

**ENDANGERED**  
and Sensitive Species  
of the San Joaquin Valley, California



**ENDANGERED  
AND SENSITIVE SPECIES**

**OF THE  
SAN JOAQUIN VALLEY, CALIFORNIA**

**THEIR BIOLOGY, MANAGEMENT AND CONSERVATION**

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Species Facing Proximate Threats,  
Immediacy Uncertain

*Buena Vista Lake Shrew*

The Buena Vista Lake shrew formerly occurred in wetlands around historic Buena Vista Lake and presumably in areas of dense vegetation along streams and sloughs throughout the Tulare Basin (Grinnell 1932b 1933, Williams 1986). As early as 1933, Grinnell found the distribution of this species to be much restricted due to the disappearance of lakes and sloughs. Since Grinnell's (1932b) report, Buena Vista Lake and the surrounding lakes and marshes have been drained and cultivated. Further, canals in the area are steep-sided and kept free of vegetation.

Currently, this shrew is known only from wet areas with tree or shrub cover around Gator Pond on The Kern Lake Preserve administered by The Nature Conservancy (Freas 1990, unpubl. data). Its main threats continue to be habitat loss to cultivation and lack of fresh water to maintain wetlands.

The most immediate needs are for surveys of Buena Vista Lake shrews to determine distribution, population status, and threats to remaining populations. Populations may occur in Kern National Wildlife Refuge and the adjacent wetlands, but may not be of the *relictus* subspecies. Its questionable taxonomic status (S. George, pers. comm.) also should be resolved.

*Short-nosed Kangaroo Rat*

This species occurred along the west side of the San Joaquin Valley from near Los Banos to the southern end of the valley in the Panoche, Sunflower, and Cuyama valleys and on the Antelope, Elkhorn, and Carrizo plains. Short-nosed kangaroo rats typically occupy grassland and desert-shrub associations dominated by saltbush, eastwoodia, ephedra, snakeweed, burrobush, desert thorn, or others, and characterized by flat or gently sloping terrain or hilltops with friable soils.

They also occur in areas of saline and alkaline soils supporting communities dominated by species of saltbush, iodine bush, and seablite such as those around Soda Lake on the Carrizo Plain. They are found on steep, rocky slopes on the western side of the Temblor Mountains along the edge of the Elkhorn Plain that support some of the shrubs listed above, buckwheat (*Eriogonum*), winterfat, chaparral yucca (*Yucca whipplei*), and other perennial species (Williams and Tordoff 1988, unpubl. data). On the valley floor, around Los Banos, Merced County, small populations structurally intermediate between the Fresno kangaroo rat and the short-nosed kangaroo rat live on dikes secure from winter flooding, then move into seasonally flooded iodine bush shrublands during the summer. Hawbecker (1951) reported that populations of this species in the Panoche Valley were found on gentle slopes and rolling low hilltops where some shrubs were present. Light to moderate grazing probably enhances habitat for this species, but heavy grazing may be detrimental (Williams et al. 1989).

Populations of short-nosed kangaroo rats once considered secure because of extant habitat have declined or disappeared, and areas presumed to support viable populations have been found to have no extant colonies. Thus, the sizes and number of populations of this subspecies are smaller and fewer than were thought previously (Williams 1986).

Of primary concern are loss of habitat to agriculture and degradation of habitat due to livestock overgrazing. The lack of lands dedicated to preserving natural communities within most of the range of these kangaroo rats means that loss and degradation of habitat probably will continue in the future.

Detailed information is needed most on the distribution and population status of this taxon. Further, information is needed on the impact of grazing on remaining populations to be used in determining grazing leases. Land-use projections within areas still inhabited by short-nosed kangaroo rats should be reviewed, and the USFWS and

Bureau of Land Management (BLM) should include habitat needs for this species when formulating management plans for areas within its geographic range. Finally, CDFG should review options with BLM to buy and develop, as preserves, lands in northwestern Fresno and eastern San Benito counties in the Panoche Valley area.

#### *Salinas Pocket Mouse*

The Salinas pocket mouse occurs in the Salinas Valley from near Soledad southward to Hog Canyon. Its taxonomic relationships to populations on the Carrizo Plain, the Cuyama Valley, and the upper Salinas River watershed are uncertain (Williams 1986). Typically inhabiting fine textured sandy soils, it may occur on other substrates in annual grassland/desert shrub communities, especially where plant cover is not dense and soils are friable.

No extant populations of Salinas pocket mice have been located in the Salinas Valley in recent years, but little field work has been carried out there. Most natural communities have been developed, and areas where this species may still occur are privately owned or are military bases, making access for surveys difficult.

The primary cause for concern for this species is habitat loss to cultivation and urban development. Information on the location and status of extant populations is urgently needed. Immediate efforts to locate populations and preserve suitable habitat in the Salinas Valley should be made. Further, studies should be carried out on and in the vicinities of Camp Roberts, Fort Hunter Liggett, and Fort Ord military reservations in San Luis Obispo and Monterey counties. Finally, systematic relationships to populations of San Joaquin pocket mouse (*P. i. inornatus*) and McKittrick pocket mouse (*P. i. neglectus*) must be determined before proposals for its protection can be formulated.

#### *Tulare Grasshopper Mouse*

The Tulare grasshopper mouse historically ranged from about western Merced and eastern San Benito counties south to the Tehachapi Mountains; on the east, they ranged from Madera County south (Newman and Duncan 1973, unpubl. data). Currently, they occur across the floor of the Tulare Basin, and continuous areas to the west in the hills along its western boundary, including the Carrizo and Elkhorn plains and the Panoche Valley.

Southern grasshopper mice (*O. torridus*) typically inhabit desert shrub communities in hot, arid Lower Sonoran associations. We have little information about the habitat requirements of the Tulare subspecies. Habitats recorded in the literature include blue oak savanna at 450 m, where it is very rare (Newman and Duncan 1973), and desert associations consisting of annual grasses and the shrubs California ephedra, San Francisco snakeweed, narrowleaf goldenbush (*Haplopappus linearifolius*), and California buckwheat (*Eriogonum fasciculatum*) (Hawbecker 1951). Other reported habitats are alkali-sink, dominated by one or more saltbushes, iodine bush, seablite, and alkali goldenbush; mesquite (*Prosopis juliflora*) associations on the valley floor; saltbush scrub; Upper Sonoran shrub associations dominated by California ephedra/Anderson desert thorn; and grassland associations (principally Arabian schismus and red brome) on the sloping margins of the San Joaquin Valley and the Carrizo Plain region (Williams and Tordoff 1988, unpubl. data). We have captured Tulare grasshopper mice on the Elkhorn Plain and in the Panoche Mountains up to elevations of 793 m (2,600 ft).

