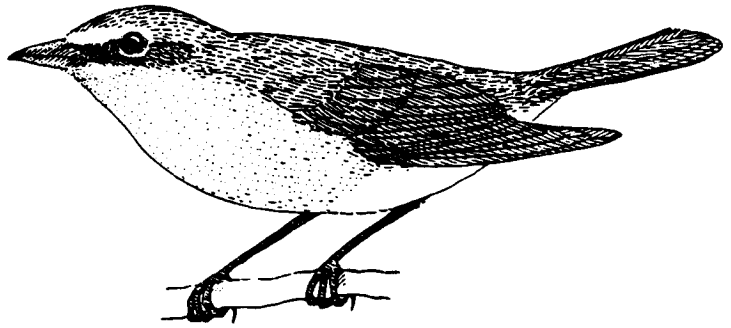
REFERENCES

Kinsey 1934, Brewer 1955, Dennis 1958, Thompson and Nolan 1973, Gaines 1974a, 1977b, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, DeSante and Ainley 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

YELLOW-BREASTED CHAT


AUTHORSHIP

Species Note Prepared By: M. Green
Species Note Edited By: D. Winkler, R. Duke
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

B469 Summer Tanager *Piranga rubra*

Family: Emberizidae Order: Passeriformes Class: Aves

Management Status: California Species of Special Concern Date: September 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon (formerly common) summer resident and breeder in desert riparian habitat along lower Colorado River; also occurs very locally elsewhere in southern California deserts. Found in additional desert and other localities in migration. It is a rare but regular migrant and winter visitor along the coast, mostly from Los Angeles Co. southward; scattered records occur in northern California. Breeds in mature, desert riparian habitat dominated by cottonwoods and willows (Grinnell and Miller 1944, McCaskie *et al.* 1979, 1988, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats insects, spiders, and small fruits. Gleans from foliage and bark, and hawks flying insects. Eats many bees and wasps; often takes larvae from hives and nests (Bent 1958).

Cover: Cottonwoods and willows, especially older, dense stands along rivers and streams, provide nesting, feeding, and other cover.

Reproduction: Builds nest 3–6 m (10–20 ft) above ground on a large, horizontal limb of a cottonwood or willow or other riparian deciduous tree.

Water: No additional information found.

Pattern: Frequents cottonwood-willow associations of riparian habitats for breeding, feeding, cover, and other activities.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Arrives on summer breeding grounds in April and usually departs by September. Transients occur elsewhere in interior mostly in May and June and September into November. Occurs along coast rarely but regularly from September to March and May to June.

Home Range: No data found.

Territory: In deciduous forest and edge habitat in Kansas, Fitch and Fitch (1955) estimated territory at 1.7 ha (4.2 ac). May hold a feeding territory in winter (Ehrlich *et al.* 1988).

Reproduction: Breeding season lasts from May into early August with a peak in June. Clutch size 3–5, usually 4 (Bent 1958). Incubation apparently about 12 days (Terres 1980). Altricial young tended by both parents.

Niche: A California Species of Special Concern. Much less common now than in the 1940s, primarily because of loss and fragmentation of mature cottonwood and willow stands, especially along the Colorado River (Grinnell and Miller 1944, Remsen 1978).

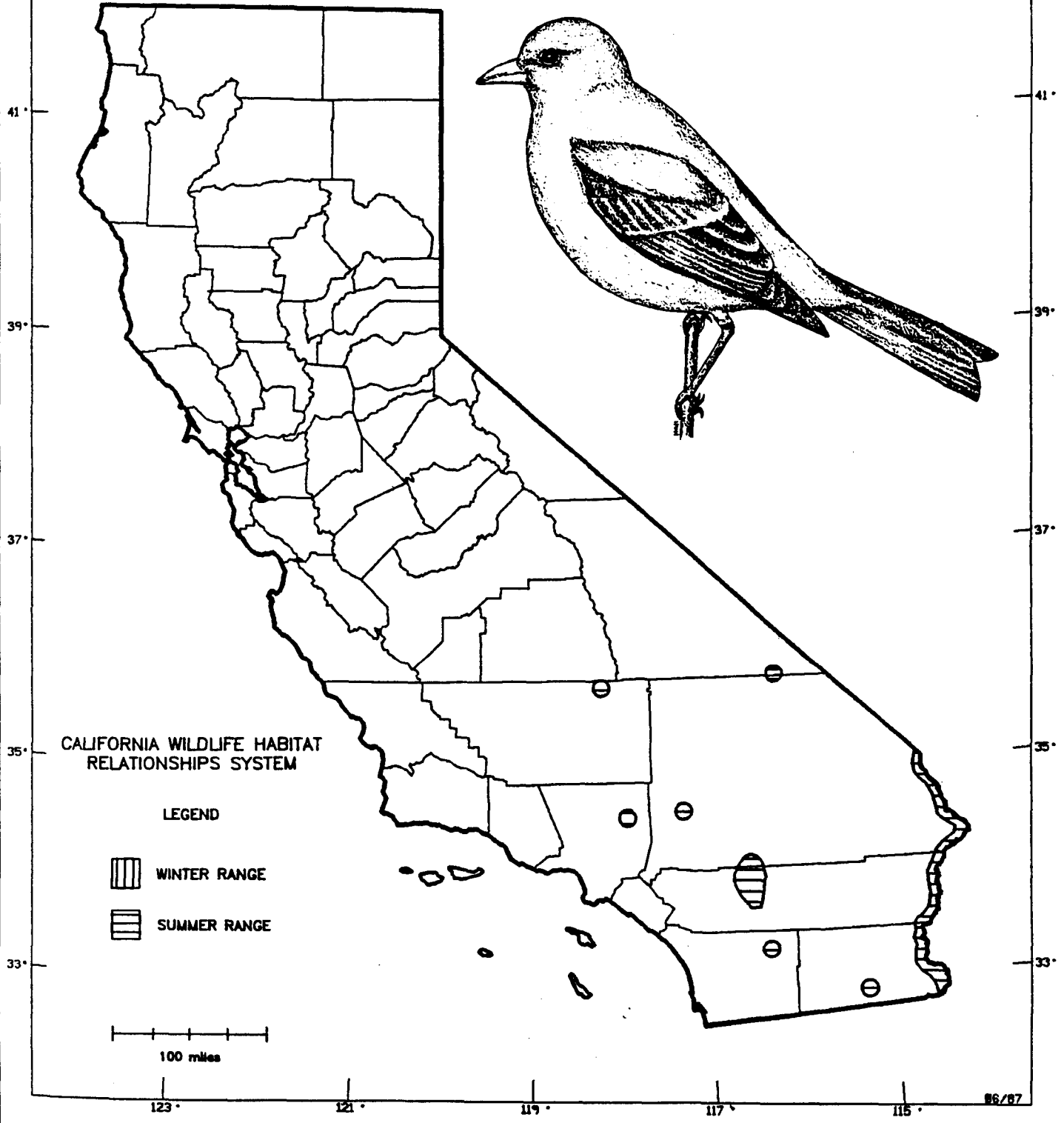
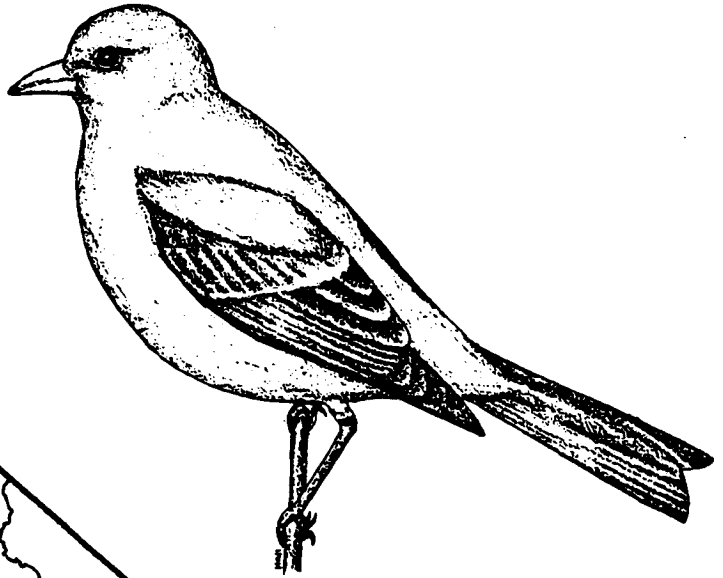
REFERENCES

Grinnell and Miller 1944, Fitch and Fitch 1955, Bent 1958, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, 1988, Terres 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

SUMMER TANAGER

AUTHORSHIP

Species Note Prepared By: D. Dobkin
Species Note Edited By: S. L. Granholm, R. Duke
Species Note Reviewed By: L. R. Mewaldt



86/87

B476 Blue Grosbeak *Guiraca caerulea*

Family: Emberizidae Order: Passeriformes Class: Aves Date: July 21, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon to locally fairly common, summer resident and breeder in Central Valley and lowlands of southern California, occurring in low, dense valley foothill riparian habitat. Often forages in openings and in adjacent croplands and herbaceous habitats. Not limited to riparian habitats postbreeding or in migration. Southern California locations of summer residence include Owens, Imperial, Coachella, and Colorado River valleys, larger desert watercourses and oases, Kern River above Lake Isabella, and coastal lowlands from San Luis Obispo Co. south. Vagrants occur as far north as Shasta and Del Norte cos. Breeding populations in California have declined in recent decades because of habitat degradation and destruction and cowbird parasitism (Grinnell and Miller 1944, Gaines 1974a, McCaskie *et al.* 1979, 1988, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds largely on insects; also eats snails, other invertebrates, seeds, grains, and fruits. Feeds mostly on ground under low, dense vegetation or in nearby openings and fields; also forages in low shrubs and trees.

Cover: Dense, riparian habitats, such as thickets of willow, young cottonwood, nettle, knotweed, arrowweed, or tamarisk, provide cover in breeding season. In migration, finds cover in a variety of other habitats as well.

Reproduction: Builds nest in willow or other low, dense vegetation near water. Nest is a cup of stems, thin twigs, bark strips, lined with fine rootlets, hairs, and grasses. Nest usually 0.15 to 6 m (0.5 to 20 ft), but mostly 0.6 to 3 m (2–10 ft) above ground.

Water: Probably requires drinking water.

Pattern: Breeds in low, dense riparian habitats and forages in adjacent openings, grasslands, and croplands.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Mostly arrives in California in April and departs in August and September for wintering grounds in Mexico and Central America.

Home Range: No data found.

Territory: A breeding territory in South Carolina occupied 6.2 ha (15.3 ac) (Odum and Kuenzler 1955).

Reproduction: Breeding season April to late July, with a peak from early June into early July. Clutch size 2–5 eggs, usually 4. May raise 2 broods yearly in some areas. Incubation 11–12 days, by female alone. Altricial young tended by both parents and leave nest at 9–13 days (Harrison 1978).

Niche: Apparently a common cowbird host. May form postbreeding or migratory flocks (Ehrlich *et al.* 1988).

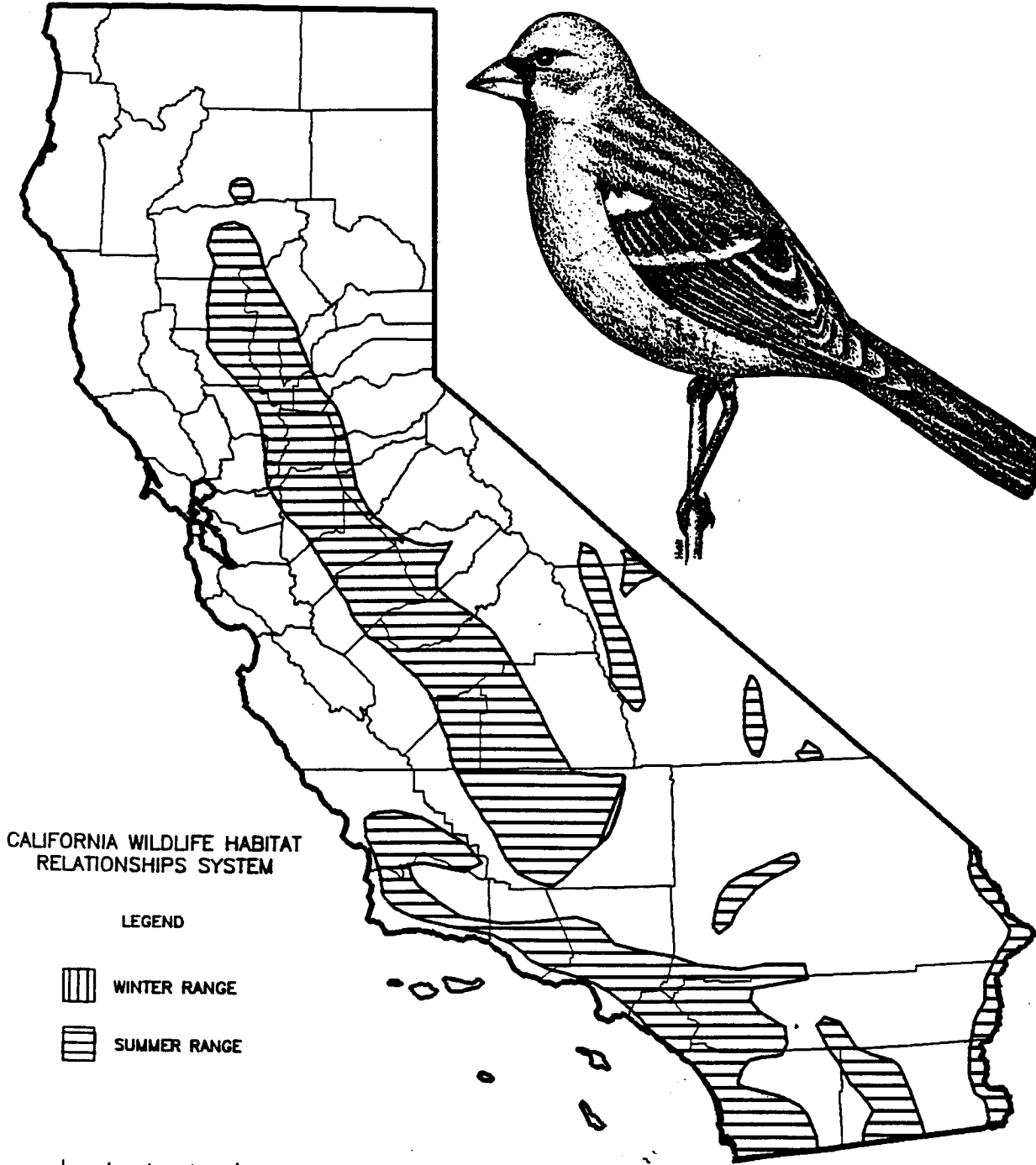
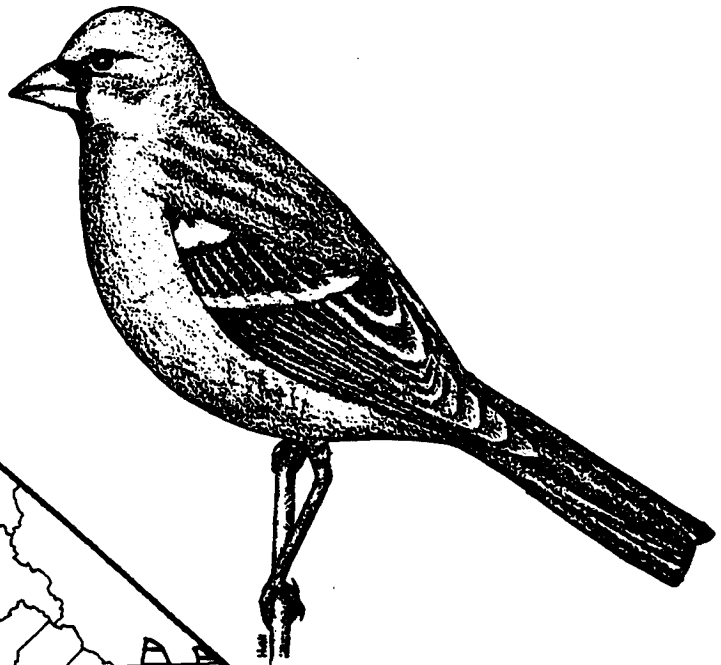
REFERENCES

Grinnell and Miller 1944, Odum and Kuenzler 1955, Bent 1968, Gaines 1974a, Harrison 1978, McCaskie *et al.* 1979, 1988, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

BLUE GROSBEAK

AUTHORSHIP

Species Note Prepared By: D. Dobkin, S. L. Granholm
Species Note Edited By: R. Duke
Species Note Reviewed By: L. R. Mewaldt

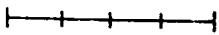


CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

 WINTER RANGE

 SUMMER RANGE

 100 miles

08/87

B501 Grasshopper Sparrow *Ammodramus savannarum*

Family: Emberizidae Order: Passeriformes Class: Aves Date: September 22, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon and local, summer resident and breeder in foothills and lowlands west of the Cascade-Sierra Nevada crest from Mendocino and Trinity cos. south to San Diego Co. Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches. In southern California, occurs mainly on hillsides and mesas in coastal districts, but has bred up to 1500 m (5000 ft) in San Jacinto Mts. Also has been found in Pete's Valley, Lassen Co., and Shasta Valley, Siskiyou Co. Secretive in winter; may occur more regularly than indicated by infrequent records, chiefly in coastal southern California (Grinnell and Miller 1944, McCaskie *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Feeds primarily on insects, especially Orthoptera; also eats other invertebrates and grass and forb seeds. Searches for food on ground and low foliage within relatively dense grasslands; sometimes scratches in litter (Bent 1968).

Cover: Apparently thick cover of grasses and forbs is essential for concealment.

Reproduction: Builds nest of grasses and forbs in a slight depression in ground, hidden at base of an overhanging clump of grasses or forbs.

Water: No data found. Meets water requirement in part from insects in diet.

Pattern: Frequents dense, dry or well-drained grassland, especially native grassland with a mix of grasses and forbs for foraging and nesting. Uses scattered shrubs for singing perches.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Data scarce because very secretive in winter. Apparently winters rarely but regularly in California, chiefly along southern coast. Summer residents arrive March to May, and most migrate south in August or September. Fall migrants recorded in late September and early October on Farallon Islands (DeSante and Ainley 1980).