The Tulare grasshopper mouse is the rarest species of rodent in the San Joaquin Mammalian Faunal Region. Although apparently widespread, it is nowhere locally abundant, and is poorly represented in research collections. Thus, its population status remains uncertain. That this taxon

faces a proximate threat of extinction is indicated by two lines of evidence. First, the species with which it is commonly associated (giant kangaroo rat, Tipton kangaroo rat, San Joaquin antelope squirrel, and San Joaquin kit fox) are all jeopardized to some extent. Second, the low fecundity, low population density, and large home range characteristic of southern grasshopper mice (McCarty 1975) make this subspecies particularly vulnerable to loss and fragmentation of habitat. Habitat loss to cultivation is the most serious threat to Tulare grasshopper mice.

Studies should be undertaken to document the current distribution and abundance of Tulare grasshopper mice, and to determine basic aspects of their ecology such as habitat requirements, demographics, and social structure. This information is needed before detailed recommendations can be made. The following list includes records from the literature, our unpublished records (DFW), and three research collections. Other collections have not been canvassed for records of this subspecies.

Museum acronyms are: CM - Carnegie Museum of Natural History; MVZ - Museum of Vertebrate Zoology, University of California, Berkeley; USNM - U.S. National Museum of Natural History (Choate and Genoways 1975).

#### Distribution Records for Tulare Grasshopper Mouse

*Fresno County.* Alcalde, 1 (USNM); Coalinga, 1 (USNM); 10 mi SW Fresno (Culbertson 1946); Huron, 2 (USNM); Little Panoche Creek, 1 (USNM); 5 mi W Kerman (Culbertson 1946); Bench Mark 503, 19 mi SW Mendota, 3 (MVZ); 4 mi E Mercy Hot Springs, 2,000 ft, 1 (CM); near junction Panoche and Silver Creeks, 650 ft, 1 (MVZ); N bank Panoche Creek near confluence with Silver Creek, sec. 20, T15S, R12E (DFW); 1 mi SW Bench Marker 502, Panoche Creek, 600 ft, 1 (MVZ); 6 mi E Panoche, 1,400 ft, 2 (MVZ); Panoche Mountains, T14S, R11E, 2,000 ft, 1 (CM); Stanley, 2 (USNM).

*Kern County.* Bakersfield, 2 (USNM); 20 mi S, 8 mi W Bakersfield, 450 ft, 2 (MVZ); mouth Caliente Creek Wash, 600 ft, 3 (MVZ); Delano, 1 (USNM); Famoso, 1 (USNM); McKittrick, 1,111 ft, 1 (MVZ); 2 mi N McKittrick, 700 ft, 1 (MVZ); 2 mi N, 2 mi E McKittrick, 1 (MVZ); Weldon, 2,650 ft, 3 (MVZ); west slope, 5,000 ft, at head of Kelso Valley, 16 mi SSE Weldon, 1 (MVZ).

*Kings County.* 15 mi S Corcoran, 3 (MVZ).

*Madera County.* San Joaquin Experimental Range (Newman and Duncan 1973).

*San Benito County.* near junction Idria Road and Silver Creek (Hawbecker 1945); 2 mi NNE New Idria, 1,900 ft, 4 (MVZ); 5 mi E Panoche, 1,200 ft, 1 (MVZ); approximately 6 mi E Panoche (Hawbecker 1951); 4.5 mi E, 1 mi N Panoche (Tappe 1941); Panoche Creek, 2 mi SE Panoche, 1,200 ft, 8 (MVZ); 11 mi E Llanada, Panoche Pass, 2 (MVZ).

*San Luis Obispo County.* Carrizo [Carrizo] Plains, 1 (USNM); Carrizo Plain, sec. 18, T31S, R21E (Braun 1983); Carrizo Plain, sec. 34, T12N, R26W, 2,050 ft, 1 (CM); Elkhorn Plain Ecological Reserve, sec. 20, T32S, R22E, 2,400 ft (DFW); Santiago Springs (USNM); Santiago Spring, 2,600 ft, 4 (MVZ); Santiago Springs, 2 (USNM); Santiago Spring, 2,700 ft, 8 mi E, 1.5 mi S Simmler, 1 (MVZ); 11 mi W Simmler, 1 (MVZ).

*Tulare County.* Alila [Earlimart], 1 (USNM).

#### Species Not Currently Considered Jeopardized

##### *San Joaquin Myotis*

*Myotis yumanensis oxalis* occupies areas on the valley floor and foothills of the San Joaquin Basin and Delta, westward to at least Berkeley, Alameda County (Hall 1981). Within its range, it is among the commonest of bat species. These bats form relatively large maternity colonies in attics, barns, and other structures. Populations of all bats appear to have diminished greatly in the last two decades in central California, and this trend probably will continue as more land is developed, more insecticides are used, and as barns and other structures used as roosts and sites for maternity colonies become less numerous. While the species probably does not warrant higher priority consideration now, treatment as a sensitive species is advisable.

##### *San Joaquin Black-tailed Hare*

*Lepus californicus richardsoni* occupied the Tulare Basin floor and lower slopes of the adjacent mountains, and the Carrizo Plain and upper Salinas River watershed. It ranged from the valley floor, at about 60 to 900 m or more in the hills around the valley (Orr 1940). In central California, the black-tailed hare is common only in the annual grassland and desert shrubland communities be-

low about 400 m, but it ranges widely in the foothills and in agricultural areas. At the San Joaquin Experimental Range, Madera County, at about 460 m, the black-tailed hare was rare in the blue-oak savanna, based on periodic studies over a 50-year period (Newman and Duncan 1973). At lower elevations in the oak savanna/chaparral community in Kings Canyon-Sequoia National Park, the black-tailed hare is rare, no animals having been recorded by park personnel for the last several decades (D. M. Gerber, pers. comm.). The black-tailed hare, in general, inhabits open grassland and shrubland communities. Dense chaparral and closed forests are unoccupied. It requires cover for hiding during the day; scattered desert shrubs and thickets of willows or other woody shrubs along water courses fill this need. It adapts to some types of irrigated croplands if cover and food are available. Although no specific information is available on its status, it is not considered threatened because of its adaptability, high fecundity and vagility, and the broad range of plant communities inhabited.

#### *Carrizo Plain Pocket Gopher*

The geographic range of *Thomomys bottae infrapallidus* is poorly documented in the literature. Specimens are known from the type locality, 7 mi SE Simmler, and from 5 mi N Painted Rock, Carrizo Plain, San Luis Obispo County, California. According to Grinnell (1933), it ranges between about 580 and 610 m, living in fine-grained alkaline soils of level, open ground. It probably ranges over most or all of the Carrizo and Elkhorn plains, intergrading with other subspecies in the Temblor and Caliente ranges and in the San Juan Creek drainage north of the Carrizo Plain. No specific information on the ecology and population status of the Carrizo Plain pocket gopher is available, but based on observations of other subspecies, there probably is little cause for concern. Habitat loss to dryland cultivation of the most friable soils on the Carrizo Plain has been extensive, but much remains along the edges of the

Carrizo Plain and on the Elkhorn Plain, and much of the cultivated ground is now fallow and will remain so indefinitely. Pocket gophers also adapt well to most types of irrigated cropland and dryland pasture. The greatest threat may stem from long-term overgrazing by cattle and the consequent soil erosion and degradation of the plant community.

#### *Buena Vista Lake Pocket Gopher*

*Thomomys bottae ingens* is limited to areas near historic Buena Vista Lake, in the southern San Joaquin Valley, Kern County (Hall 1981). Buena Vista Lake has been drained and is under irrigated cultivation. Cotton is grown on the historic lake bed and on most surrounding farms. A segment of its historic range is now a recreation area and golf course. Periodic field work, especially in 1985 (Williams 1985), produced evidence of extant colonies in the South Coles Levee Oil Field and the Buena Vista Lake Recreation Area north of the lake bed, and elsewhere within its limited geographic range. Given the ability of pocket gophers to adapt to golf courses and to pastures and fields in perennial crops such as alfalfa, we do not consider this taxon to be actively threatened at this time.

#### *San Joaquin Pocket Mouse*

Taxonomic problems in this species complex have complicated the resolution of the population status of *Perognathus inornatus inornatus*. Currently, the boundaries between the geographic ranges of this subspecies, *P. i. neglectus*, and the population from the Sacramento Valley are not well documented. Typical habitat for the San Joaquin pocket mouse includes areas with friable soils in grasslands and blue oak savannas, from near sea level to about 458 m (1,500 ft) in elevation. The oldest and largest collections, made near the beginning of the century, were from areas of wind-drifted and stream-deposited sand, a habitat that has essentially disappeared due to cultiva-

tion and urban development. Although this taxon may not be immediately threatened by extensive loss of habitat in the San Joaquin Valley, it should be treated as sensitive until its population and taxonomic status can be determined.

#### *McKittrick Pocket Mouse*

*Perognathus inornatus neglectus* occurs along the western side of the San Joaquin Valley, in the Mojave Desert, on the Carrizo Plain, and in the upper Salinas Valley. Its distributional limits and taxonomic relationships to other *inornatus*-group pocket mice are unclear. McKittrick pocket mice have been taken on a wide spectrum of soil textures in desert shrub and grassland associations supporting saltbush, California ephedra, and annual herbaceous plants such as brome, filaree, Arabian schismus, and fescue (*Vulpia* spp.). They are most frequently found in or near the sandy soils associated with arroyos. Most of the available habitat for this mouse is on the sloping western margin of the San Joaquin Valley and the adjacent, rugged hills. This subspecies seems only locally common, but probably is not under current serious threats. Nonetheless, its population and taxonomic status should be resolved.

#### *Merced Kangaroo Rat*

*Dipodomys heermanni dixonii* is known from eastern Merced and Stanislaus counties (Hall 1981) in grassland and savanna communities. Although locally abundant, this subspecies has a limited distribution in this part of the San Joaquin Valley. Further, the rapid rate of conversion of native plant communities to irrigated fields, orchards, and vineyards give cause for concern about its future status. It should be treated as sensitive until its status is clarified.

#### *Carrizo Plain Kangaroo Rat*

*Dipodomys heermanni swarthi* occupies the upland desert and steppe communities of the

Carrizo and Elkhorn plains and the upper Cuyamaca Valley, and both sides of the Temblor Range; apparently intergrades genetically with the Tulare kangaroo rat (*D. heermanni tularensis*) along the eastern flank of the Temblor Range (Grinnell 1922, 1933). Within this area, it occupies a variety of plant communities from level ground to steep slopes. Because of its ability to live on steep, arid, rocky slopes, there is no cause for concern about its population status.

#### *Tulare Kangaroo Rat*

*Dipodomys heermanni tularensis* is found in the more arid portions of the San Joaquin Valley, ranging through the grassland, shrubland, and savanna communities from the San Joaquin Delta on the northwest, southward to the foothills of the Tehachapi Range, and on the east from Madera County south. It uses a broader range of plant communities and soil types than do the other species of kangaroo rats in the San Joaquin Valley. It occupies all communities, from alkali-sink shrublands on the valley floor, to blue oak-digger pine savanna and woodlands in the foothills, extending to about 1,200 m in the mountains of the Diablo Range (Hall 1981, Tappe 1941). The Tulare kangaroo rat is common on steep, shrubby, and rocky slopes in arid grassland and desert shrub communities (Hawbecker 1951). Although cultivation on the valley floor has destroyed habitat over an extensive portion of its geographic range, it is common in remnants of natural communities and some fallow ground on the valley floor. Further, its ability to inhabit a wide range of plant communities lessens the threats and insulates the subspecies from jeopardy.

#### *Buttonwillow Weasel*

*Mustela frenata pulchra* is known from arid alkali-sink, grassland, and desert shrub communities in the Tulare Basin, Kern River Basin, and Carrizo Plain (Hall 1981). It ranges from near Coalinga, Fresno County, on the northwest and

Earlismart, Tulare County, on the northeast, southward to the Tehachapi Range. Buttonwillow weasels were probably most numerous in communities supporting high densities of voles, pocket gophers, or kangaroo rats. Like other subspecies of the long-tailed weasel, they probably adapt well to irrigated pasture and other croplands where pocket gophers or voles are common. Because of this, and because of their broad prey base, there is no known cause for concern about their population status.

#### *Yellow-cheeked Weasel*

*Mustela frenata xanthogenys* is distributed throughout most of the grassland and savanna communities of the San Joaquin Basin, extending also into the Delta region and the lower Sacramento Valley. Marginal records listed by Hall (1981) for yellow-checked weasels and adjacent subspecies in the coastal valleys and ranges (*M. f. nigriauris*) and the western slope of the Sierra Nevada (*M. f. nevadensis*) do not clarify the extent of its distribution in the foothill shrub and woodland communities along the margins of the valley. Regardless, this weasel adapts well to some types of cultivated agriculture where pocket gophers or voles are plentiful. Thus, cultivation and degradation of natural communities on the valley floor pose a lesser threat to weasels than to those species entirely dependent on natural communities. There is no known reason to consider this subspecies to be threatened.