Home Range: No data found. In Pennsylvania, Smith (1963) found 4-30 pairs per 40 ha (100 ac) over 4 yr. Wing (1949) recorded 4 pairs per 40 ha (100 ac) in Washington. Johnston and Odum (1956) reported 10-35 pairs per 40 ha (100 ac) in Georgia.

Territory: In Wisconsin, Wiens (1969) reported 73 territories averaging 0.8 ha (2.1 ac) and varying from 0.3 to 1.7 ha (0.8 to 4.3 ac). Kendeigh (1941a) reported 6 territories averaging 1.4 ha (3.4 ac) in Iowa. In Pennsylvania, Smith (1963) reported 22 territories averaging 0.8 ha (2.03 ac) and varying from 0.5-1.3 ha (1.2 to 3.3 ac).

Reproduction: Breeds from early April to mid-July, with a peak in May and June. Pair apparently nests solitarily. Clutch size usually 4 or 5 eggs, sometimes 3 or 6. May raise 2 or 3 broods per yr. Incubation 11-12 days, by female alone. Altricial young tended by female; male reacts to predators near nest. Young leave nest at about 9 days, although still unable to fly (Harrison 1978).

Niche: May form semicolonial breeding groups of 3-12 pairs, but apparently does not form flocks in winter. Abundance fluctuates markedly locally and from year to year (Ehrlich *et al.* 1988).

REFERENCES

Kendeigh 1941a, Grinnell and Miller 1944, Wing 1949, Johnston and Odum 1956, Smith 1963, Bent 1968, Wiens 1969, 1973, Harrison 1978, McCaskie *et al.* 1979, DeSante and Ainley 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

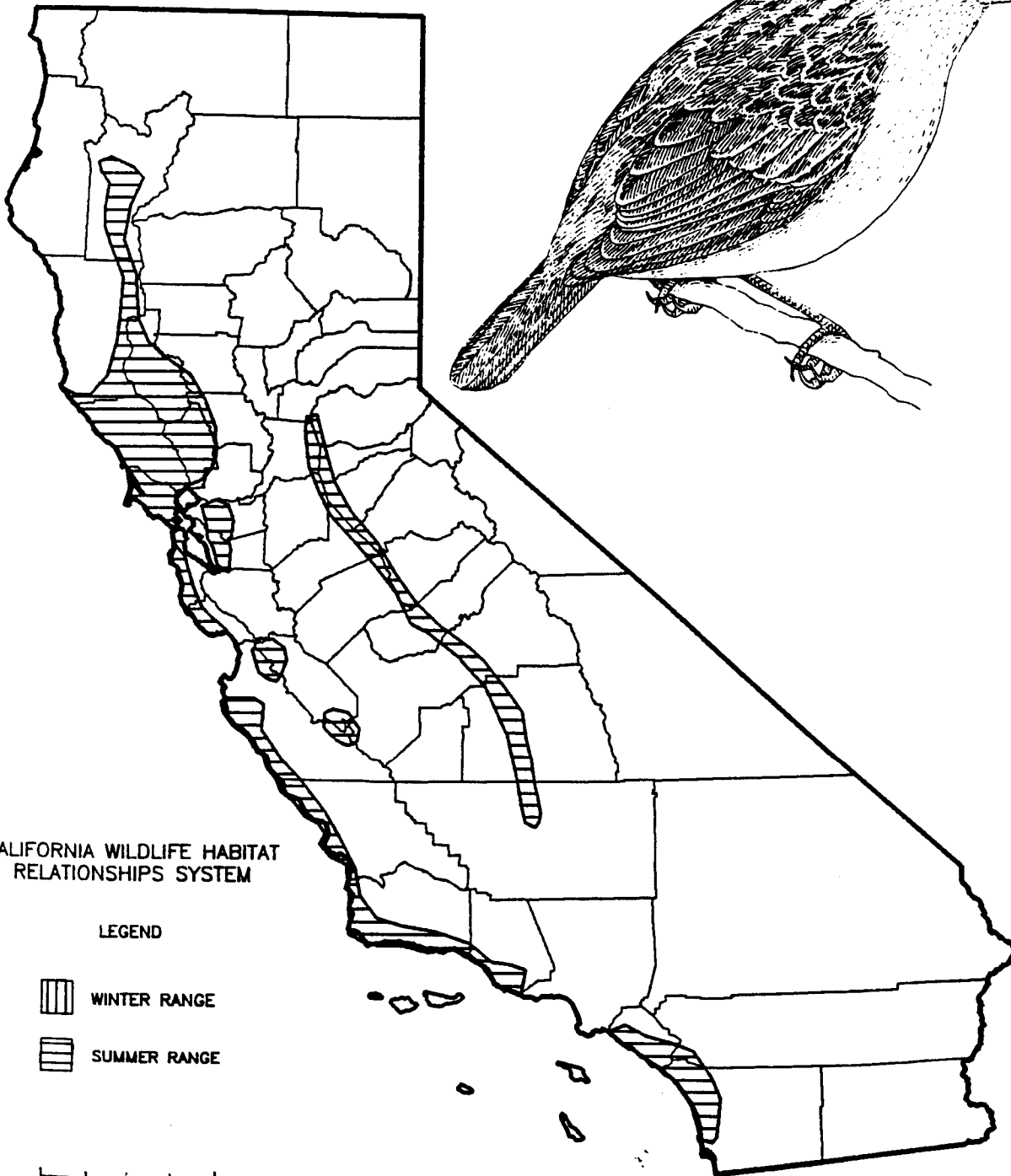
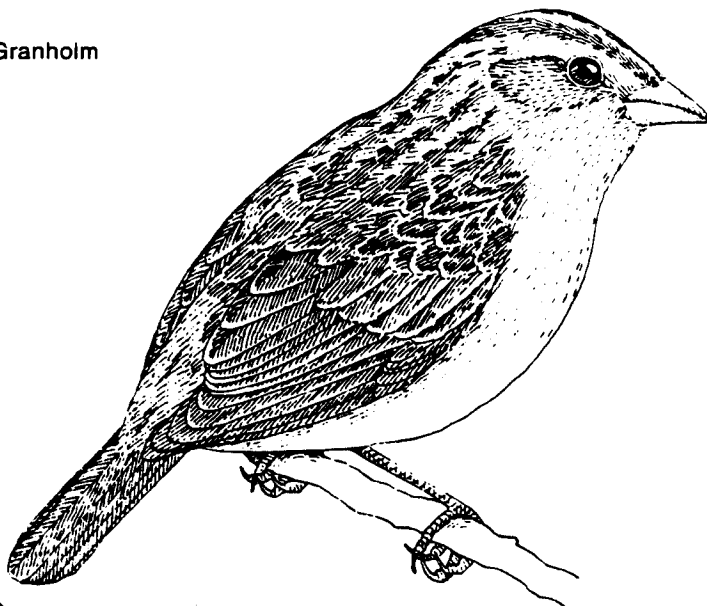
GRASSHOPPER SPARROW

AUTHORSHIP

Species Note Prepared By: D. Dobkin, S. L. Granholm

Species Note Edited By: R. Duke

Species Note Reviewed By: L. R. Mewaldt

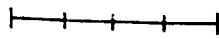


CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

 WINTER RANGE

 SUMMER RANGE


100 miles

B522 Yellow-headed Blackbird *Xanthocephalus xanthocephalus*

Family: Emberizidae Order: Passeriformes Class: Aves Date: December 20, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Breeds commonly, but locally, east of Cascade Range and Sierra Nevada, in Imperial and Colorado River valleys, and fairly commonly in Central Valley. Nests in fresh emergent wetland with dense vegetation and deep water, often along borders of lakes or ponds. Forages in emergent wetland and moist, open areas, especially cropland and muddy shores of lacustrine habitat. Uncommon in Central Valley in winter, occurring mainly in southern portion. Fairly common in winter in Imperial Valley; rare and irregular elsewhere, including coastal areas. Occurs as a migrant and local breeder in deserts and along coast of southern California. Has bred, at least irregularly, as high as 2000 m (6600 ft) in San Bernardino Mts. (Grinnell and Miller 1944, McCaskie *et al.* 1979, Garrett and Dunn 1981).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Adult feeds primarily on seeds and cultivated grains; eats insects in breeding season. In Sacramento Valley, insect consumption reached a peak of 20% in summer (Crane and DeHaven 1978). Young fed mostly insects, some spiders and snails (Willson 1966). Feeds in emergent vegetation, along moist shorelines, and in nearby grasslands and croplands, preferably near water or on moist ground. Often hawks flying insects (Bent 1958).

Cover: Dense emergent vegetation used for nesting, roosting, for cover during postbreeding molt, and other cover needs (Bent 1958).

Reproduction: Nesting colony located in dense emergent wetland of cattails, tules, other plants, often along border of lake or pond. Breeds only where large insects such as Odonata are abundant; nesting timed to coincide with maximum emergence of aquatic insects (Willson and Orians 1963). Nest placed in emergent vegetation (rarely willows), usually 0.2 to 0.9 m (0.5 to 3 ft) above water surface; typically near edge of emergent vegetation farthest from shore, above water 0.6 to 1.3 m (2-4 ft) deep (Bent 1958). Large wetlands preferred.

Water: Nest and roost always located over water, and most foraging takes place over water, near water, or on moist ground. Drinking water probably required, at least when seeds and grains are major foods.

Pattern: Nests, roosts, and does much foraging in fresh emergent wetland. Also feeds along shorelines and in nearby open fields, preferably on moist ground. Foraging ground may be as far as 1.6 km (1 mi) from nesting colony (Willson 1966), and probably considerably farther from winter roost.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Much of California breeding population migrates south to winter. Uncommon as a winter resident in Central Valley, occurring mostly in southern portion; fairly common in Imperial Valley. Elsewhere, including coastal areas, rare and irregular in winter. Migrants occur outside breeding range in April, early May, and September, particularly in southern California deserts and coastal areas.

Home Range: Breeders in eastern Washington foraged up to 1.6 km (1 mi) from nesting territory (Willson 1966).

Territory: In scattered cattails in Imperial Co., Willson (1966) reported 24 territories averaging 116 m² (1250 ft²), and 75 territories varying from 37-46 m² (400-500 ft²). In eastern Washington, she found territories much larger, varying from an average of 455 m² (4900 ft²) for 13 territories in bulrush to 2800 m² (30,000 ft²) for 7 territories in scattered cattails. In Utah, 11 territories averaged 0.012 ha (0.03 ac) (Fautin 1940).

Reproduction: Breeding season lasts from mid-April to late July. Polygynous; each male may have 2-5 mates nesting on his territory (Willson 1966). Usually nests in a large colony with nests fairly closely spaced. Average clutch 4 eggs (range 2-5). Mostly raises a single brood per yr (Willson and Orians 1963). Incubation lasts 10-13 days. Altricial young tended by female or by both parents; leave nest at about 9-12 days, but do not fly until about 20 days. Probably breeds first at 1 yr (Harrison 1978).

Niche: Adults aggressively attack hawks, crows, and other large birds near territory. Probably the most important predators on eggs and young are mink, great horned owl, northern harrier, red fox, and muskrat (Bent 1958). Storms and changes in water level can be very destructive. Brood parasitism by brown-headed cowbird occurs occasionally (Friedmann 1963). Males may form flocks postbreeding, separate from females and young. May join very large mixed flocks in winter with other blackbirds, cowbirds, grackles (Ehrlich *et al.* 1988).

REFERENCES

Fautin 1940, Grinnell and Miller 1944, Bent 1958, Friedmann 1963, Willson and Orians 1963, Willson 1966, Miller 1968, Orians and Horn 1969, Crane and DeHaven 1972, 1978, Harrison 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

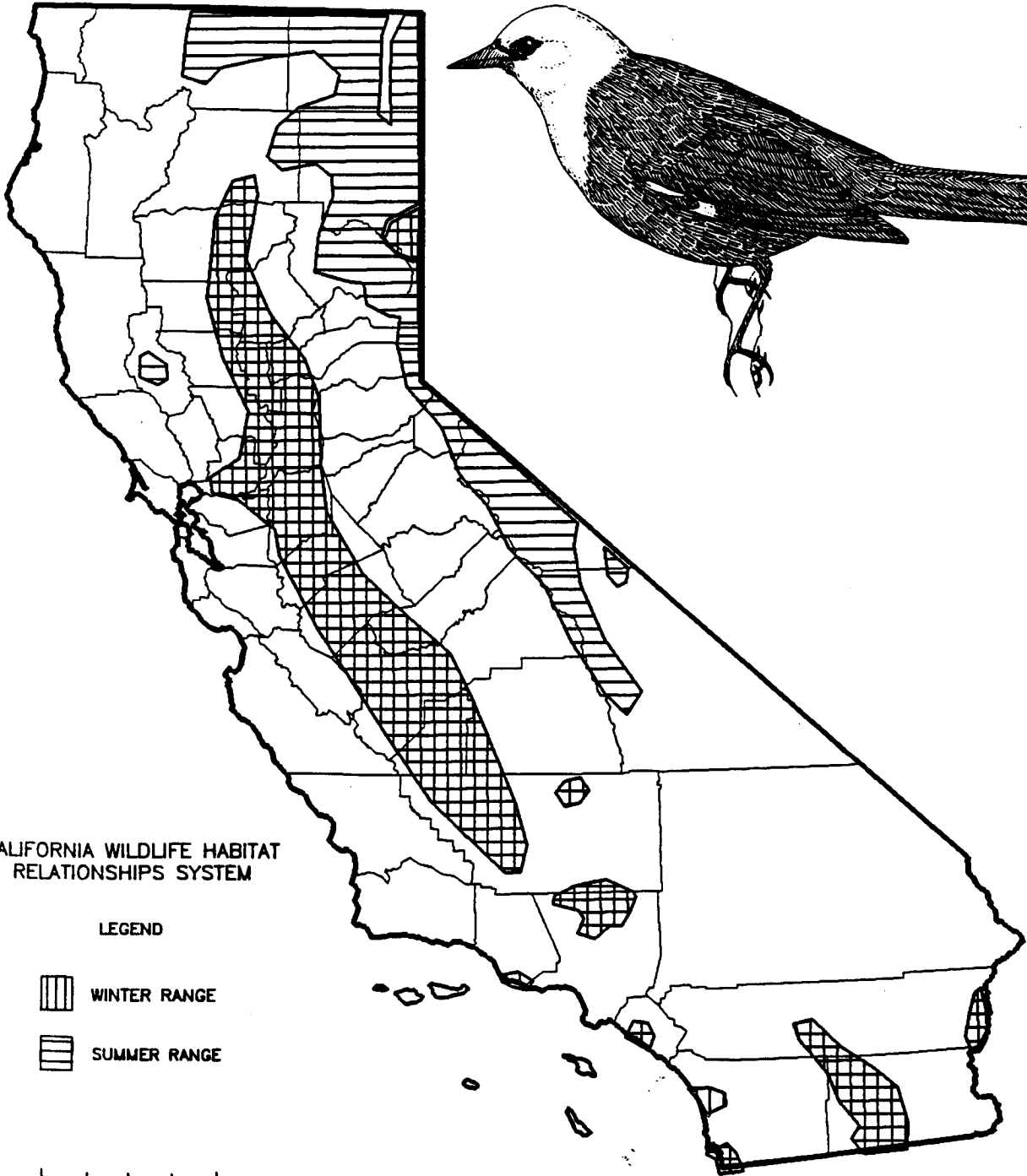
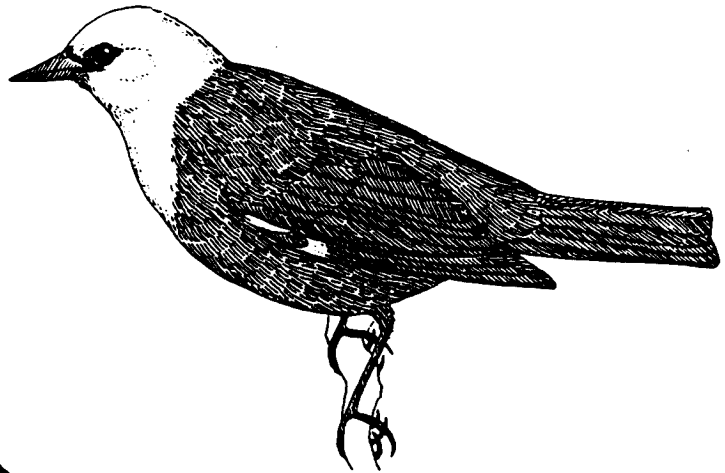
YELLOW-HEADED BLACKBIRD

AUTHORSHIP

Species Note Prepared By: S. L. Granholm

Species Note Edited By: R. Duke

Species Note Reviewed By: L. R. Mewaldt

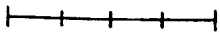


CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

 WINTER RANGE

 SUMMER RANGE


100 miles

06/87

A001 Tiger Salamander *Ambystoma tigrinum*

Family: Ambystomatidae Order: Caudata Class: Amphibia Date: November 29, 19

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

In California, the tiger salamander is most commonly found in annual grass habitat, but also occurs in grassy understory of valley-foothill hardwood habitats, and uncommonly along streamcourses. Its range includes the Central Valley from Yolo Co. south to Kern Co., and coastal grasslands from the vicinity of San Francisco Bay south at least to Santa Barbara Co. One isolated population is known to exist at Grass Lake in Siskiyou Co. In California, most populations occur at elevations of less than 305 m (1000 ft), but they have been recorded up to 1370 m (4500 ft).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Postmetamorphic juveniles and adults appear to be "sit and wait" predators (Lindquist and Bachmann 1980) taking earthworms, snails, insects, fish, and even small mammals (Stebbins 1972). Aquatic larvae feed on littoral, benthic, and planktonic arthropods. Small larvae (less than 2 cm) eat almost exclusively zooplankton, while larger individuals consume zooplankton, amphipods, mollusks, and insect larvae (Dodson and Dodson 1971).

Cover: Adults spend most of the year in subterranean refugia, especially ground squirrel burrows and occasionally man-made structures. During breeding migrations individuals are sometimes found under surface objects such as rocks and logs. Postmetamorphic juveniles retreat to mammal burrows after spending a few hours or days in mud cracks near water, or tunnels constructed in soft soil. Aquatic larvae seek cover in turbid water, clumps of vegetation and other submerged debris.

Reproduction: Tiger salamanders breed and lay eggs primarily in vernal pools and other temporary ponds. They sometimes use permanent human-made ponds if predatory fishes are absent. Streams are rarely used for reproduction.

Water: Rainfall is important to the formation and maintenance of breeding ponds. Most surface migrations and other movements by adults are associated with sustained rainfall, especially at night. In some localities, dispersal of postmetamorphic juveniles from breeding ponds is not associated with rainfall. In such cases, desiccation can cause significant mortality. Apparently desiccating individuals aggregate to reduce water loss (Alvarado 1967). This species also conserves water by tolerating high blood urea concentrations (Romspert and McClanahan 1981).

Pattern: Prime habitat in California is annual grass, but seasonal ponds, or vernal pools are crucial to breeding. Permanent ponds or reservoirs sometimes used as well.

SPECIES LIFE HISTORY

Activity Patterns: Adults exist in subterranean most of the year. Before and after breeding, they at night during rains. During breeding, some activity occurs. In late spring or early postmetamorphic juveniles disperse from breeding night.

Seasonal Movements/Migration: In California, rains of November usually initiate adult migration to breeding ponds. They usually stay at the ponds several days, but some individuals may remain up to several weeks after breeding is completed. Larvae migrate during late spring or early summer, usually by the first week of July in central California. They disperse from breeding sites after spending a few hours or days near pond margins.

Home Range: Few movements occur during the year. Migrations to and from breeding ponds occasionally exceed 1000 m (3300 ft).

Territory: Not territorial.

Reproduction: Breeding and egg-laying occur from December through early February. Females lay numerous small clusters of eggs, each containing from 50 to over 100 eggs (Stebbins 1972). Individual females lay well over 1000 eggs. Eggs are deposited on submerged and emergent vegetation and on submerged debris.

Niche: Larvae may compete with or prey upon other amphibian larvae. Ponds with large populations of *tigrinum* larvae usually contain very few larvae of other amphibian species. Adults are probably not subject to heavy predation by other species due to their secretive behaviors and the brief period of activity at breeding ponds. Long (1964) reported a single adult tiger salamander in the stomach contents of a badger. Large numbers of aquatic larvae are taken by wading birds, particularly herons and egrets. Sometimes garter snakes also prey on larvae.

General Comments: Introduced fishes in breeding ponds can reduce the survival of tiger salamander larvae. Even temporary fish introductions are detrimental. Tiger salamander populations can be eliminated within a few years. Aquatic larvae imported from other states and transported by fishermen for bait. Therefore, any locality records should be viewed with caution.

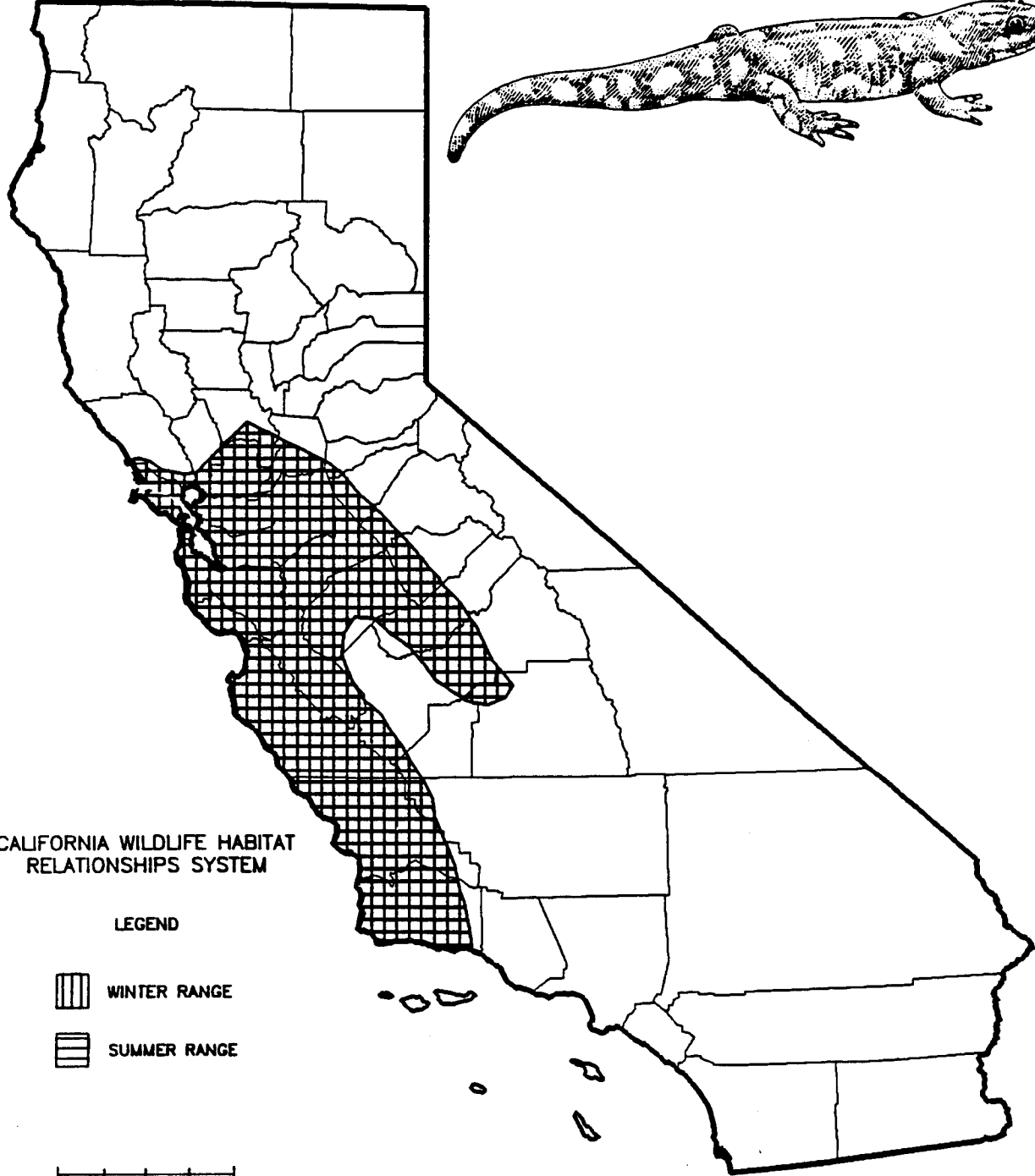
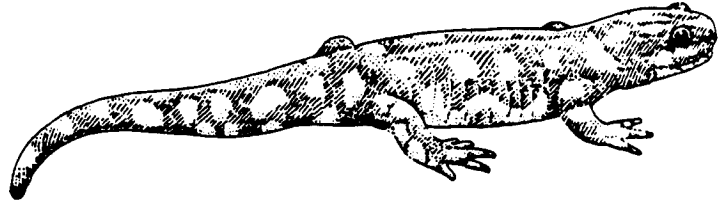
REFERENCES

Stebbins 1951, 1972, Long 1964, Alvarado 1967, Gehlbach 1967, Dodson and Dodson 1971, Lindquist and Bachmann 1980, Romspert and McClanahan 1981.

TIGER SALAMANDER

AUTHORSHIP

Species Note Prepared By: S. Morey
Species Note Edited By: R. Duke, E. C. Beedy
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

A017 Kern Canyon Slender Salamander *Batrachoseps simatus*

Family: Plethodontidae Order: Caudata Class: Amphibia Management
Status: California Threatened, Forest Service Sensitive. Date: July 22, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

This species is uncommon, and is known only from the lower Kern River Canyon in Tulare and Kern cos. Elevation 305 to 1220 m (1000 to 4000 ft). Prefers valley-foothill hardwood, valley-foothill hardwood-conifer, and mixed chaparral habitats.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Forages under or close to surface of objects such as pieces of bark, decaying logs, and flat talus rocks or moist leaf litter, and may enter termite tunnels and earthworm burrows. Related species take small arthropods such as spiders and mites, insects (especially collembolans, coleopterans, and hymenopterans), earthworms and snails (Cunningham 1960, Adams 1968).

Cover: During the moist periods of fall, winter, and spring precipitation, individuals seek cover under surface objects such as logs, boards, moist leaf litter, and rock talus. This species retreats to moist underground niches or seepage areas during drier periods.

Reproduction: Little information on specific habitat requirements for breeding or egg laying. Eggs of similar species are laid underground or on moist substrates under or within surface objects, especially pieces of bark (Stebbins 1972).

Water: No information on water requirements but surface activity is strongly correlated with periods of fall, winter, and spring precipitation.

Pattern: Prefers north-facing slopes in valley-foothill hardwood, valley-foothill hardwood-conifer, and mixed chaparral habitats.

SPECIES LIFE HISTORY

Activity Patterns: Nocturnal surface activity during moist periods (November to May). Retreats underground during dry periods.

Seasonal Movements/Migration: Retreats to subterranean refugia during dry periods.

Home Range: No information; probably small. Area of surface activity probably covers, or is proximal to, area of underground activity.

Territory: Unknown. Individuals have not been observed to actively defend resources, but females of related species are commonly found in the vicinity of egg clusters.

Reproduction: Probably lays eggs during the latter period of winter and early spring. Related forms lay eggs in clusters of 4 to 21 (Stebbins 1954 and references therein).

Niche: A semifossorial species able to enter termite tunnels, earthworm burrows, and other small openings not available to more robust salamanders. Another slender salamander (*Batrachoseps pacificus relictus*) occurs in the same area but is more restricted to stream beds and seepages. May compete for food resources with juvenile salamanders of other species where their ranges overlap. Primary predators are probably small snakes such as the ringneck snake. Adults and juveniles may also be taken by beetle larvae and other predatory arthropods, diurnal birds (especially those that search through leaf litter) and small mammals.

General Comments: This species is not common within its restricted range. Road construction or other human activities within the vicinity of known probable habitat should be designed to minimize impact.

REFERENCES

Stebbins 1954, 1972, Cunningham 1960, Adams 1968, Brame and Murray 1968, Leach *et al.* 1976.

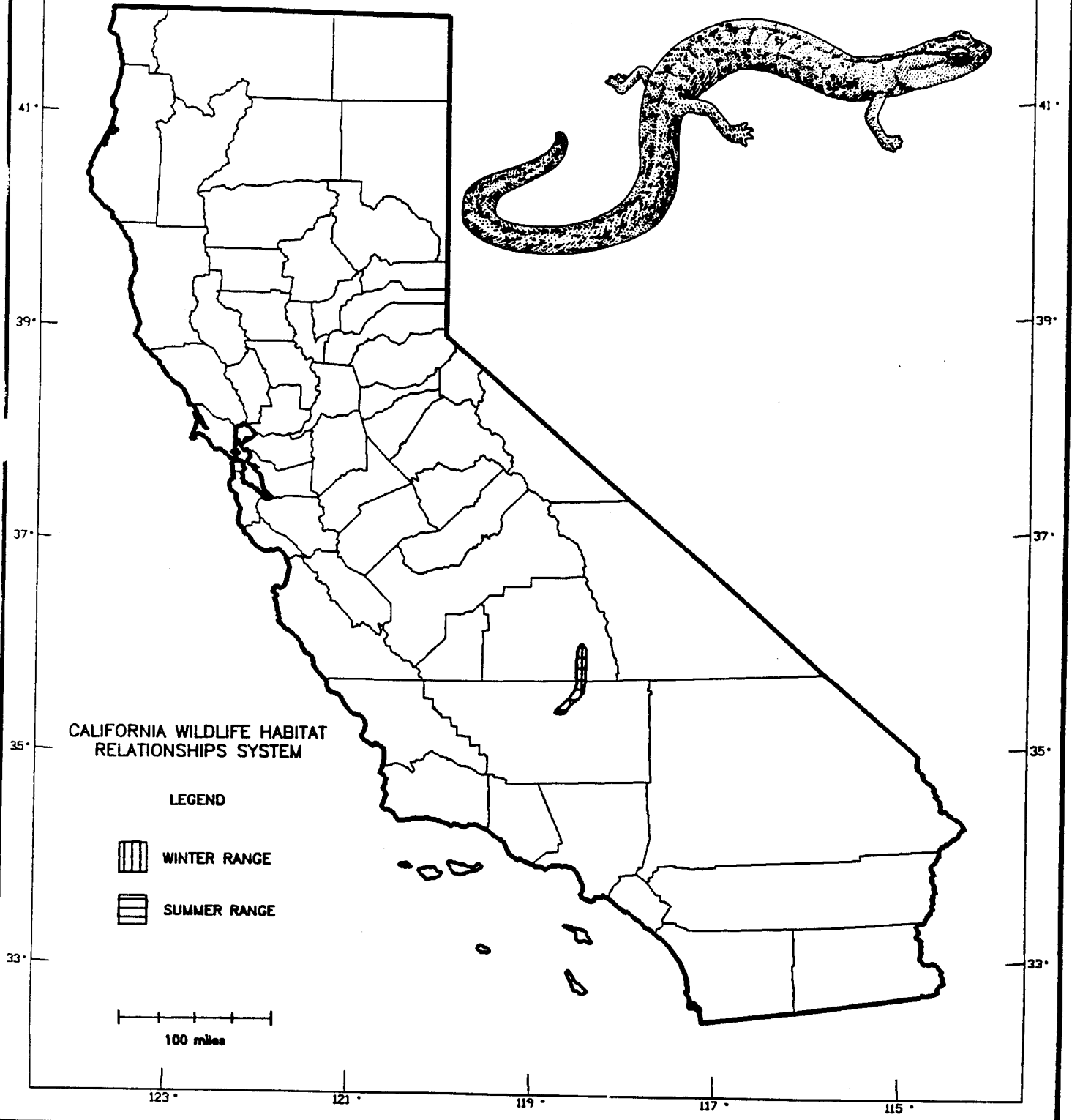
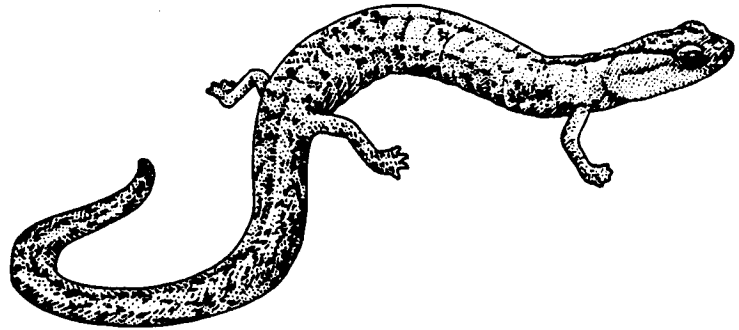
KERN CANYON SLENDER SALAMANDER

AUTHORSHIP

Species Note Prepared By: S. Morey, H. Basey

Species Note Edited By: R. Duke

Species Note Reviewed By: T. Papenfuss



A018 Tehachapi Slender Salamander *Batrachoseps stebbinsi*

Family: Plethodontidae Order: Caudata Class: Amphibia Management Status: Califo
Threatened, Forest Service Sensitive. Date: November 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

This species is uncommon in suitable habitat in a small number of isolated localities in the Piute and Tehachapi Mts. of Kern Co., and perhaps in Los Angeles and Ventura cos. Elevation 760 to 1500 m (2500 to 5000 ft). Preferred habitats include valley-foothill hardwood-conifer and valley-foothill riparian.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Forages primarily under surface objects such as pieces of bark or flat talus rocks in moist areas or in leaf litter, and may enter termite tunnels and earthworm burrows. Little information on food habits, but related species take small arthropods such as spiders and mites, insects (especially collembolans, coleopterans, and hymenopterans), earthworms, and snails (Cunningham 1960, Adams 1968).

Cover: During the moist periods of fall, winter, and spring precipitation, individuals seek cover under surface objects, especially rock talus (Brame and Murray 1968). This species retreats to moist underground niches or seepage areas during drier periods.

Reproduction: Little information on specific habitat requirements for breeding or egg laying. Eggs of similar species are laid underground or on moist substrates underneath or within surface objects, especially pieces of bark (Stebbins 1972).

Water: No information on water requirements, but surface activity is strongly correlated with periods of fall, winter and spring precipitation.

Pattern: This species appears to prefer north-facing talus slopes in valley-foothill hardwood-conifer and valley-foothill riparian habitats.

SPECIES LIFE HISTORY

Activity Patterns: Nocturnal surface activity c moist periods (November to May). Retreats u ground or to moist seepages during drier period

Seasonal Movements/Migration: Retreats to terranean refugia during dry periods.

Home Range: No information; probably small. of surface activity probably covers, or is proximal t area of underground activity.

Territory: Unknown. Individuals have not observed to actively defend resources, but femal related species are commonly found in the imme vicinity of egg clusters.

Reproduction: Probably lays eggs during the periods of winter and early spring. Related form eggs in clusters of 4 to 21 (Stebbins 1954 references therein).

Niche: A semifossorial species able to enter te tunnels, earthworm burrows and other small oper not available to other more robust salamanders. compete for food resources with juvenile salamar of other species where their ranges overlap. Pri predators are probably small snakes such as ringneck snake. Adults and juveniles may also be t by beetle larvae and other predatory arthropods, dii birds (especially those that search through leaf and small mammals.

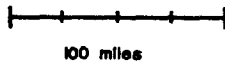
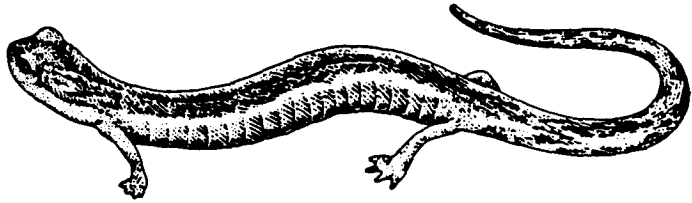
REFERENCES

Stebbins 1954, 1972, Cunningham 1960, Ac 1968, Brame and Murray 1968, Leach *et al.* 1976

TEHACHAPI SLENDER SALAMANDER



AUTHORSHIP

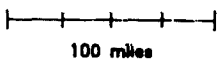
Species Note Prepared By: S. Morey
Species Note Edited By: J. Harris, R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE



01/88

A040 Red-legged Frog *Rana aurora*

Family: Ranidae Order: Anura Class: Amphibia Management Status: California
Protected Amphibian Date: November 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The red-legged frog inhabits quiet pools of streams, marshes, and occasionally ponds. Occurs west of the Sierra-Cascade crest and along the Coast Ranges the entire length of the state (Stebbins 1985), usually below 1200 m (3936 ft). Uncommon in Sierra-Cascade portion of range, uncommon to common elsewhere.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Adults take aquatic and terrestrial insects and crustaceans and snails (Stebbins 1951), as well as worms, fish, tadpoles and smaller frogs (Dickerson 1906). Aquatic larvae are mostly herbivorous.