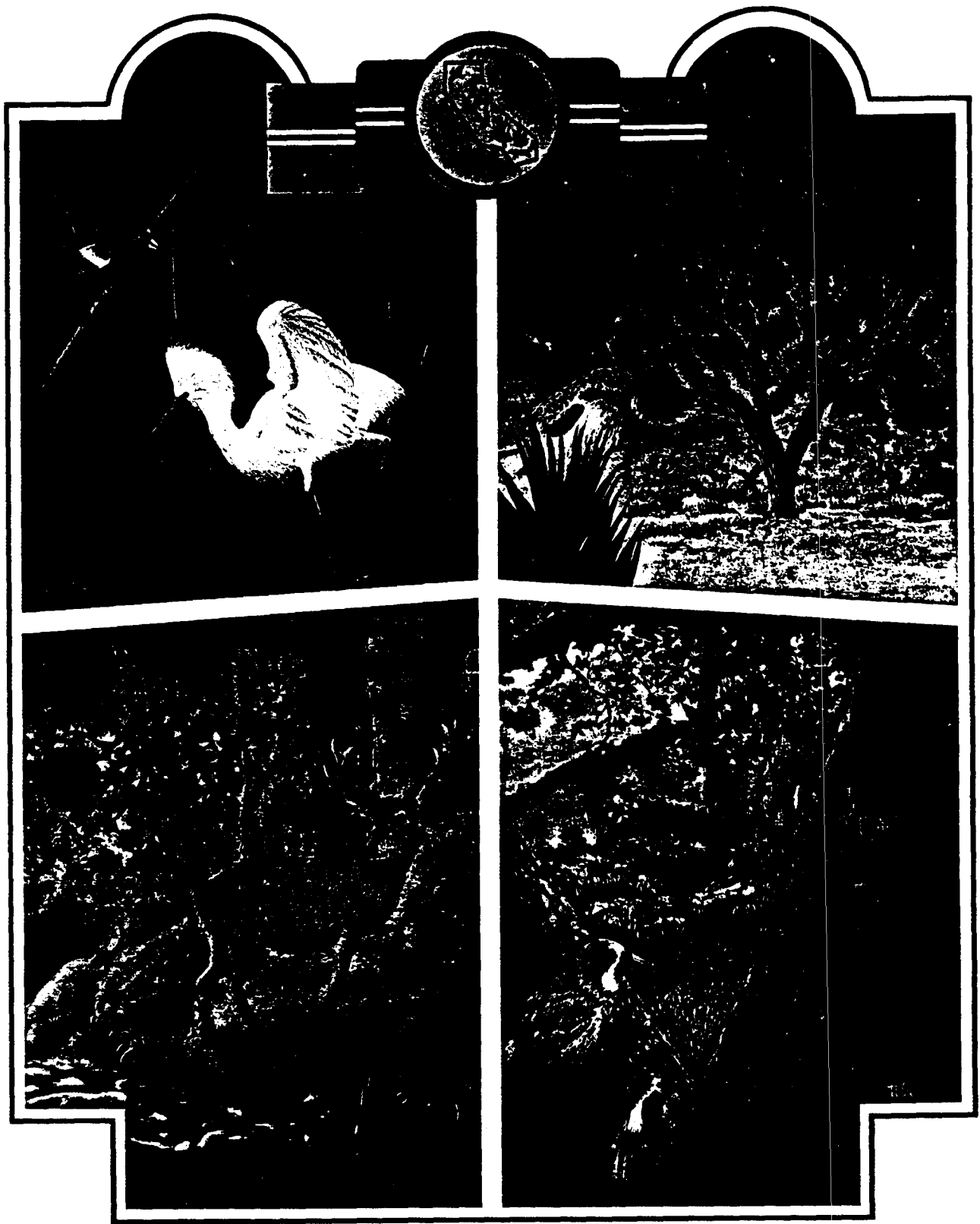
#### DISCUSSION AND CONCLUSIONS

The mammalian fauna of the San Joaquin Valley region consists mainly of species adapted to arid grassland and desert and those that also range more widely in woodland, chaparral, and riparian communities. Endemics comprise 19% (22 of 116) of the taxa living in communities below about 915 m in elevation. Of the 22 endemics, only 3 are confined to riparian or wetland communities. The other 19 are confined to, or characteristic of, arid grassland and desert communities.

The emphasis in the species accounts was placed on the population status and potential threats to individual species endemic to the San Joaquin Mammalian Faunal Region. State and federal legal protection should be sought for the riparian brushrabbit and riparian woodrat, species for which information is adequate to establish their endangered status. While listing focuses concern on individual species and provides a measure of protection, listing as threatened or endangered probably is not the most efficient and cost-effective way to ensure survival of these and other species.

Clearly, the major threat to San Joaquin mammals is loss and degradation of habitat. Thus, the highest conservation priority should be the preservation of those habitats most in danger of irrevocable loss and degradation. Preservation of the mammalian species discussed here, other species already protected under state or federal statutes, and unprotected species can best be accomplished by concentrating conservation efforts on their biotic communities instead of emphasizing single species management. Because so many of these mammalian species occur together, we believe the best approach to their protection is the establishment of "macropreserves": large blocks of natural communities in several target areas. In the San Joaquin Mammalian Faunal Region, these target communities are desert scrub, alkali-sink/valley-floor mesquite and saltbush shrublands, alkaline grasslands, riparian forest, and wetlands. Extant natural areas should be inventoried, classified by quality, size, sensitive species values, and ownership, and ranked for acquisition and preservation such as is being done by the California Energy Commission for the southern San Joaquin Valley. By focusing efforts on maintaining natural communities, we believe that the chances of preserving sensitive species can be greatly increased at far less cost than would be incurred by a single species approach. Moreover, such an approach provides security to members of natural communities that are not normally accorded protected status, but may be essential to the perpetuation of





# CALIFORNIA'S WILDLIFE

VOLUME I

AMPHIBIANS AND REPTILES

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## **VOLUME I**

### **AMPHIBIANS AND REPTILES**

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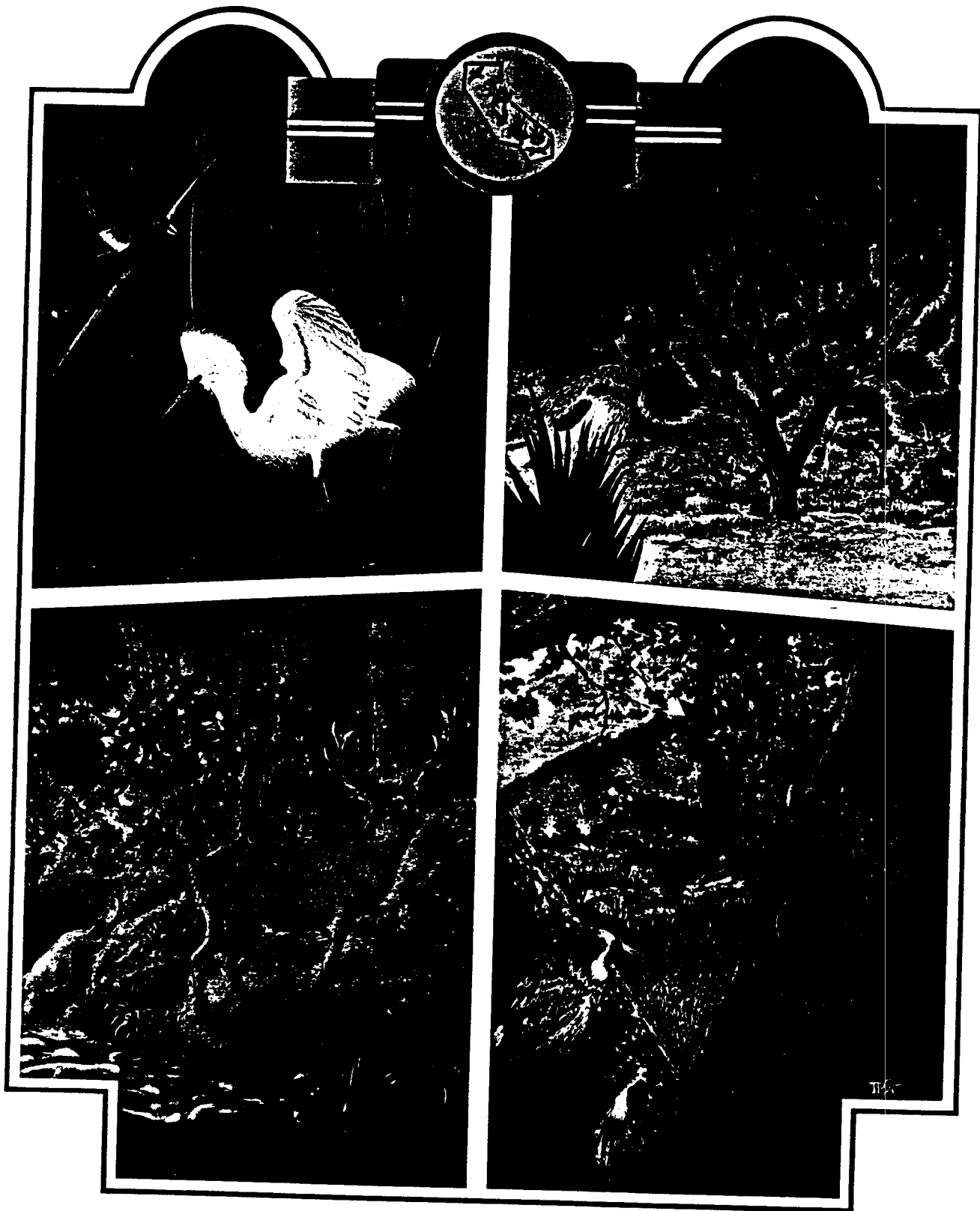
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California Statewide Wildlife Habitat Relationships System