Cover: Highly aquatic. Prefers shorelines with extensive vegetation. Usually escapes to water 1 m (3 ft) deep or more, at the bottom of pools.

Reproduction: Eggs are deposited in permanent pools attached to emergent vegetation (Stebbins 1954).

Water: Requires permanent or nearly permanent pools for larval development, which takes 11 to 20 weeks (Storer 1925, Calef 1973). May require rains for dispersal. Individuals have been found considerable distances from breeding sites on rainy nights.

Pattern: Occurs in the vicinity of quiet, permanent pools of streams, marshes, and occasionally ponds.

SPECIES LIFE HISTORY

Activity Patterns: Active all year coastally, but with periods of inactivity (late summer to early winter) elsewhere.

Seasonal Movements/Migration: A highly aquatic species with little movement away from streamside habitats. Individuals are occasionally found on roads at night during winter and spring rains. The nature of these movements is unknown.

Home Range: Unknown; possibly large for dispersing juveniles but probably smaller for adults.

Territory: Males probably defend a space for sexual display during the breeding season, as in other ranids (Martof 1953, Emlen 1968).

Reproduction: Breeds January to July (peak in February) in the south, and March to July in the north. Females lay 750 to 4000 eggs in clusters up to 10 in across, attached to vegetation 7 to 15 cm (2 to 6 in) below the surface (Stebbins 1954). Tadpoles require 11 to 20 weeks to reach metamorphosis (Stebbins 1951, Calef 1973).

Niche: Probably subject to predation by aquatic invertebrates and vertebrates such as fishes, other amphibians, snakes, and occasionally birds and mammals, during all life history stages.

General Comments: Sierra populations are highly restricted and consist of small numbers of individuals. Human activities that result in habitat destruction and/or the introduction of exotic competitors such as bullfrogs and green sunfish may have a negative effect on these few existing Sierra populations (Moyle 1973).

REFERENCES

Dickerson 1906, Storer 1925, Stebbins 1951, 1954, 1985, Martof 1953, Emlen 1968, Calef 1973, Moyle 1973.

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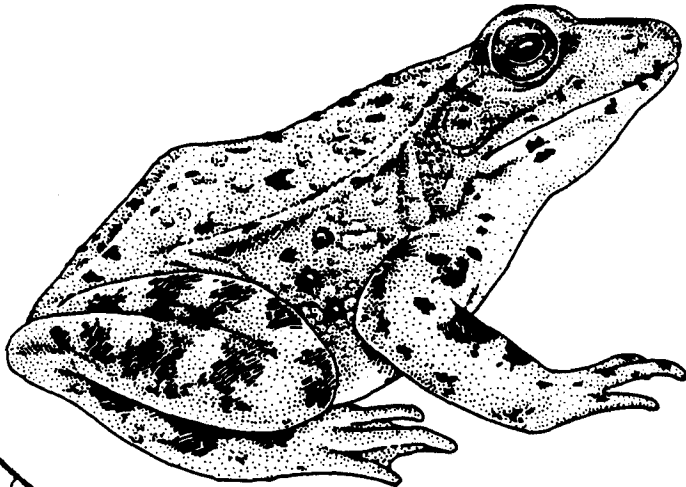
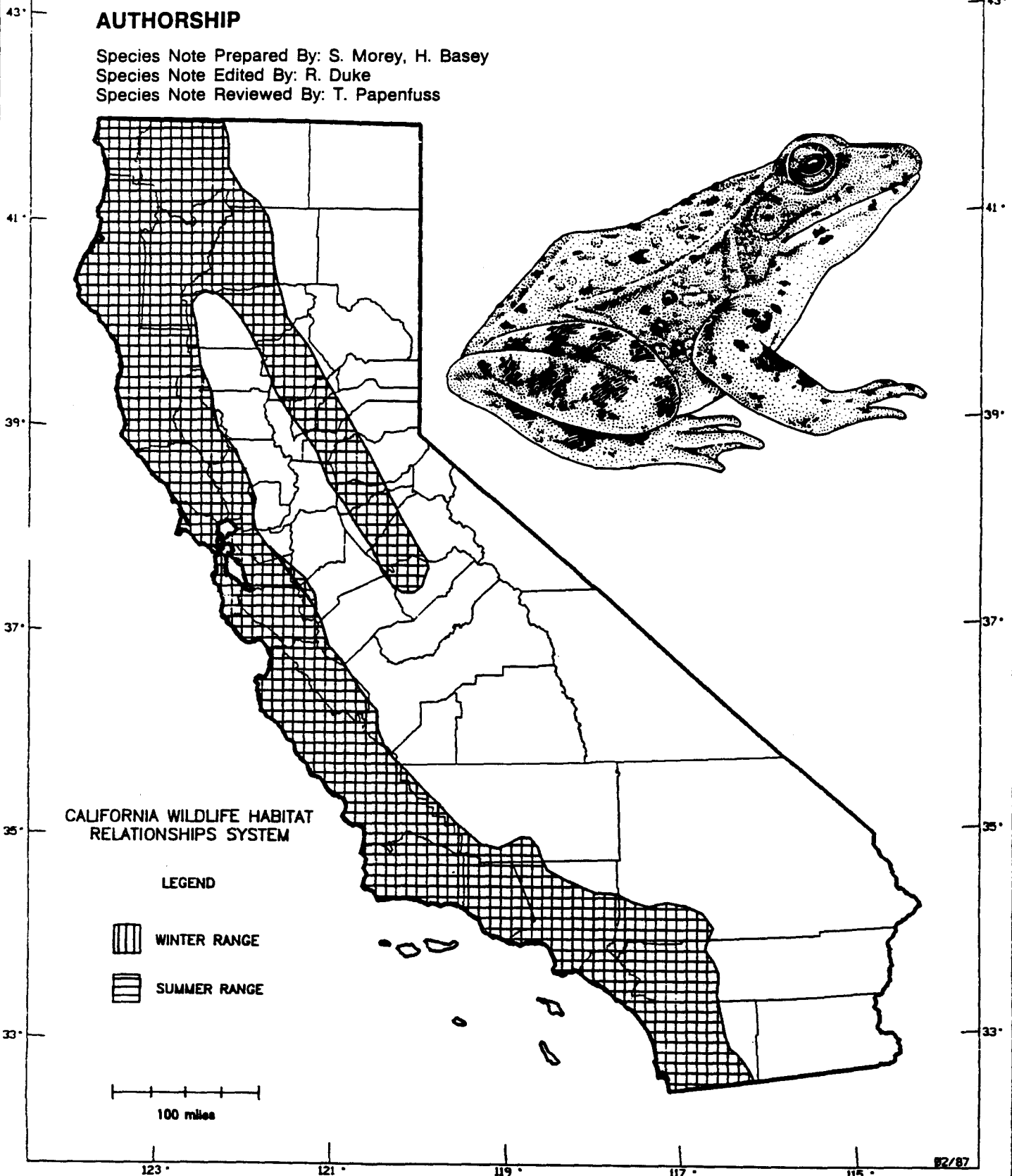
RED-LEGGED FROG

AUTHORSHIP

Species Note Prepared By: S. Morey, H. Basey

Species Note Edited By: R. Duke

Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM

LEGEND

WINTER RANGE

SUMMER RANGE

100 miles

123° 121° 119° 117° 115°

82/87

R043 California Legless Lizard *Anniella pulchra*

Family: Anniellidae Order: Squamata Class: Reptilia Date: January 18, 1985

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

This secretive fossorial lizard is common in suitable habitats in the Coast Ranges from the vicinity of Antioch, Contra Costa Co. south to the Mexican border. Legless lizards are of spotty occurrence throughout the rest of their range, which includes the floor of the San Joaquin Valley from San Joaquin Co. south, the west slope of the southern Sierra, the Tehachapi Mountains west of the desert, and the mountains of southern California. An isolated desert population is known from Whitewater, Riverside Co. Elevation sea level to over 1830 m (6000 ft) in the Sierra. Common in several habitats but especially in coastal dune, valley-foothill, chaparral, and coastal scrub types.

SPECIFIC HABITAT REQUIREMENTS

Feeding: This lizard usually forages at the base of shrubs or other vegetation either on the surface or just below it in leaf litter or sandy soil. Legless lizards eat insect larvae, small adult insects, and spiders (Stebbins 1954).

Cover: Legless lizards sometimes seek cover under surface objects such as flat boards and rocks where they lie barely covered in loose soil. They are often encountered buried in leaf litter and commonly burrow near the surface through loose soil.

Reproduction: Little is known about specific habitat requirements for courtship and breeding. Live young are born in the fall.

Water: Little information on water requirements. Legless lizards are often found where substrates are slightly moist. Miller (1944) reported that moisture is an essential habitat requirement.

Pattern: Found primarily in areas with sandy or loose organic soils or where there is plenty of leaf litter.

SPECIES LIFE HISTORY

Activity Patterns: Legless lizards have a relatively low thermal preference (Bury and Balgooyen 1976) which allows them to be active on cool days as well as early in the morning and even at night during warm periods, at which time mid-day activity is reduced. Individuals from coastal and southern localities are probably active all year with only brief periods of winter inactivity. Lizards from more inland sites, especially the Sierra foothills, undergo winter hibernation.

Seasonal Movements/Migration: Predictable seasonal movements have not been reported for this species in California. Presumably all habitat requirements are met within the normal area of activity.

Home Range: No data, but likely quite restricted. Some long distance wandering related to temporary available food resources may occur.

Territory: No evidence for the territorial defense of resources has been reported.

Reproduction: The reproductive season begins with mating activities in late spring or early summer. Live young are born in September, October, or even November. Litter size ranges from one to four but twos is common (Stebbins 1954).

Niche: This secretive and little known lizard may occasionally be taken as prey by alligator lizard, snakes, birds, and small mammals. Competition for food, space, or other resources with most lizards with which it coexists is probably minimal because of its low thermal tolerances and preference for moist substrates exhibited by legless lizards. The diet of legless lizards probably overlaps to some extent with that of juvenile alligator lizards, skinks, and perhaps some salamanders.

Comments: The status of the black legless lizard (*A. p. nigra*) is under review by the U.S. Fish and Wildlife Service. Recent arguments have suggested a specific change to *Anniella nigra* (Hunt 1983).

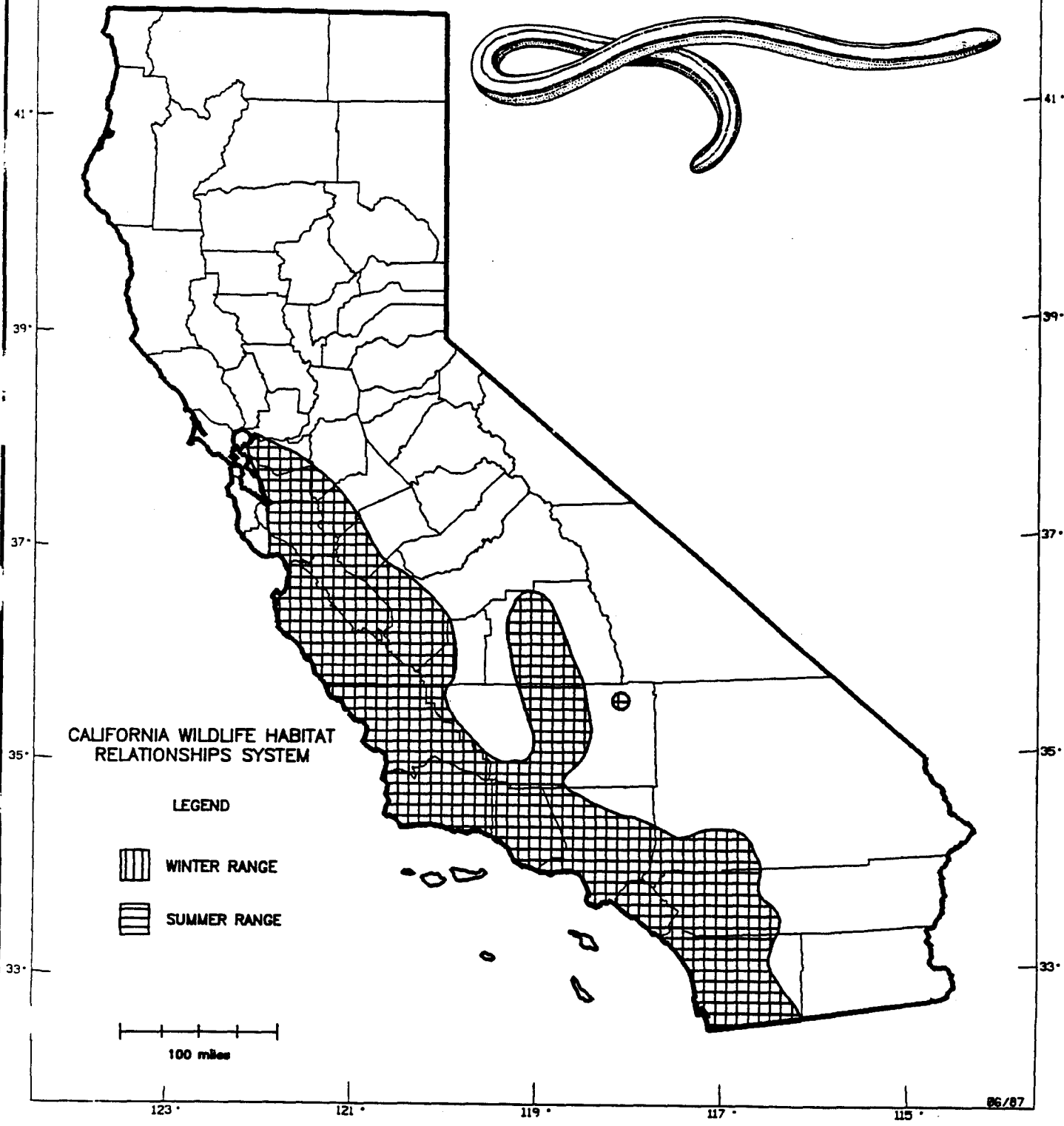
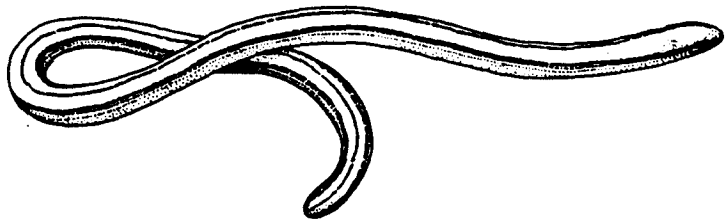
REFERENCES

Miller 1944, Stebbins 1954, Bury and Balgooyen 1976, Hunt 1983.

CALIFORNIA LEGLESS LIZARD

AUTHORSHIP

Species Note Prepared By: S. Morey
Species Note Edited By: R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

06/87

R046 Rubber Boa *Charina bottae*

Family: Boidae Order: Squamata Class: Reptilia Management Status: *C. b. umbratica*, California Threatened, U.S. Forest Service Sensitive. Date: November 30, 1983

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The rubber boa is uncommon to common in suitable habitats. Occurs from the southern Sierra, possibly as far south as Kern Co., north throughout the Sierra, across the northern part of the state and in the Coast Ranges south nearly to Point Conception. Found from sea level to 2740 m (9040 ft). Found in a variety of montane forest habitats including red fir, ponderosa pine, hardwood, hardwood-conifer, Douglas-fir, redwood, mixed conifer and riparian. Also found in montane chaparral and wet meadow habitats. Usually found in the vicinity of streams or wet meadows. A geographically isolated race, *C. b. umbratica*, appears to be extremely uncommon and is apparently restricted to the San Bernardino and San Jacinto Mts. (Erwin 1974).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Food consists primarily of small mammals and lizards (Stebbins 1954). May occasionally take smaller snakes (Linder 1963) and *Ensatina* (Macey 1983).

Cover: The rubber boa is an extremely secretive snake seeking cover in rotting logs, pieces of bark, boards, rocks, and other surface debris. Burrows through loose soil or decaying vegetation. Occasionally climbs.

Reproduction: Young are born in loose, well-aerated soil, under surface objects, or within rotting logs.

Water: No additional information on water requirements.

Pattern: Usually found in the vicinity of streams or wet meadows or within or under surface objects with good moisture-retaining properties such as rotting logs.

SPECIES LIFE HISTORY

Activity Patterns: Mainly crepuscular during warmer periods of spring, summer, and fall but some nocturnal and diurnal activity. Inactive during cooler periods.

Seasonal Movements/Migration: No information. Probably little seasonal movement but may migrate short distances to and from suitable hibernacula at higher elevations.

Home Range: No information.

Territory: Has not been observed to aggressively defend resources in the wild.

Reproduction: Breeding occurs from April to June. Young are born alive from late summer (Erwin 1964) to late November (Hudson 1957). Number of young 2 to 8 (Stebbins 1972).

Niche: Because of its secretive behavior this snake is probably not subject to heavy predation. Adults and young may occasionally be taken by hawks and owls or by predatory mammals such as skunks and raccoons. Potentially competes for food resources with the California mountain kingsnake where their ranges overlap.

General Comments: The threatened subspecies *C. b. umbratica* is known only from a few individuals from a very small number of localities. This race is threatened by development and increased recreational use in forested areas where it occurs.

REFERENCES

Stebbins 1954, 1972, Hudson 1957, Linder 1963, Erwin 1964, 1974, Hoyer 1974, Stewart 1977, Macey 1983.

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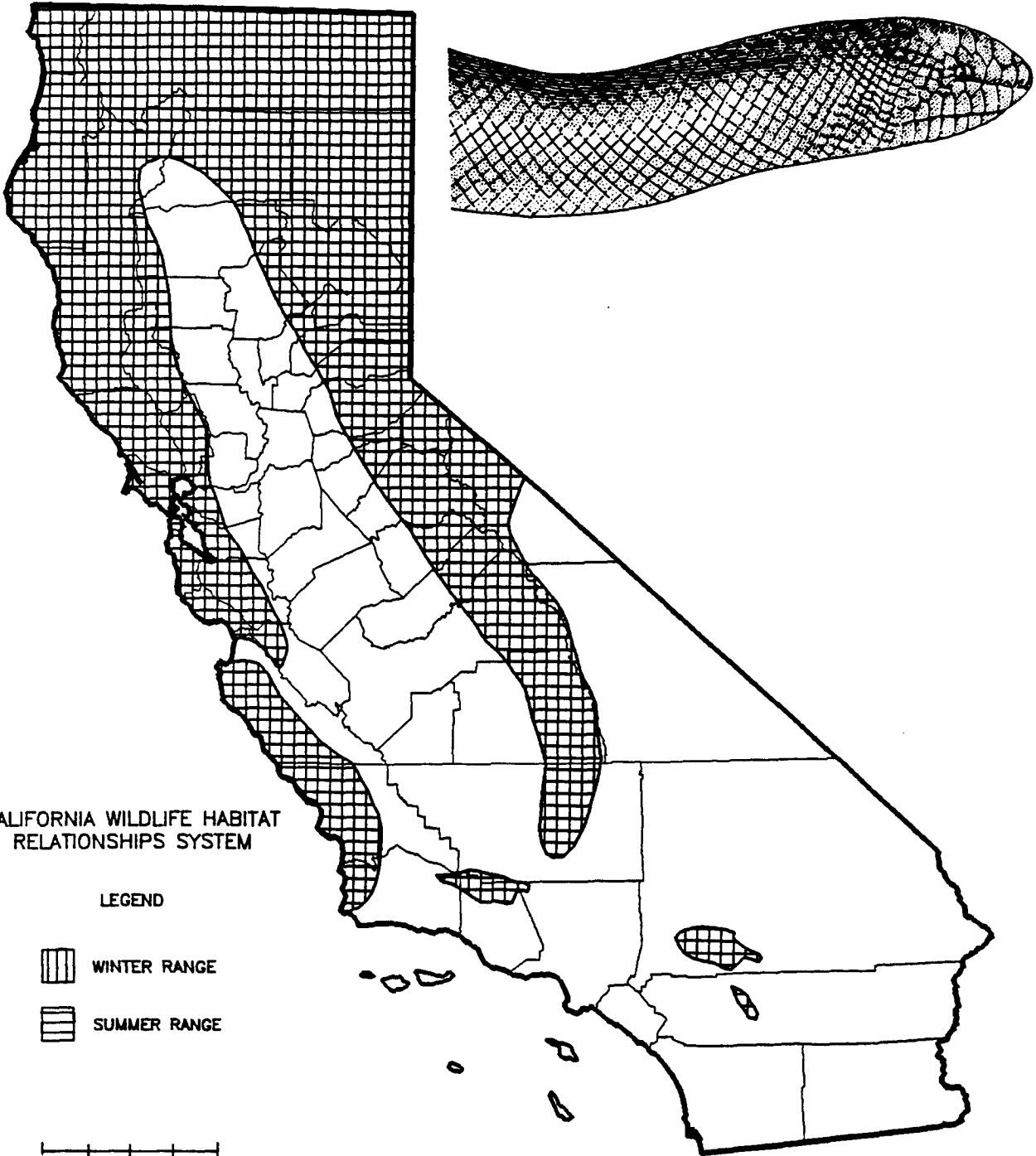
RUBBER BOA

AUTHORSHIP

Species Note Prepared By: S. Morey, H. Basey

Species Note Edited By: R. Duke

Species Note Reviewed By: T. Papenfuss



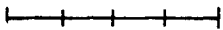
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CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

 WINTER RANGE

 SUMMER RANGE


100 miles

123° 121° 119° 117° 115° 06/87

R052 Coachwhip *Masticophis flagellum*

Family: Colubridae Order: Squamata Class: Reptilia Date: January 21, 1985

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Coachwhips are common to uncommon in arid regions below 1800 m (6000 ft) in California. They are found in deserts south of Mono Co., the Central Valley and surrounding foothills south of Glenn Co., and coastal regions south of Los Angeles Co. Coachwhips occur in open terrain and are most abundant in grass, desert, scrub, chaparral, and pasture habitats (Wilson 1970, Stebbins 1972).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Diet consists of rodents, lizards and eggs, snakes (including rattlesnakes), birds and eggs, young turtles, insects, and carrion (Cowles 1946, Stebbins 1954, Wright and Wright 1957, Carpenter 1958, Cunningham 1959, Miller and Stebbins 1964). Coachwhips search actively for prey, with their heads elevated. They poke their heads in burrows, or climb trees, using both vision and olfaction to detect prey (Stebbins 1954, 1985, Miller and Stebbins 1964), which is consumed alive and whole (Ortenburger 1928, Stebbins 1954, 1985).

Cover: Coachwhips seek cover in rodent burrows, bushes, trees, and rock piles (Stebbins 1954, 1985, Miller and Stebbins 1964). They hibernate in soil or sand approximately 0.3 m (1 ft) below the surface, sometimes at the bases of plants (Wright and Wright 1957).

Reproduction: Little is known about nest sites. One was recorded on the bank of a highway drainage ditch, approximately 0.3 m (1 ft) beneath the ground surface (Wright and Wright 1957).

Water: In desert regions, coachwhips may be attracted to water to drink or ambush prey (Miller and Stebbins 1964).

Pattern: Open habitats are preferred.

SPECIES LIFE HISTORY

Activity Patterns: Diurnal. Coachwhips are usually active mid-morning and late afternoon (Miller and Stebbins 1964) from March through October (Wright and Wright 1957).

Seasonal Movements/Migration: No data.

Home Range: No data.

Territory: No data.

Reproduction: Mating occurs in April and May, eggs are laid June and July, and the first young appear in late August or early September (Stebbins 1954, Wright and Wright 1957, Fitch 1970). Clutch size ranges from 4 to 16 eggs with a mean of 8 to 10 (Stebbins 1954, Wright and Wright 1957, Carpenter 1958, Cunningham 1959, Fitch 1970). The incubation period in the lab is 76-79 days (Stebbins 1954).

Niche: Coachwhips are mainly terrestrial, but occasionally climb trees and bushes to bask, seek prey and cover. These aggressive snakes will bite if captured. They are able to move rapidly, up to 12.8 km (8 mi) per hour (Stebbins 1954, 1985, Miller and Stebbins 1964). Hawks are probable predators, and roadrunners may feed on young coachwhips.

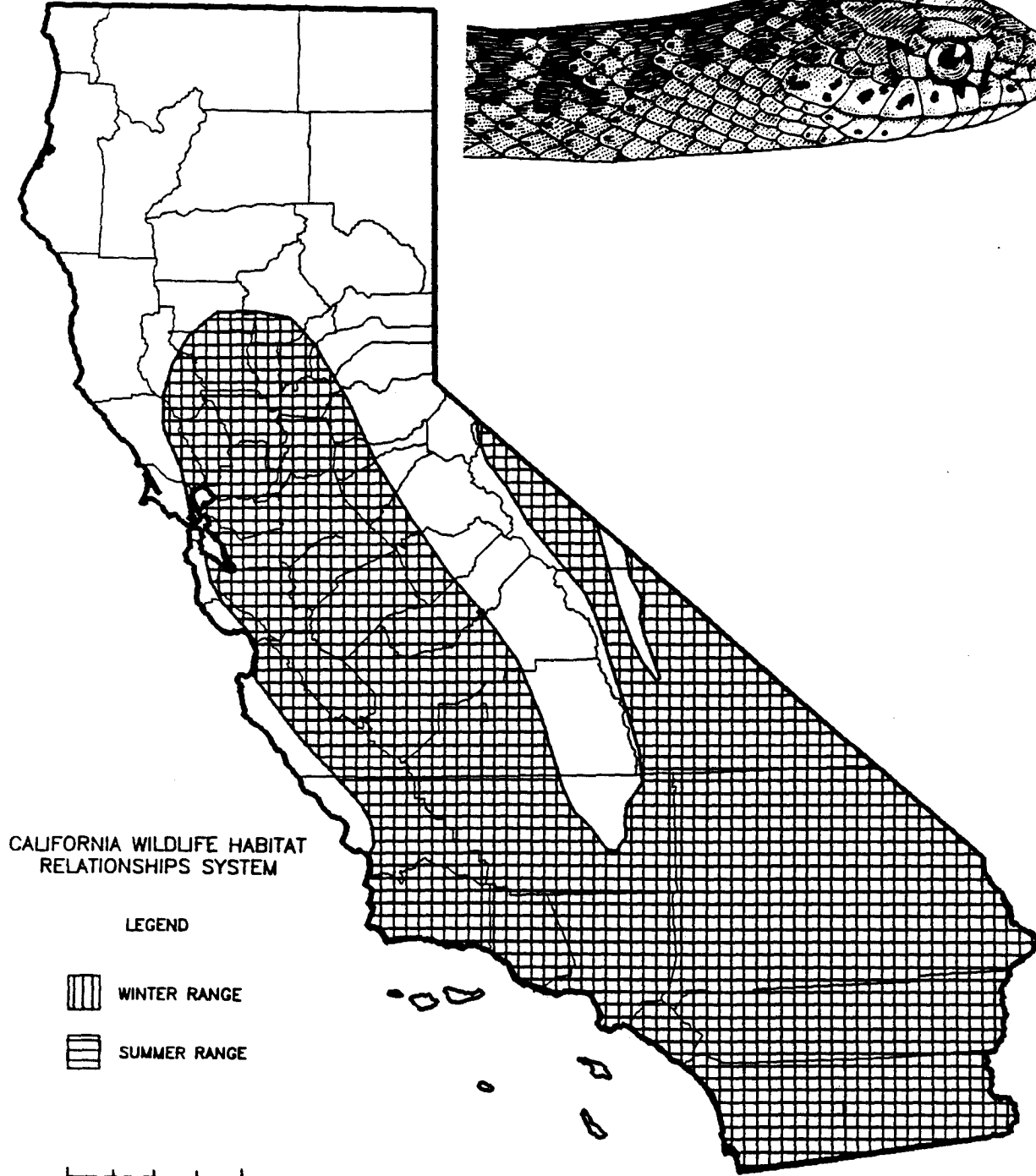
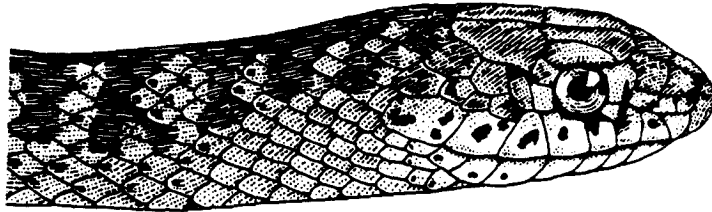
REFERENCES

Ortenburger 1928, Cowles 1946, Brattstrom and Warren 1953, Stebbins 1954, 1972, 1985, Wright and Wright 1957, Carpenter 1958, Cunningham 1959, Miller and Stebbins 1964, Fitch 1970, Wilson 1970, 1973.

COACHWHIP


AUTHORSHIP

Species Note Prepared By: L. Palermo
Species Note Edited By: E. C. Beedy, R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

06/87

R056 Glossy Snake *Arizona elegans*

Family: Colubridae Order: Squamata Class: Reptilia Date: January 21, 1985

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

This snake is common throughout southern California especially in desert regions. Less common to the north, glossy snakes occur in the interior Coast Ranges as far as Mount Diablo in Contra Costa Co. Glossy snakes are most common in desert habitats but also occur in chaparral, sagebrush, valley-foothill hardwood, pine-juniper, and annual grass. Elevation from below sea level to 1830 m (6,000 ft).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Glossy snakes feed on a variety of desert lizards including juvenile desert iguanas (Cunningham 1959), and zebra-tailed lizards (Vitt and Ohmart 1977). They are listed as probable predators of side-blotched lizards by Ferguson *et al.* (1982). Captive individuals have been observed to eat young mice and small birds (Stebbins 1954).

Cover: Primarily nocturnal, glossy snakes spend periods of inactivity during the day and during winter in mammal burrows and rock outcrops, and to a lesser extent under surface objects such as flat rocks and vegetation residue. Individuals occasionally burrow in loose soil.

Reproduction: Eggs are laid a few centimeters below the surface in loose soil, under surface objects or near the base of vegetation, or in abandoned mammal burrows.

Water: No information on water requirements. Glossy snakes are most common in arid regions. Standing water is not an important habitat element.

Pattern: Prefer open sandy areas with scattered brush, but also found in rocky areas.

SPECIES LIFE HISTORY

Activity Patterns: Although some diurnal activity has been reported, glossy snakes are most active at night. Individuals are most commonly encountered in May and June in the south. In the interior Coast Ranges another activity peak occurs prior to the first rains of fall. Periods of winter inactivity occur at all localities.

Seasonal Movements/Migration: Predictable seasonal movements have not been reported for this species in California.

Home Range: The nature of the home range in this species is unknown.

Territory: No evidence for the territorial defense of resources has been reported.

Reproduction: Eggs are probably laid in early July. Clutch sizes range from 3 to 23 (mean 8 or 9). Hatching occurs from late August to mid-September (Stebbins 1954, Aldridge 1979). Mating probably occurs in the spring soon after the end of the period of winter inactivity.

Niche: Glossy snakes may be taken by mammals, owls, and other snakes. The nature of competitive interactions with other species of snakes is unknown. The diet of glossy snakes overlaps to some extent with that of several species of desert snakes.

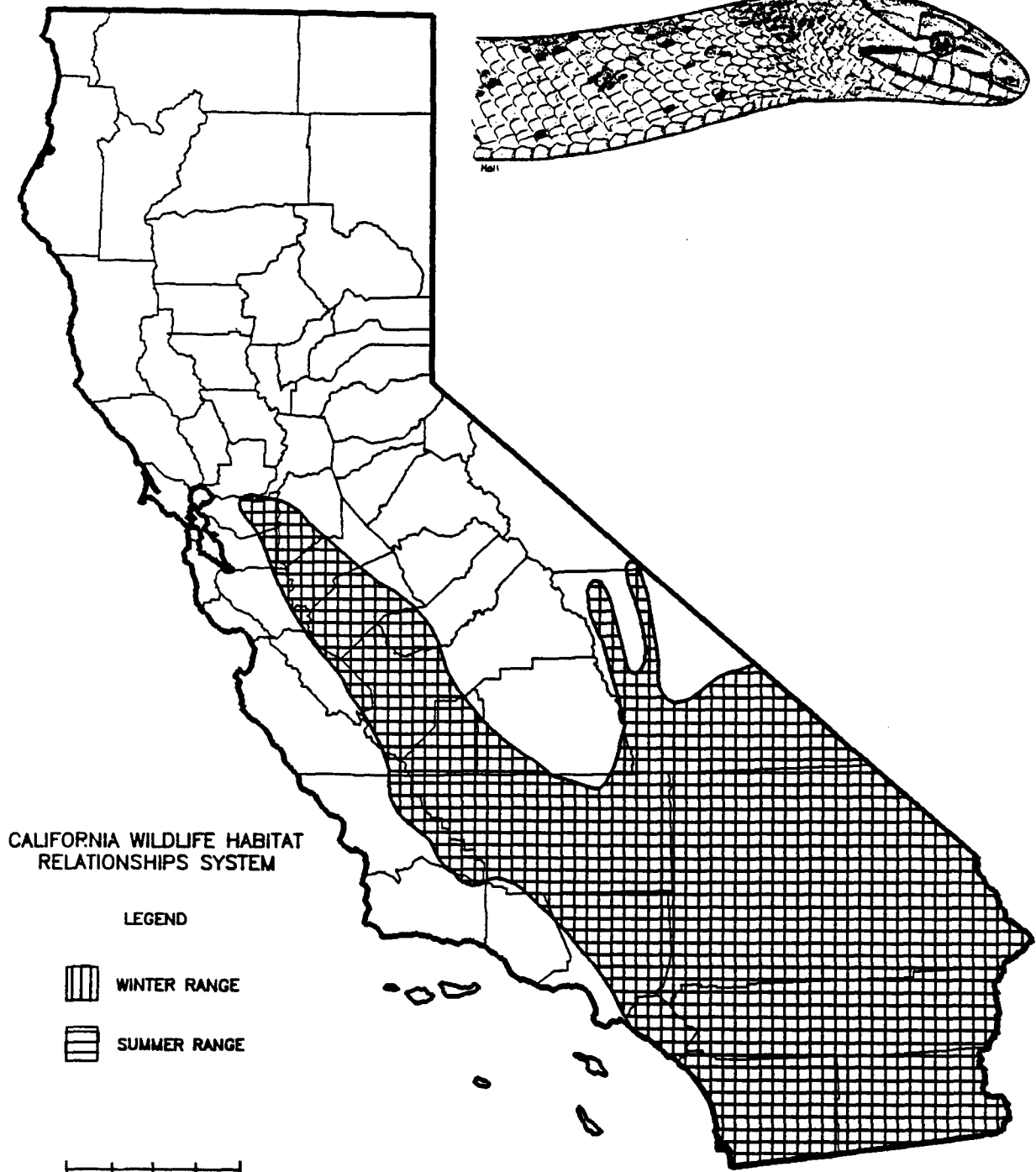
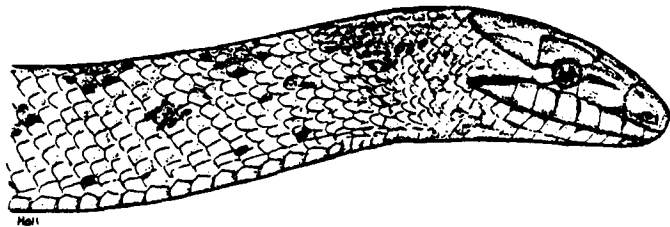
REFERENCES

Klauber 1946, Stebbins 1954, Cunningham 1959, Dixon and Fleet 1976, Vitt and Ohmart 1977, Aldridge 1979, Ferguson *et al.* 1982.