State of California  
The Resources Agency  
DEPARTMENT OF FISH AND GAME  
Sacramento, California

May 2, 1988



# CALIFORNIA'S WILDLIFE

VOLUME II

BIRDS

# CALIFORNIA'S WILDLIFE

## VOLUME II

### BIRDS

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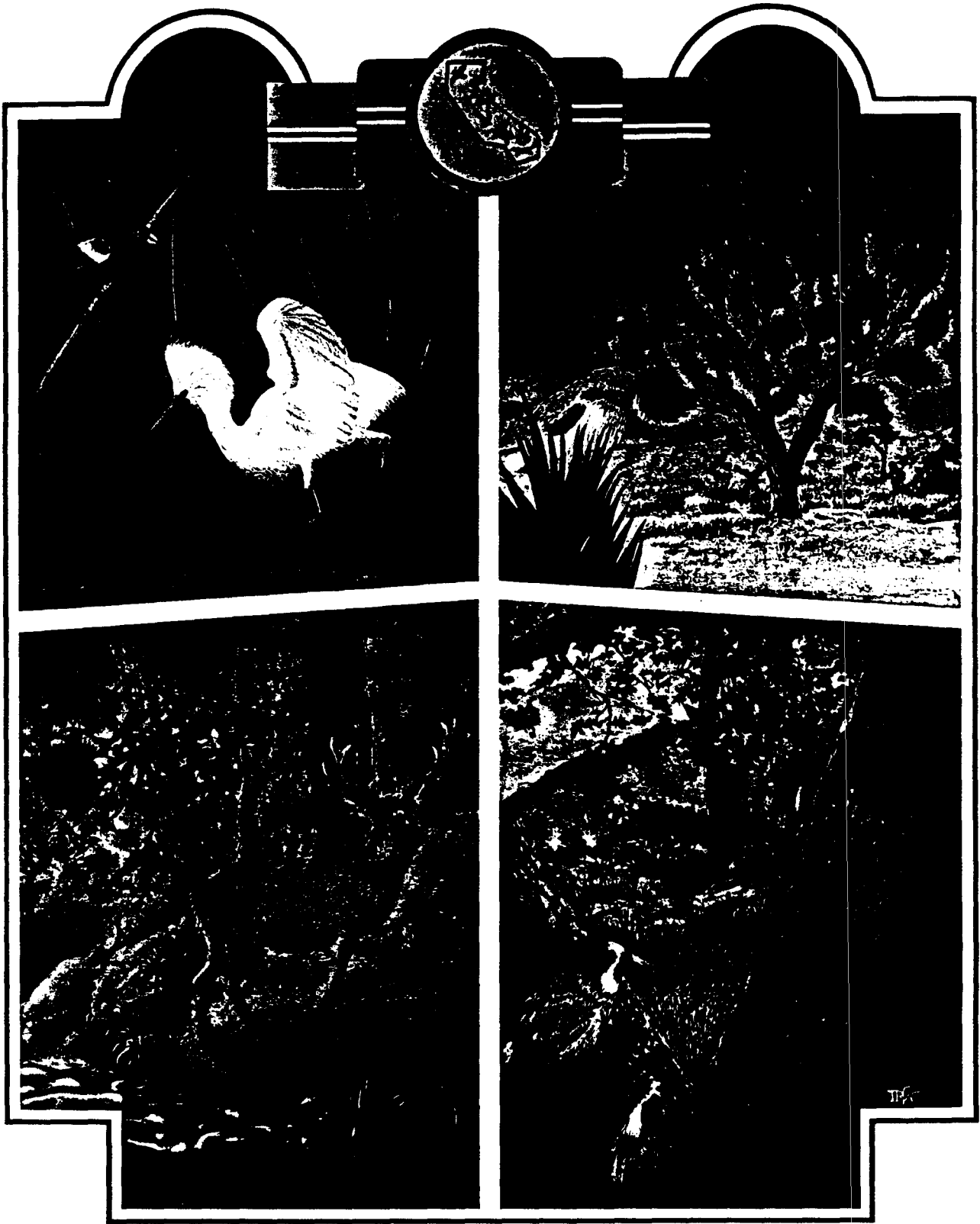
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November, 1990



# CALIFORNIA'S WILDLIFE

VOLUME III  
MAMMALS

# CALIFORNIA'S WILDLIFE

VOLUME III

MAMMALS

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California Statewide Wildlife Habitat Relationships System

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Sacramento, California

April 1990

# M112 Beaver *Castor canadensis*

Family: Castoridae Order: Rodentia Class: Mammalia  
Management Status: Harvest Species Date: October 19, 1983

## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Found in streams, ponds, and lake margins in eastern Sierra Nevada and Cascades from Modoc Co. south to Inyo Co., in the northern mountains west to Del Norte Co., and in Central Valley south to Fresno Co. Isolated populations occur in San Bernardino, Riverside, Imperial, San Diego, San Luis Obispo, Monterey, Mendocino, Lake, and Napa cos. Once native to Central Valley and drainages of Colorado, Klamath, and Pit rivers, but decimated by trapping. Subsequently re-established, and introductions have extended original range. Optimum habitats include montane riparian, valley foothill riparian, riverine, lacustrine, aspen, and fresh emergent wetland. Feeds in a variety of other habitats, including valley foothill hardwood, montane hardwood-conifer, mixed conifer, red fir, Douglas-fir, montane chaparral, annual and perennial grasslands, and wet meadow (Grinnell *et al.* 1937, Tappe 1942, Hall 1960, Jenkins and Busher 1979).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** In spring and summer, prefers grasses, leaves, and aquatic vegetation, such as tules, cattails, and pond lilies. In winter, subsists on bark and cambium of trees. In California, aspen, willow, alder, and cottonwood are preferred. Forages mostly on or near streambanks, felling trees and harvesting branches for winter food. Forages up to 200 m (650 ft) from water. Stores branches in lodge or on pond bottom, held in place by mud. Colony members forage independently (Brady and Svendsen 1981). Cuts a variety of tree sizes, but tends to take smaller trees when foraging far from water (Jenkins 1980). Food preferences vary seasonally. In Sierra Nevada, prefers aspen, taking more willow as aspen is depleted (Hall 1960).

**Cover:** Retreats into water to avoid disturbance and predators, and constructs dams, where possible, to form ponds. Lodges and bank burrows constructed for shelter. May construct canals to feeding areas, providing cover while traveling.

**Reproduction:** Builds lodges out of branches and mud, or burrows in muddy banks. The lodge can be 1.8 m (6 ft) high and up to 12 m (40 ft) wide. Kits born in a nest inside lodge or burrow, which have underwater entrances.

**Water:** Semiaquatic; requires permanent water for reproduction, cover, and riparian and aquatic plant food.

**Pattern:** Requires permanent, preferably deep, water in rivers, streams, lakes, or ponds, in open to moderately dense riparian forest. In Central Valley, primarily a bank dweller; often does not construct dams and lodges. In montane areas, typical lodge and dam construction is found. Tends to deplete favored food plants in vicinity of colony after several years (particularly in areas where depends on aspen and willow, rather than aquatic vegetation). As a result, colonies may move up or down stream to unexploited areas. This produces a cyclical pattern of exploitation and renewal of habitat.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, primarily nocturnal activity. Activity begins in late afternoon and may last up to 12 hr per day in spring. In winter, walks over snow to trees, leaving feeding trails. Radio-marked beavers displayed activity rhythms of 26.6 and 29.0 hr; individuals sometimes were asynchronous. Above ice, activity was absent below  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ) and increased with temperature (Lancia *et al.* 1982).

**Seasonal Movements/Migration:** None.

**Home Range:** Lives in colony of 1 adult pair, young of the year, and perhaps a few second-year young. At high density, may be considerable inter-colony movement, and some colonies may have more than 2 adults. Colonies in Canada had a home range of 0.8 km (0.5 mi) radius from lodge, or 201 ha (497 ac) (Aleksiuk 1968). Light (1969) estimated home range of a colony in San Bernardino Mts. at 15 ha (36 ac). Densities typically range from 0.4 to 0.8 colonies per  $\text{km}^2$  (0.4  $\text{mi}^2$ ), and may reach 3 per  $\text{km}^2$  (Jenkins and Busher 1979).

**Territory:** Territories maintained by scent mounds, and were 0.4 km (0.25 mi) radius from the lodge, or 50.3 ha (126 ac) (Aleksiuk 1968). Colonies closer together formed more scent mounds than did more isolated colonies (Butler and Butler 1979). Territorial behavior spaces colonies, but does not prevent depletion of food resources, and starvation in some cases (Bergerud and Miller 1977). Scent mounds may transmit sexual information (Butler and Butler 1979).

**Reproduction:** Monogamous; mates January through February. Second- and 3rd-yr females may mate later than older females. After gestation of 90-128 days, young born, mostly in May and June. Litter size 1-8, average 3-4. Litter size related to weight of mother, available food, and severity of winters. Young born furred, with erupted incisors and eyes partially open. Lactation lasts 60-90 days. Most young disperse in 2nd yr; may breed in 2nd or 3rd yr. Thus outbreeding is the rule, although parent-progeny matings reported (Svendsen 1980). May live 21 yr or more, but most live less than 10 yr.

**Niche:** Has a profound effect on habitat. Feeding and constructing dams and lodges affect species composition and abundance of trees, changes water table, creates meadows and ponds, and thereby affects other wildlife species. Positive and negative effects on fish reported (Hill 1982), and known to affect waterfowl, other birds, and small mammals. Cycle of periodic resource depletion and renewal, coupled with movements, may result in a mosaic of habitats spread over a larger area than that occupied at any time. Effects on many species remain to be determined. Preyed upon by coyotes, bobcats, bears, and mountain lions. Infected by *Giardia* cysts, a potential health hazard to humans (Dykes *et al.* 1980).

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Grinnell *et al.* 1937, Tappe 1942, Hensley 1946, Denny 1952, Townsend 1953, Hall 1960, Gard 1961, Brenner 1967, Aleksiuk 1968, Light 1969, Bergerud and Miller 1977, Pearson 1977, Butler and Butler 1979, Jenkins 1979, 1980, Jenkins and Busher 1979, Dykes *et al.* 1980, Svendsen 1980, Brady and Svendsen 1981, Hill 1982, Lancia *et al.* 1982, Busher *et al.* 1983.