GLOSSY SNAKE

AUTHORSHIP

Species Note Prepared By: S. Morey
Species Note Edited By: R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

86/87

R069 Southwestern Black-headed Snake *Tantilla hobartsmithi*

Family: Colubridae Order: Squamata Class: Reptilia Date: February 28, 1985

DISTRIBUTION, ABUNDANCE AND SEASONALITY

The southwestern black-headed snake is an uncommon species found in California in Inyo, San Bernardino, Kings and Tulare cos. Recently redescribed (Cole and Hardy 1981), the species may be more widespread and common but few data are available. May also be present in Kern and Fresno cos., but there are no verified records. Elsewhere, the species ranges patchily throughout the southwest and into Mexico. These secretive, fossorial snakes are found in a variety of arid habitats, including desert riparian, pine-juniper, sagebrush, alkali scrub, Joshua tree and perennial grass. Ranges up to 1440 m (4750 ft) in the Kingston Mts, San Bernardino Co. (Stebbins 1954, Banta 1960, Cole and Hardy 1981, 1983).

SPECIFIC HABITAT REQUIREMENTS

Feeding: The few records available indicate a preference for invertebrate prey. Beetle larvae, and centipedes have been reported (Minton 1959). Millipedes, spiders and other invertebrates are probably taken as well.

Cover: Fossorial. Friable, organic or sandy soil probably required. The species is often found under loose boards, logs, wood, rocks and fallen shrubs.

Reproduction: Habitat requirements are unknown. Eggs are probably laid in crevices, rotting logs, or abandoned mammal burrows.

Water: No data. More common near water sources.

Pattern: Prefers moist niches in otherwise arid or semi-arid habitats, with debris, and friable soil.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, probably nocturnal activity. Specimens have been collected throughout the year (Cole and Hardy 1981), but the species may have periods of relative inactivity. Other black-headed snakes are inactive in winter.

Seasonal Movements/Migration: No known seasonal movements.

Home Range: No data.

Territory: No data.

Reproduction: Oviparous. Timing of reproduction is unknown, but Minton (1959) and Easterla (1975) report eggs laid June-August in Texas. Clutch is apparently a single large egg, ranging in size from approximately 4 X 17 mm (0.2 X 0.7 in) for 2 specimens in California (Stebbins 1954) to 7 X 28 mm (0.3 X 1.1 in) for an egg in Texas (Easterla 1975).

Niche: No records of predation on the species in nature (Cole and Hardy 1981). Vitt and Hulse (1973) reported that the Sonoran coral snake will eat *Tantilla planiceps* in captivity.

Comments: The genus *Tantilla* has been subject to a series of recent revisions (Tanner 1966, Cole and Hardy 1981). Originally described by Taylor (1936) from Sonora, Mexico, this species was thereafter usually considered synonymous with *T. atriceps*. Cole and Hardy (1981) revised the genus, based largely on the anatomy of the hemipenes. The literature regarding the genus is, therefore, somewhat confused. Cole and Hardy (1981) provide a brief taxonomic history. The specific epithet honors Dr. Hobart M. Smith.

REFERENCES

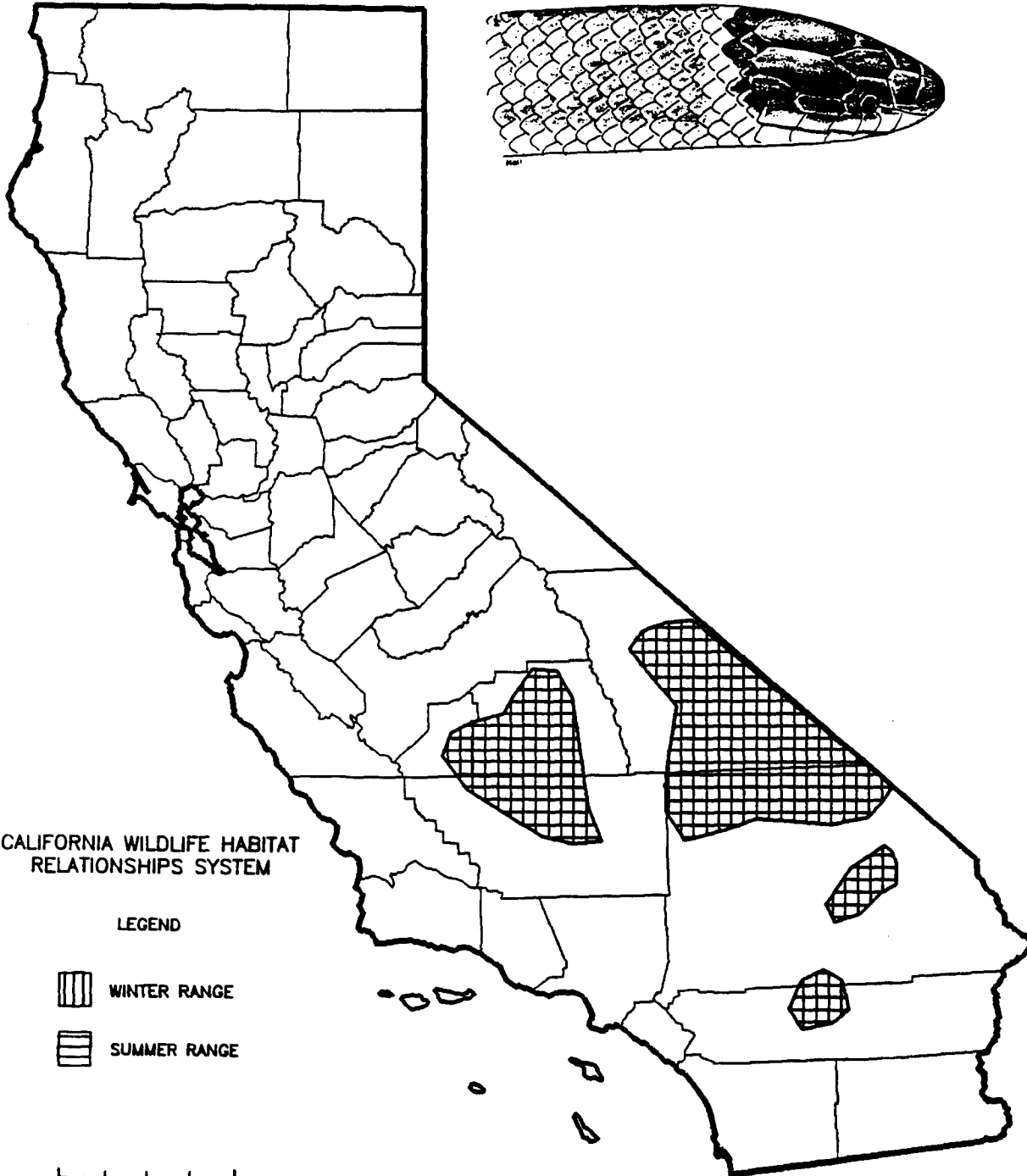
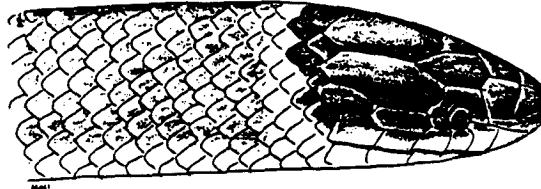
Taylor 1936, Stebbins 1954, Minton 1959, Banta 1960, Tanner 1966, Vitt and Hulse 1973, Easterla 1975, Cole and Hardy 1981, 1983.

123° 121° 119° 117° 115°

SOUTHWESTERN BLACK-HEADED SNAKE

AUTHORSHIP

Species Note Prepared By: R. Duke
Species Note Edited By: R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

123° 121° 119° 117° 115°

86/87

43°
41°
39°
37°
35°
33°

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

This common snake is wide-ranging in California, absent only from the high mountains of the Sierra Nevada, desert regions, and most of the floor of the San Joaquin Valley. Also found on Santa Cruz Island off southern California. Elevation sea level to 2010 m (6700 ft). Racers are found in many habitat types within their range in California. They are most common in open country and are generally absent from densely forested habitats.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Racers are active diurnal predators and appear to rely heavily on visual cues for prey finding. Small mammals, birds, snakes, (cannibalism has been reported) lizards, frogs, and insects are all commonly taken as food by racers (Cunningham 1959, Jackson 1971, Brown 1973, Best 1974, Nussbaum *et al.* 1983).

Cover: When not moving about on the surface, racers seek cover under surface objects such as flat rocks, logs, and debris. In warmer areas brief periods of winter inactivity are spent under such cover, but where winters are colder hibernation is usually passed in the shelter of a rockpile or den within a rocky outcrop. Large numbers of racers, as well as other species of snakes, are known to hibernate in dens in rock accumulations in Utah (Parker and Brown 1973). Groups of hibernating racers have also been found in small caves (Drda 1968) and in mammal burrows (Cohen 1948, Schroder 1950).

Reproduction: Eggs are laid 5 to 7 cm (2-3 in) below the surface in stable rock talus, under large rocks, in abandoned mammal burrows, under rotting logs, or in soft moist soil (Stebbins 1954, Swain and Smith 1978, Nussbaum *et al.* 1983).

Water: No information on water requirements.

Pattern: They are most common in open country and are generally absent from densely forested habitats.

SPECIES LIFE HISTORY

Activity Patterns: Strongly diurnal, racers become active in March or April after a variable period of winter hibernation. Adults become inactive again in October but juveniles may extend their period of activity until November if conditions are suitable.

Seasonal Movements/Migration: In Utah, where racers utilize the same hibernacula year after year, they may migrate up to 1.8 km (1.1 mi) to and from their warm-season areas of activity (Brown and Parker 1976). In milder areas snakes spend brief periods of winter activity under surface objects and no migrations occur.

Home Range: Racers at one locality in Utah (Brown and Parker 1976) were found to have an average home range size of 0.38 ha (1.04 ac).

Territory: No evidence for the territorial defense of resources has been reported. Communal hibernation and egg-laying are well documented.

Reproduction: Three to 13 eggs are laid by the California subspecies in July and August. Courtship and copulation have been observed as late as July in the Sierra (Cunningham 1959). Communal nesting has been observed on several occasions (Brodie *et al.* 1969, Foley 1971, Parker and Brown 1972, Swain and Smith 1978).

Niche: These aggressive and active diurnal snakes are taken as food by a variety of mammals, diurnal birds, especially hawks, and snakes such as king-snakes and striped racers. The social nature of this snake is demonstrated by its tendency towards communal hibernation and egg-laying.

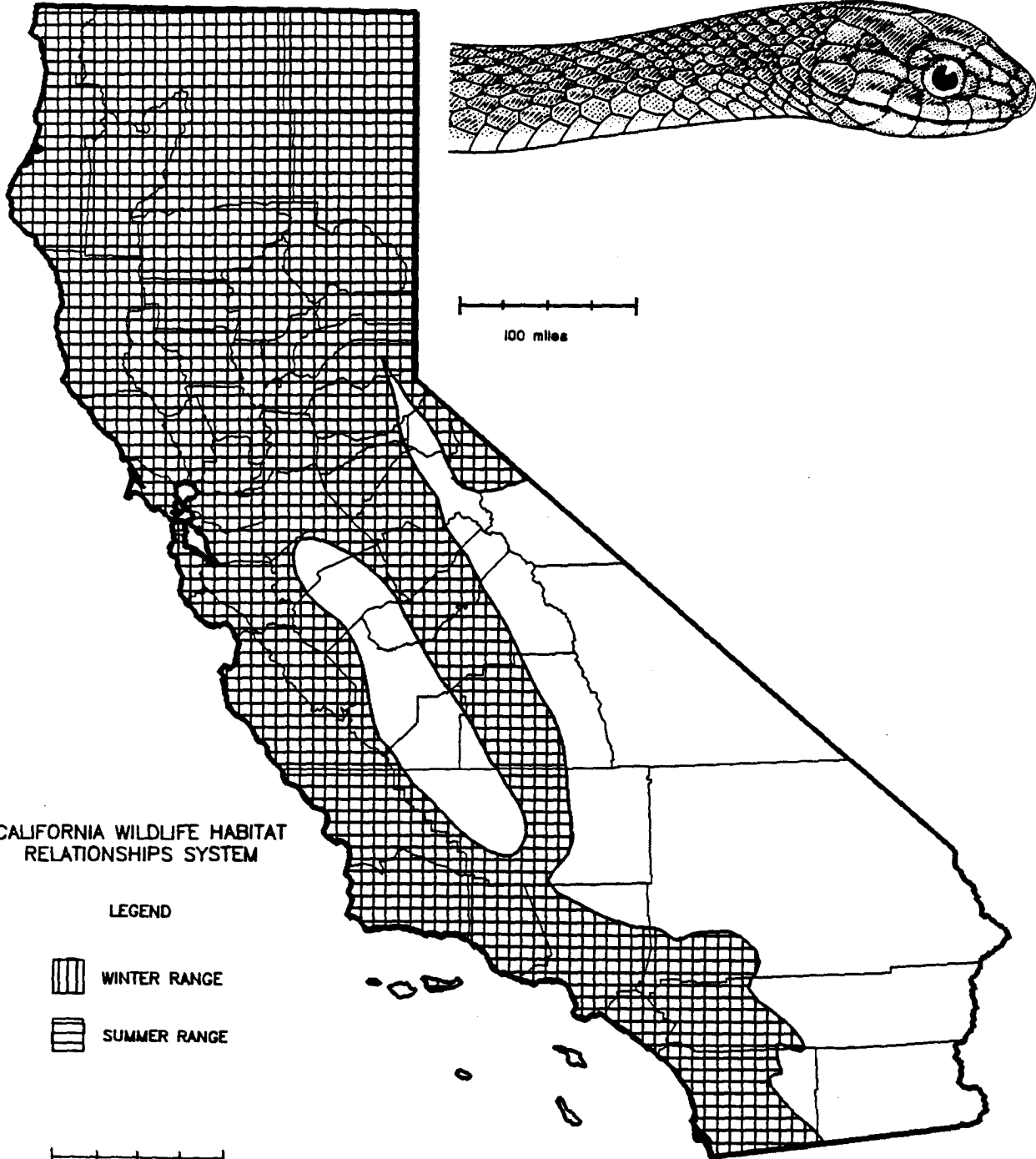
REFERENCES

Cohen 1948, Schroder 1950, Stebbins 1954, Cunningham 1959, Drda 1968, Brodie *et al.* 1969, Foley 1971, Jackson 1971, Parker and Brown 1972, 1973, Brown 1973, Best 1974, Brown and Parker 1976, Swain and Smith 1978, Nussbaum *et al.* 1983.

RACER

AUTHORSHIP

Species Note Prepared By: S. Morey
Species Note Edited By: R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

-  WINTER RANGE
-  SUMMER RANGE

06/87

R055 Western Patch-nosed Snake *Salvadora hexalepis*

Family: Colubridae Order: Squamata Class: Reptilia Date: January 21, 1985

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The western patch-nosed snake is widely distributed throughout the lowlands, up to 2120 m (7000 ft), of southern California from the coast to the eastern border. The species ranges north in desert habitats through Owens Valley, and also occurs in the vicinity of Honey Lake, Lassen Co. It is found in coastal chaparral, desert scrub, washes, sandy flats and rocky areas. It seems to be more common in coastal areas than desert but there is little information on abundance (Bogert 1939, 1945, Stebbins 1954).

SPECIFIC HABITAT REQUIREMENTS

Feeding: This snake seems to be an opportunistic feeder. Reported prey items are lizards (*Cnemidophorus*, *Coleonyx*), small mammals (*Dipodomys*), and the eggs of lizards and snakes. It probably eats anything it can overpower (Stebbins 1954).

Cover: This is an active, diurnal snake. Occasionally, it takes refuge in bushes, rock crevices and the burrows of other animals. It has been found under objects. It seems able to thrive in most environments, making use of whatever cover is available (Stebbins 1954).

Reproduction: Nothing is known about reproductive requirements. Probably friable or sandy soil or the presence of rodent burrows are needed.

Water: Water is probably not required.

Pattern: The western patch-nosed snake is a broad generalist in its diet and habitat requirements (Stebbins 1954).

SPECIES LIFE HISTORY

Activity Patterns: This species is diurnal. In the milder months of spring it can be found throughout the day. In summer, activity is restricted to mornings and late afternoons. Snakes may be active all year in the southern part of the state during mild to warm weather. Normally snakes are active in spring and early summer, with greatest activity occurring in May and June.

Seasonal Movements/Migration: None.

Home Range: No data.

Territory: No data.

Reproduction: Mating probably takes place from April to June. Clutches average 5 to 6 eggs. Gravid females have been found from May to August (Fitch 1970). Laboratory incubation of eggs required 85 days (Stebbins 1954).

Niche: The western patch-nosed snake is probably preyed upon by raptors, roadrunners, most diurnal mammalian carnivores, kingsnakes and other snake predators, but no records of predation are known. Nothing is known about competitors, diseases, parasites or weather. This species is widely distributed and poorly known.

REFERENCES

Bogert 1939, 1945, Stebbins 1954, 1985, Fitch 1970.