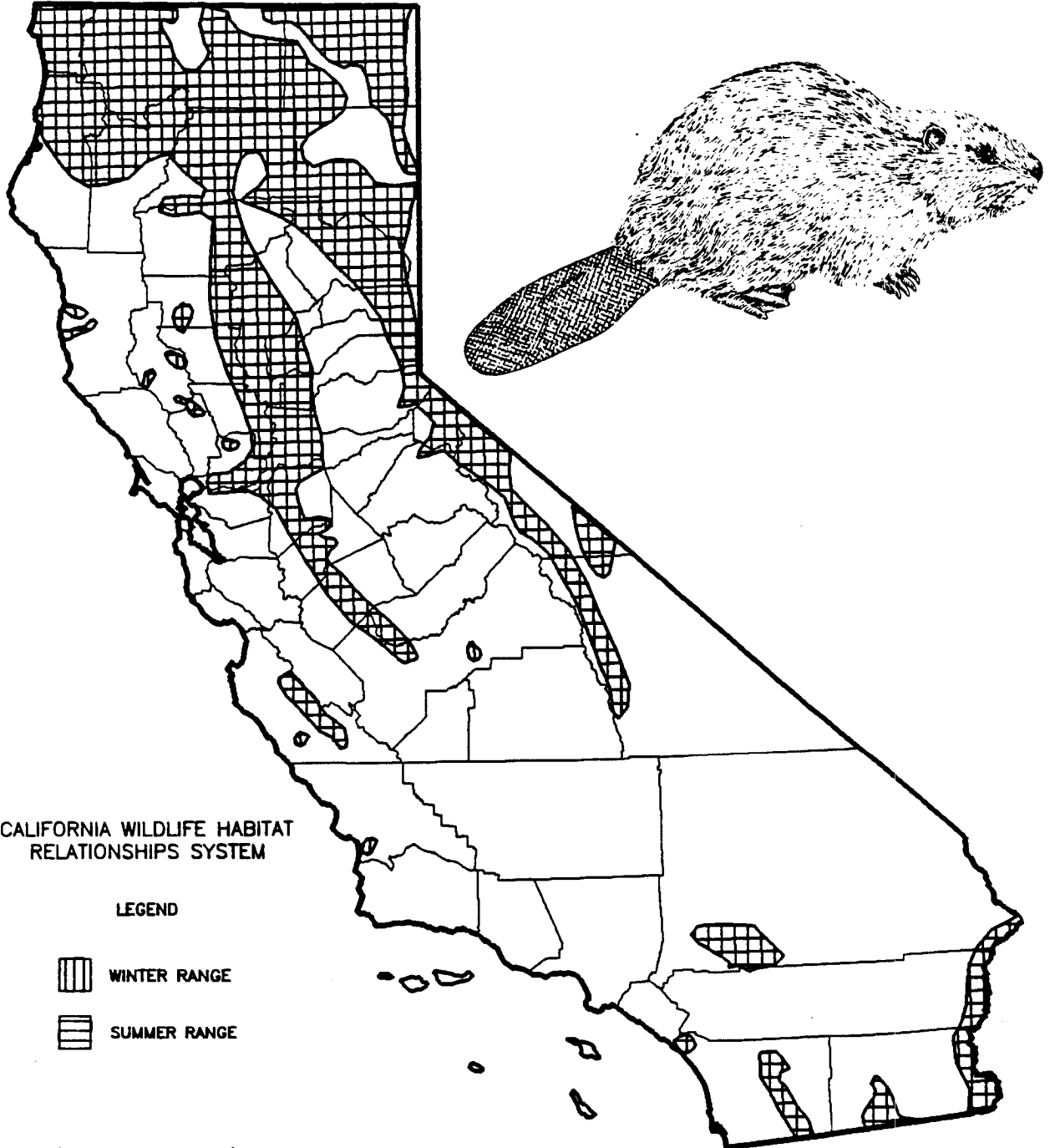
# BEAVER

## AUTHORSHIP

Species Note Prepared By: V. Johnson, J. Harris


Species Note Edited By: S. L. Granholm

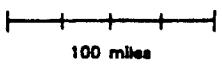
Species Note Reviewed By: H. Shellhammer



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE





# M163 River Otter *Lutra canadensis*

Family: Mustelidae Order: Carnivora Class: Mammalia Date: March 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon, yearlong resident of rivers, large streams, lakes, wetlands, estuaries, and coastal areas. Occurs along river drainages in the North Coast, Klamath, and Cascade Ranges; distribution patchy in the Sierra Nevada (Grinnell *et al.* 1937). The eastern drainages in Alpine, Mono, and Inyo cos., and the Sacramento-San Joaquin drainages and delta also support river otters (Kirk 1975). Numbers greatly reduced by trapping in the past, but increasing under protection (Schempf and White 1977). Most numerous at foothill elevations.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** River otters mostly are carnivorous. Primarily feed on fish, crayfish, and other crustaceans. Also eat amphibians, mollusks, other aquatic invertebrates, carrion, a few mammals and birds, and occasionally fruits, such as blueberries (Toweill 1974). Swim, dig on bottom of watercourses, search and pursue on land to obtain prey. Individuals may hunt alone, or with others (Sheldon and Toll 1964). In Suisun Marsh, crayfish occurred in 98% of 118 scats in 1972-73 (Grenfell 1978).

**Cover:** Cover provided by thickets, tall wetland plants, hollow logs, stumps, snags, and burrows and other cavities.

**Reproduction:** Nest in burrows and cavities in banks, rocks, trees, stumps, in hollow logs, in deserted beaver burrows, in thickets, or on platforms made of wetland plants. Nests lined with dry vegetation, and occur within 0.8 km (0.5 mi) of water.

**Water:** River otters drink water.

**Pattern:** Suitable habitat consists of riparian and other wetland vegetation associated with a large, permanent water source.

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong. Mostly nocturnal but frequent diurnal activity.

**Seasonal Movements/Migration:** Non-migratory, but may travel long distances along watercourses, or even over land in search of a mate, or a new living area.

**Home Range:** Home ranges may extend an average of 24 km (15 mi), or more, along rivers and streams (Haley 1975). Travel distance is highly variable, and related to food supply, suitable habitat, and inherent wandering. May travel 80-96 km (50-60 mi) along rivers and stream during a year (Liers 1951).

**Territory:** No information available. Individuals establish scent posts using their urine, feces, and musk.

**Reproduction:** Most young probably born in March and April in California. Females have postpartum estrus. Gestation period 288-380 days, including delayed implantation (Liers 1951). The single litter per yr averages 2.6 young (range = 1-6). Young weaned in about 4 mo. Female and young remain together 8 mo., or more. Females mature sexually in second yr, but males reported not to breed successfully until 5-7 yr (Maser *et al.* 1981).

**Niche:** Few predators other than humans. Generally do not affect population numbers of game fish; may improve sport fishing because they eat mostly slower, nongame fish.