123°

121°

119°

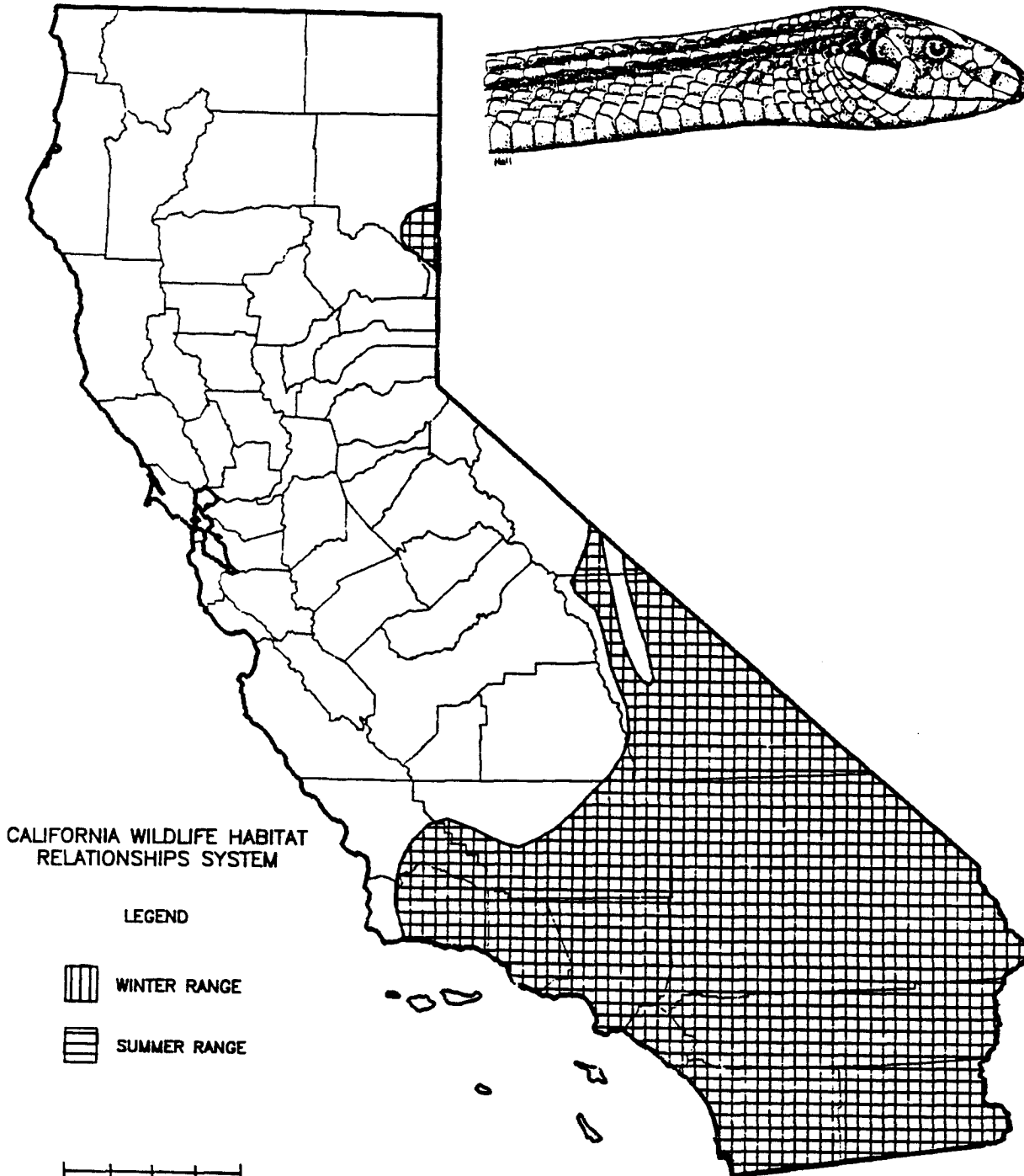
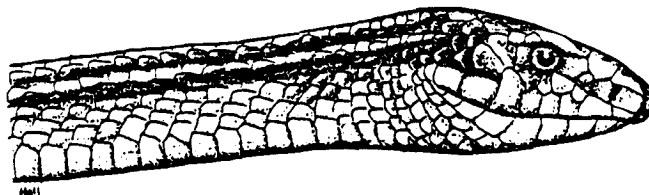
117°

115°

WESTERN PATCH-NOSED SNAKE

AUTHORSHIP

Species Note Prepared By: R. Marlow
Species Note Edited By: J. Harris, R. Duke
Species Note Reviewed By: T. Papenfuss



CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

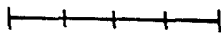
LEGEND



WINTER RANGE



SUMMER RANGE



100 miles

123°

121°

119°

117°

115°

06/87

R029 Coast Horned Lizard *Phrynosoma coronatum*

Family: Iguanidae Order: Squamata Class: Reptilia Date: January 18, 1985

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The coast horned lizard is uncommon to common in suitable habitat. Occurs in valley-foothill hardwood, conifer and riparian habitats, as well as in pine-cypress, juniper and annual grass habitats. Ranges in the Central Valley from southern Tehama Co. south; in the Sierra foothills from Butte Co. to Tulare Co. below 1200 m (4000 ft); below 1800 m (6000 ft) in the mountains of southern California exclusive of desert regions; throughout the Coast Ranges south from Sonoma Co. There is an isolated population in Siskiyou Co.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Horned lizards forage on the ground in open areas, usually between shrubs and often near ant nests. Pianka and Parker (1975) noted that this species, like other horned lizards, consumes many ants. Small beetles are taken in large numbers when especially abundant. Stebbins (1954) reported other insects as food items, including wasps, grasshoppers, flies, and caterpillars.

Cover: This species relies on camouflage for protection and often hesitates to move at the approach of a predator. Horned lizards often bask in the early morning on the ground or on elevated objects such as low boulders or rocks. Predators and extreme heat are avoided by horned lizards by burrowing into loose soil. Periods of inactivity and winter hibernation are spent burrowed into the soil under surface objects such as logs or rocks, in mammal burrows, or in crevices.

Reproduction: Little is known about habitat requirements for breeding and egg-laying. Males may use elevated "viewing platforms" such as cow dung (Tollestrup 1981) to locate females during the reproductive season. Eggs are apparently laid in nests constructed by females in loose soil.

Water: No information on water requirements. Does not require permanent water.

Pattern: Inhabits open country, especially sandy areas, washes, flood plains and wind-blown deposits in a wide variety of habitats. Found chiefly below 600 m (2000 ft) in the north and 900 m (3000 ft) in the south.

SPECIES LIFE HISTORY

Activity Patterns: Being a diurnal lizard, most activity occurs during the middle of the day in the spring and fall but is restricted to morning and late

afternoon during mid-summer. Nocturnal activity may occur during particularly warm periods. Fall and winter are inactive periods in most areas.

Seasonal Movements/Migration: Pronounced seasonal movement or migration has not been reported. Habitat requirements, such as sites for courtship and display, egg-laying, and hibernation are apparently found within the normal area of activity.

Home Range: Little is known about home range. In Arizona, some individuals of a related horned lizard species, *P. solare*, established well-defined home ranges, while some wandered without establishing one. Males used a larger area than females; the mean maximum distance between capture points was 30 m (98 ft) for males and 15 m (49 ft) for females (Baharav 1975).

Territory: Horned lizards generally lack territorial defense (Lynn 1965, Stamps 1977), but combat between males (Whitford and Whitford 1973) and over female feeding territories (Nussbaum et al. 1983) has been reported.

Reproduction: The reproductive season for the coast horned lizard varies from year to year and geographically depending on local conditions. Pianka and Parker (1975) reported that egg-laying in southern California extends from late May through June with a mean clutch size of 13 eggs. Stebbins (1954) reported a range of 6 to 16 eggs. Hatching probably occurs after two months. The coast horned lizard is apparently unique among lizards in using a belly-to-belly position during copulation (Tollestrup 1981).

Niche: The spiny armour and aggressive behavior towards potential predators exhibited by horned lizards confer only partial immunity from predators. Leopard lizards, sidewinders, striped whipsnakes and other snakes, loggerhead shrikes, and hawks have all been reported as predators of horned lizards. After a review of the genus *Phrynosoma*, Pianka and Parker (1975) concluded that because of their rather specialized diets, most horned lizards probably experience little competition for food from other coexisting lizards.

REFERENCES

Stebbins 1954, Lynn 1965, Whitford and Whitford 1973, Baharav 1975, Pianka and Parker 1975, Stamps 1977, Tollestrup 1981, Nussbaum et al. 1983.

123°

121°

119°

117°

115°

COAST HORNED LIZARD

AUTHORSHIP

Species Note Prepared By: S. Morey
Species Note Edited By: D. Alley, R. Duke
Species Note Reviewed By: T. Papenfuss

43°

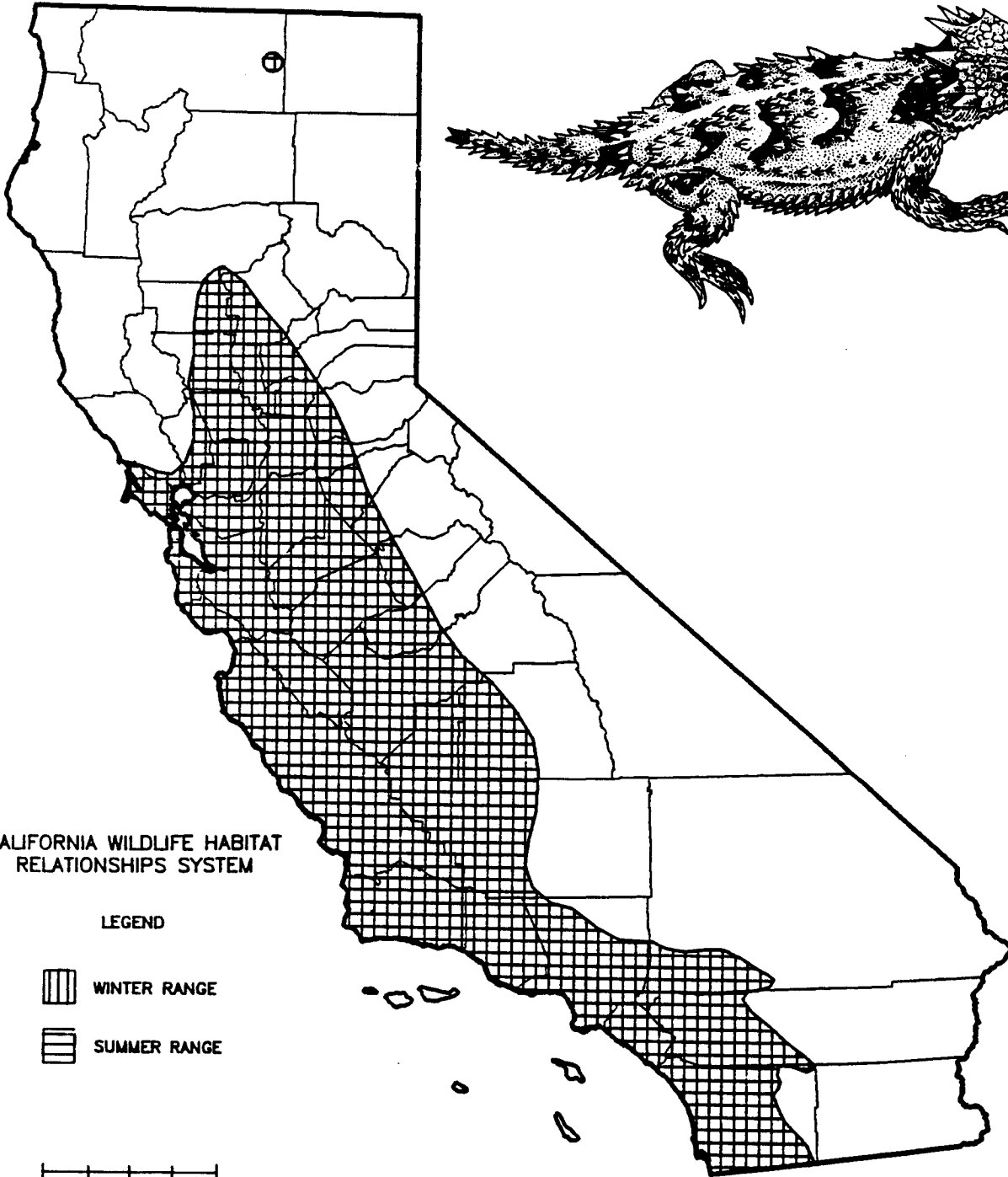
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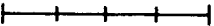


CALIFORNIA WILDLIFE HABITAT
RELATIONSHIPS SYSTEM

LEGEND

 WINTER RANGE

 SUMMER RANGE


100 miles

123°

121°

119°

117°

115°

86/87

difficult to detect near the surface in non-spring situations, so it may be more widespread than current data indicate. Novel sampling techniques will be needed to verify this.

Status: Threatened; the relatively restricted distribution of this California endemic to limited habitat in the Inyo Mountains and the very small area of estimated ideal habitat may make this species especially vulnerable to habitat alteration. Much of its known habitat is associated with springs that can attract significant human (*Homo sapiens*), horse (*Equus caballus*), and burro (*E. asinus*) activity that is likely to imperil its survival. Its restricted geographic range also makes it particularly susceptible to extinction from catastrophic climatic or geomorphologic events of regional scale.

Management Recommendations: A thorough understanding of the specific habitat requirements significant to the survival of this species are an absolute prerequisite to refining management efforts for this species. Until specific habitat data become available, efforts should be directed at protecting the habitat ensemble associated with the springs and other riparian areas where *B. campi* has been found, and in particular, efforts should be made to avoid any alterations that might modify the hydrology of these areas. The practice of opening and clearing springs with explosives for enhancement of upland species and other animals (see Marlow et al. 1979) should be prohibited within the known and suspected range of this species. Capping of springs has been identified as the major threat to the survival of *B. campi* (Macey and Papenfuss 1991a). A combination of water diversion from springs, disturbance of the substrate through mining, and damage to potentially sheltering riparian plants by feral burros and domestic cattle (*Bos taurus*) currently pose some degree of threat to every one of the 16 localities where this species is known to occur. Existing populations of *B. campi* would be better protected if the areas associated with the springs in which they occur were closed to vehicles and mining (see Marlow et al. 1979). Concerted efforts should be made to search for this species in other nearby springs when sufficient surface moisture is present to induce near-surface activity in this salamander. Protection of this species would be assisted through initiation of land use restriction measures in the Inyo Mountains, which would anticipate future finds of this species outside of its known range.

RELICTUAL SLENDER SALAMANDER *Batrachoseps relictus* Brame and Murray 1968

Description: A moderate-sized (32.1-48.1 mm SVL), dark black slender salamander with a very dark brown dorsal band extending from the forelimbs to the base of the tail and gray-black undersurfaces (Brame and Murray 1968). Sixteen to 20 costal grooves are present (Stebbins 1985). The iris is dark brown or black (R. Hansen, pers. comm.).

Taxonomic Remarks: Brame and Murray (1968) included salamanders from four disjunct regions (the central Coast Ranges, the southern Sierra Nevada Mountains, Santa Cruz Island, and the San Pedro Mártir Mountains of Baja California) within *Batrachoseps relictus*, but Yanev (1980) restricted *relictus* to the Sierran populations. Yanev (1980) treats *relictus* as a subspecies of *B. pacificus*, but the geographic pattern of genetic variation across what is termed *B. relictus* here is poorly understood. Both the work of Yanev (1978) and unpublished data (D. Wake and R. Hansen, pers. comm.) suggest that *B. relictus*, as treated here, may represent several species.

Distribution: This California endemic complex of populations is currently known from the vicinity of Briceburg, Mariposa County south to the Kern River Canyon, Kern County (Figure 3), but the northern limits of the range remain poorly understood. Its known elevation range extends from 182 m to 2438 m (R. Hansen, pers. comm.).

Life History: Virtually nothing is known of the life history of this taxon. As with other members of the genus, direct development is presumed. A probable communal nest of this taxon similar to the one described for the Breckenridge Mountain slender salamander (see subsequent account) has recently been discovered (R. Hansen, pers. comm.).

Habitat: Details of the habitat requirements of this taxon are poorly understood. It has been found under a range of surface objects ranging from rocks to bark and other tree debris. This taxon may be more difficult to detect near the surface in situations where movable surface objects are absent, so it may be more widespread than current data indicate. Novel sampling techniques will be needed to properly evaluate this possibility.

Status: Special Concern; The known range of this unique California endemic is relatively restricted (i.e., the southern Sierra Nevada) and lies within a region that has undergone extensive local development and changes in land use patterns over the last 20 years (Moyle 1973, California Department of Forestry and Fire Protection 1988). Despite extensive searches at suitable time intervals, no salamanders have been found at the type locality of *B. relictus* in Lower Kern River Canyon since 22 April 1970 (D. Wake, pers. comm.). Moreover, no salamanders have been found at eight sites in Kern Canyon where they were relatively common in the 1960s (R. Hansen, pers. comm.).

Management Recommendations: Systematic study of *B. relictus* to identify how many taxa are really present and the geographic range of each is the basic foundation needed prior to all other studies. Once taxa are identifiable, the habitat requirements of each need to be better understood before really effective management recommendations can be made. Much of the most basic data on the biology of this complex of populations are lacking. Phenological studies integrated with identifying the components of habitat structure essential to these salamanders are especially needed. In the absence of significant data, the recommendations made for *B. campi* apply to this species. Sites where *B. relictus* are known to occur should be protected from disturbance, especially alterations that may affect local hydrology. Particular attention should be paid to how more subtle (remote) effects may affect the local water table and soil moisture regimes, and such potential effects should be assessed for a significant radius around sites known to harbor *B. relictus*. What a significant radius is will have to be established through study of populations of *B. relictus* and the range of variation in local hydrologies. More specific recommendations will be possible after data from the suggested studies on *B. relictus* become available.

BRECKENRIDGE MOUNTAIN SLENDER SALAMANDER
Batrachoseps sp.

Taxonomic Remarks: Individuals representing this currently undescribed taxon were likely first found in 1977, although it was not recognized that this population represented a unique taxon until somewhat later on. Unpublished genetic data indicate that this taxon, which is being described by David B. Wake and Robert W. Hansen, is distinctive.

Distribution: This California endemic is known only from a single locality at approximately 1920 m near Squirrel Meadow on Breckenridge Mountain, Kern County (Figure 4).

Life History: Little is known of the life history of this species; only eggs and adults have been observed or collected. Robert W. Hansen (pers. comm.) found a probable communal oviposition site, approximately 150 eggs in a moist location under a large rock. Eggs and gravid females were observed in June. The eggs look similar to those of other *Batrachoseps*, so the species probably undergoes direct development.

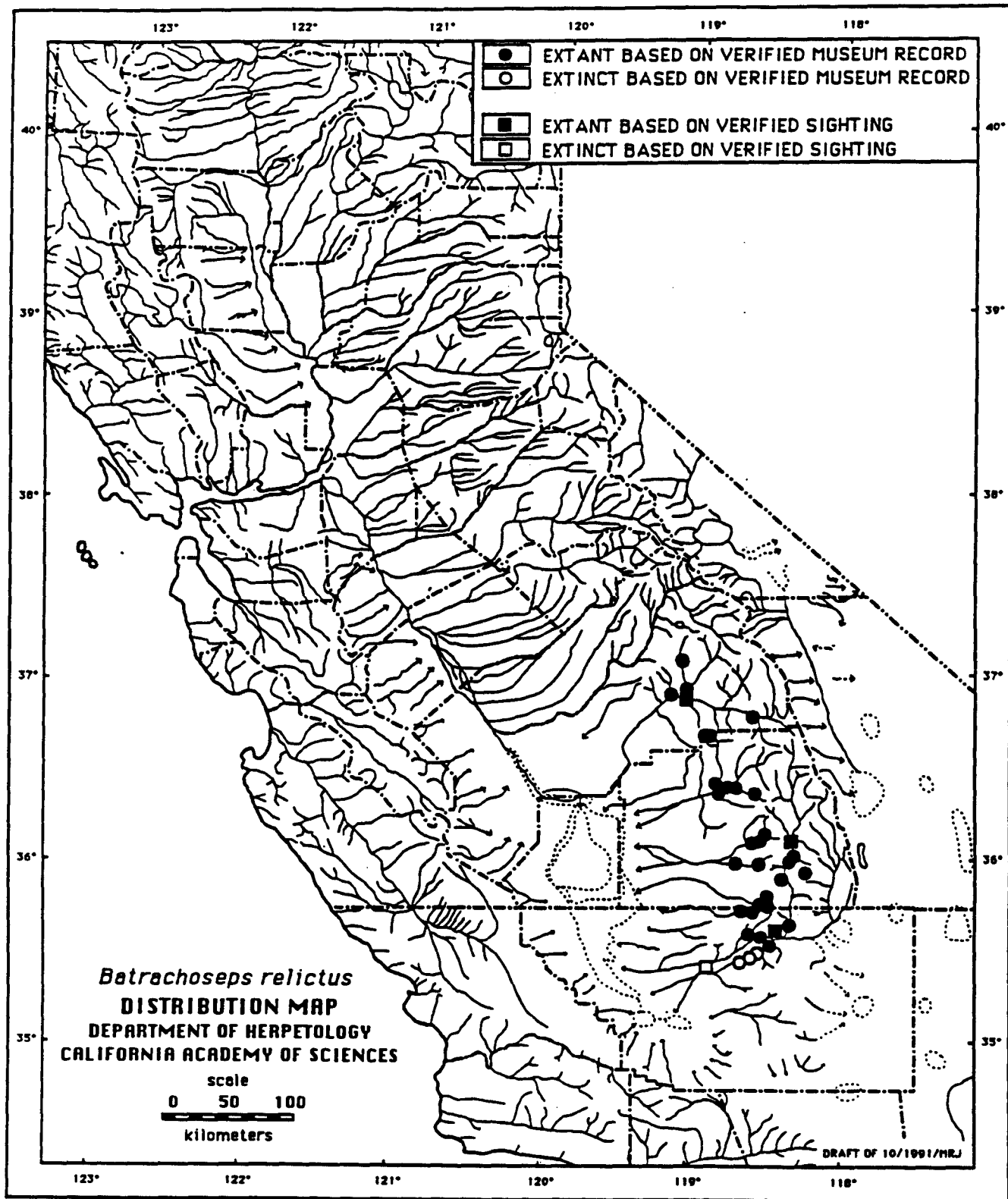


Figure 3. Historic and current distribution of the relictual slender salamander (*Batrachoseps relictus*) in central California based on 73 locations from 154 museum records and 19 records from other sources.

White Sturgeon

White sturgeon inhabit the larger rivers and estuaries of the Pacific Coast. In central California, they live primarily in the Sacramento-San Joaquin estuary, where they support a substantial sport fishery. Presumably, part of that population once spawned in the lower San Joaquin River, but they are probably prevented from doing so today through a combination of poor water quality and low stream flows.

Delta Smelt

Delta smelt are endemic to the upper portions of the Sacramento-San Joaquin estuary and were probably never common in the areas considered in this paper. In recent years, however, they have shown a severe overall decline in their population and range (Moyle et al., in press).

Chinook Salmon

Chinook salmon once had spectacular runs up the San Joaquin River and its tributaries. When an artificial connection was made between the San Joaquin and Kings rivers in the late 19th century, the salmon quickly colonized the Kings also. As development of the spawning streams proceeded, and overfishing continued, the salmon stocks dwindled. The biggest single blow was the construction of Friant Dam, which effectively destroyed the runs that depended on the main San Joaquin River by blocking access to spawning grounds and reducing flows. Small remnant runs exist only in the lower Mokolumne, Consumnes, Stanislaus, Tuolumne, and Merced rivers (Reavis 1986). In wet years, a few salmon may actually make it as far as Friant Dam and occasionally into the Kings River (where successful spawning was recorded in 1969).

Coastal Rainbow Trout

Coastal rainbow trout consist of two basic types: steelhead, which are anadromous, and resi-

dent rainbows, which complete their entire life cycle in fresh water. The prehistoric distributions of these forms in the San Joaquin drainage can only be guessed, because hatchery rearing and transplantation of rainbow trout was a common practice long before any interest was taken in their original distribution. Two prehistoric patterns are likely: (1) resident rainbows were rarely found above 1,500-2,000 m in elevation because of natural barriers; and (2) steelhead spawned in accessible areas of the major tributaries to the San Joaquin River, and in the upper reaches of the river itself. Today, there are only small remnant steelhead runs in the northernmost tributaries. Resident rainbows are found throughout the Sierra Nevada, wherever the water is cold enough, as a result of planting programs. These rainbows have a mixed genetic heritage because of cross-breeding of strains in hatcheries.

Kern River Rainbow Trout

Kern River rainbow trout are a heavily spotted rainbow trout with a golden sheen that are native only to the upper Kern River. Their taxonomic status has been controversial and only recently has it been resolved that they are a distinct subspecies of rainbow trout (Berg 1987). Because of the planting of hatchery rainbow trout and habitat alterations on the Kern River, the Kern River rainbow is uncommon and is managed as a threatened trout by the CDFG.

Volcano Creek Golden Trout

Volcano Creek golden trout are native only to the Volcano Creek drainage of the upper Kern River. Most golden trout populations that have been established elsewhere in the Sierra Nevada and the Rocky Mountains originated by planting fish from the Volcano Creek population. While the subspecies is consequently widespread, the original populations have been brought back from the brink of extinction only by intensive management, especially the elimination of introduced brown trout (*Salmo trutta*).

METHODS

In this paper, we consider the San Joaquin drainage to include all waters draining into the San Joaquin Valley, including the Kern, Tule, Kaweah, San Joaquin, Kings, Merced, Tuolumne, and Stanislaus rivers, as well as small streams on the west side of the valley and the waters of the valley floor, excluding the Sacramento-San Joaquin Delta. Early information on the fishes of this region is scattered and largely anecdotal (references in Moyle and Nichols 1974, Moyle 1976). In 1970 and 1971, Moyle and Nichols (1974) systematically sampled the fishes of the Sierra foothills. Various sites at low elevations were sampled by the California Department of Fish and Game (CDFG) in 1974 and 1975 in an effort to locate remnant populations of the thicketail chub (*Gila crassicauda*) and at high elevations in various years in relation to trout and salmon management (unpubl. data). Saiki (1984) reported the results of fish surveys conducted by the U.S. Fish and Wildlife Service in 1980 and 1981 in the San Joaquin River. In 1986, the CDFG sponsored a survey by the authors, which was designed to (1) resample the sites of Moyle and Nichols (1974) to see if the faunal decline had continued; (2) sample additional sites for native fishes; (3) determine the status of the Kern brook lamprey (*Lampetra hubbsi*); and (4) determine if morphologically distinct populations of California roach (*Lavinia symmetricus*) exist. Most of the information in this paper comes from this last survey (Brown and Moyle 1987).

RESULTS AND DISCUSSION

Status of Species

Nineteen species and four subspecies of native fishes have been recorded from the San Joaquin drainage, three of them endemic to the drainage. Today, 14 (61%) of these taxa are uncommon, rare, or extinct. Table 1 summarizes information on the

original distribution, ecology, habitat, and present status of each of the native taxa. The status of each of these taxa is discussed below.

Kern Brook Lamprey

Kern brook lamprey are small (to 15 cm total length) nonpredaceous lamprey that were first described by Vladykov and Kott (1976) from individuals collected in the Friant-Kern canal. Despite our survey, their status is still uncertain, as adults are present only for a short time each season, and the larvae (ammocoetes) cannot be distinguished by morphometric techniques from the Pacific brook lamprey (*Lampetra pacifica*). The Pacific brook lamprey has been identified from the drainage, but the specimens from the San Joaquin system were assigned to Pacific brook lamprey before Kern brook lamprey were described. It is likely that these were actually Kern brook lamprey (Brown and Moyle 1987). The Kern brook lamprey were found in low numbers (but locally common) in the lower reaches of the Kaweah, Kings, San Joaquin, and Merced rivers, making it a San Joaquin Valley endemic. They are present above reservoirs on the San Joaquin and Kings rivers. The lamprey are probably much less abundant than formerly, because the principal habitat of the ammocoetes is silty backwaters of large rivers at low elevations. This habitat is now scarce because of impoundments on the lower rivers and upstream diversions.

Pacific Lamprey

Pacific lamprey are the common predatory lamprey of the Pacific Coast. Most populations are anadromous and will migrate considerable distances to spawn. Today, the ammocoetes are found only in the San Joaquin proper, tributaries to the San Joaquin River, and the lower reaches of some of their major tributaries. In wet years, adults have been observed spawning below Friant Dam near Fresno.

SNOUT BUTTERFLIES Family Libytheidae Not illus.
 Identification: Similar to Nymphalidae (p. 226), but labial palps longer than thorax, thickly hairy, and projecting forward.
 Our only species in this group has distinctively shaped front wings and a wingspread of about $1\frac{1}{2}$ in. It occurs throughout the East and Southwest, but is uncommon in the Northeast. Larva feeds on hackberry.

HELICONIANS Family Heliconiidae
 Identification: Similar to Nymphalidae (p. 226), but FW narrow, elongate, and HW humeral vein *bent toward base of wing*.
 Our few species of heliconians occur in the South. One of the most strikingly colored is the Zebra Butterfly, *Heliconius charitonius* (Linn.), which is black with yellow stripes. Its larva feeds on passion flowers.

MILKWEED BUTTERFLIES Family Danaidae Pl. 9
 Identification: Large brownish butterflies, usually marked with black. Similar to Nymphalidae (p. 226) but 3A present in FW, discal cell in HW closed by a well-developed vein, and antennae without scales.

Our most common danaid is the Monarch (Pl. 9), *Danaus plexippus* (Linn.), which occurs throughout the U.S. and Canada. The Viceroy (Nymphalidae) is very similar, but is slightly smaller and has a black line across the hind wing. The Monarch is one of the few butterflies in this country that migrate; it migrates south in fall, often in immense aggregations, and reappears in the North the following spring. The Monarchs appearing in the North are usually not the same individuals that migrated south the season before, but their offspring; the insect reproduces on its wintering ground or after a short northward flight in spring. Larvae of danuids feed on milkweed.

Skippers: Superfamily Hesperioidea

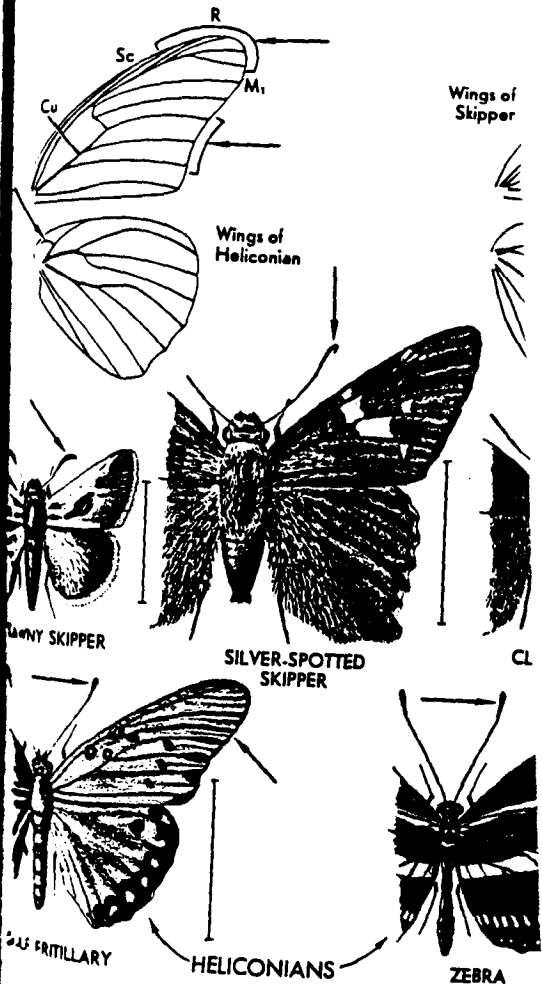
Antennae *clubbed and usually also hooked at tip*, and widely separated at base. R in FW *5-branched*, all branches coming off discal cell. Relatively stout-bodied. Strong fliers. Larvae *generally* pupate in a cocoon formed of leaves and silk.

COMMON SKIPPERS Family Hesperidae
 Identification: Head about as wide as or wider than thorax. Hind tibiae usually with 2 pairs of spurs. Wingspread generally less than 30 mm. Widely distributed.

This is a large group and many species are quite common. The front and hind wings at rest are often held at a slightly different angle. Larvae feed on leaves, and usually live in a shelter formed of a rolled-up leaf or several leaves tied together. They are smooth-bodied, with a small and necklike prothorax.

GIANT SKIPPERS

GIANT SKIPPERS Family Megathymidae
 Identification: Head narrower than thorax, hooked at tip, but with a large club. Hind pair of spurs. Wingspread 40 mm. or more.
 Giant skippers are fast-flying insects that vertical at rest. They occur in the South a bore in stems and roots of yucca and related p



HEMIPEPLID BEETLES Family Hemipeplidae **Not illus.**
Identification: Very elongate, slender, parallel-sided, distinctly flattened. Yellow to yellowish brown. 8-12 mm. Similar to Cucujidae (p. 176) but 3rd tarsal segment lobed and front coxal cavities closed behind.

This family is represented in the U.S. by 2 species, found in Florida, Georgia, and California. They are not common.

Superfamily Meloidea

Tarsi 5-5-4. Usually moderate-sized and soft-bodied.

BLISTER BEETLES Family Meloidae **See also Pl. 6**

Identification: Shape distinctive: usually elongate, slender (a few are oval or round), pronotum *narrower than FW*, head *broad, usually wider than pronotum*. Body soft, often leathery. FW loosely covering abdomen, rarely shortened. Antennae thread-like or beadlike, intermediate segments sometimes modified. Legs long, slender. Black or brown, sometimes brightly colored, often with light pubescence. 3-20 (usually 10-15) mm.

Blister beetles are common insects occurring on the flowers and foliage of various plants. The name "blister" beetles is based on the fact that the body contains cantharidin, a substance capable of blistering the skin. This chemical is extracted from the body of certain species and used medicinally. Adult blister beetles are plant feeders, and some are serious pests of potatoes, tomatoes, beets, clover, and other plants. They may completely defoliate a plant. Larvae are parasitic and generally beneficial; they usually feed on grasshopper eggs, but some feed on eggs or larvae of bees. Larvae that parasitize bees climb onto flowers and attach themselves to bees visiting the flowers. The bees then carry these larvae to their nest, where the larvae attack the bee eggs. Meloid larvae undergo hypermetamorphosis (in which the various larval instars are quite different in form): the 1st instar is long-legged and active, whereas following instars are grublike or maggotlike. Members of the genus *Meloe*, which are rather large and black or bluish, have very short, overlapping front wings (elytra); they are called oil beetles because they exude an oily substance from the joints of the legs when disturbed; this substance can raise blisters on one's skin.

WEDGE-SHAPED BEETLES Family Rhipiphoridae
Identification: Elongate, humpbacked, wedge-shaped, similar to Mordellidae but abdomen *blunt*, not pointed. Antennae *pectinate* or flabellate in ♂, serrate in ♀. FW entire or *short, pointed*. Usually black and orange. 4-15 mm.

Adults generally occur on flowers but are not common. Larvae are parasitic on wasps, bees, and cockroaches; they undergo hypermetamorphosis (see p. 41). Some females are larviform.

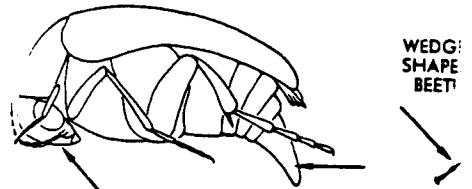
Superfamily Mordelli

Unique in shape, and in behavior when caught.

TUMBLING FLOWER BEETLES Family Mordellidae

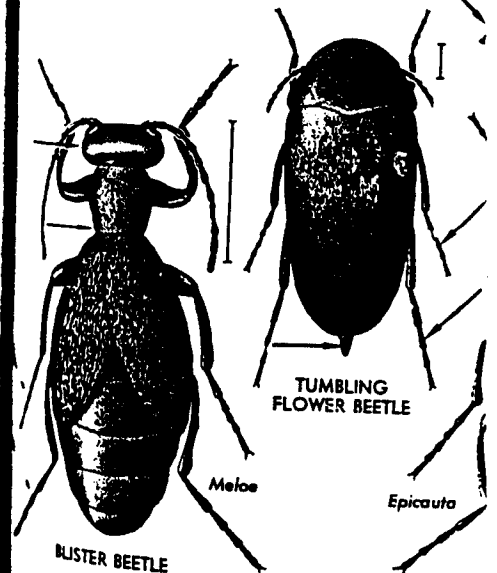
Identification: Humpbacked, wedge-shaped, *situated ventrally*. Abdomen *pointed* and usually blackish or gray, sometimes *ventrally* pubescent. Antennae short, thread-like. Tarsi 5-5-4. 1.5-15.0 (usually 3-7) mm.

Mordellids are common on flowers; they captured tumble about in a comical fashion, making them difficult to catch, since they run rapidly.



Side view of Tumbling Flower Beetle

WEDGE-SHAPED BEETLE



TUMBLING FLOWER BEETLE

BLISTER BEETLE