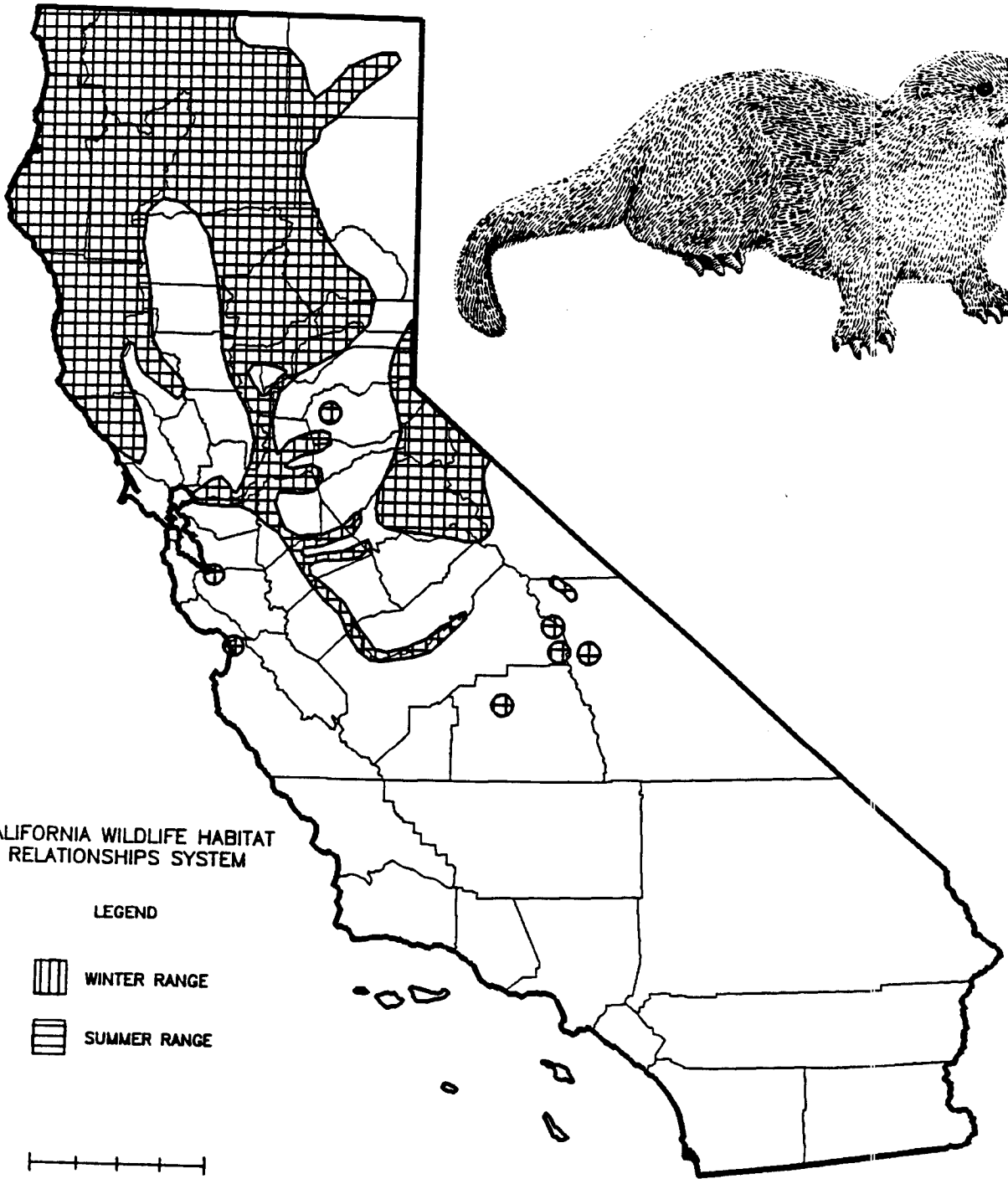
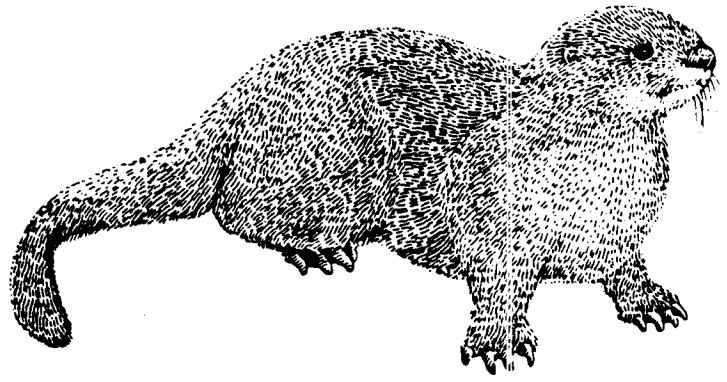
## REFERENCES

Grinnell *et al.* 1937, Liers 1951, Sheldon and Toll 1964, Newberry 1973a, Toweill 1974, Haley 1975, Kirk 1975, Schempf and White 1977, Grenfell 1978, Maser *et al.* 1981.

# RIVER OTTER

## AUTHORSHIP

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Species Note Reviewed By: M. White



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

# M152 Ringtail *Bassariscus astutus*

Family: Procyonidae Order: Carnivora Class: Mammalia

Management Status: California Fully Protected. Date: January 25, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Widely distributed, common to uncommon permanent resident. Occurs in various riparian habitats, and in brush stands of most forest and shrub habitats, at low to middle elevations. Little information available on distribution and relative abundance among habitats (Grinnell *et al.* 1937, Schempf and White 1977).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Primarily carnivorous, eating mainly rodents (woodrats and mice) and rabbits. Also takes substantial amounts of birds and eggs, reptiles, invertebrates, fruits, nuts, and some carrion (Taylor 1954, Trapp 1978). Forages on ground, among rocks, in trees; usually near water.

**Cover:** Hollow trees, logs, snags, cavities in talus and other rocky areas, and other recesses are used for cover.

**Reproduction:** Nests in rock recesses, hollow trees, logs, snags, abandoned burrows, or woodrat nests.

**Water:** Usually not found more than 1 km (0.6 mi) from permanent water.

**Pattern:** Suitable habitat for ringtails consists of a mixture of forest and shrubland in close association with rocky areas or riparian habitats.

## SPECIES LIFE HISTORY

**Activity Patterns:** Nocturnal; active yearlong.

**Seasonal Movements/Migration:** Non-migratory.

**Home Range:** In California, home ranges were estimated to vary from 44-515 ha (109-1280 ac) (Grinnell *et al.* 1937). Average home ranges of 20-43 ha (49-106 ac) were reported for a small number of ringtails in Texas (Toweill and Teer 1981). Also in Texas, densities of 6/km<sup>2</sup> (16/mi<sup>2</sup>) have been reported (Taylor 1954, Toweill and Teer 1981). Density estimated as high as 10.5 to 20.5/km<sup>2</sup> (27.2 to 53.1/mi<sup>2</sup>) in Central Valley (Belluomini 1980, Poglayen-Neuwall and Toweill 1988). Ringtail may be colonial.

**Territory:** No information found. In Texas, home ranges of females were separated widely; home range of males overlapped those of females (Toweill and Teer 1981).

**Reproduction:** Young reportedly often born in May and June (Walker *et al.* 1968). One litter/yr; average of 3 young, range 1-5. Gestation from 40-50 days. Females may drive males away 3-4 days prior to giving birth.

**Niche:** Probable predators include bobcats, raccoons, foxes, and especially large owls. Trapp (1972) discussed the ringtail's adaptation to rough, broken terrain, including naked soles of feet providing traction on smooth surfaces, ability to rotate hindfeet in half circle, dexterous forefeet with limited opposability of first 2 digits, and numerous behavioral adaptations. Potential competition for food exists between ringtails and many sympatric species (e.g., raccoons, gray foxes, coyotes, barn owls, great horned owls, rattlesnakes, gopher snakes).

## REFERENCES

Grinnell *et al.* 1937, Taylor 1954, Ingles 1965, Caras 1967, Walker *et al.* 1968, Trapp 1972, 1978, Schempf and White 1977, Belluomini 1980, Brody and Koch 1981, Toweill and Teer 1981, Poglayen-Neuwall and Toweill 1988.

# RINGTAIL



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Species Note Edited By: M. White  
Species Note Reviewed By: M. White



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

# M165 Mountain Lion *Felis concolor*

Family: Felidae Order: Carnivora Class: Mammalia

Management Status: Harvest Species, *F. c. browni*, California Species of Special Concern

Date: January 26, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Widespread, uncommon permanent resident, ranging from sea level to alpine meadows. Found in nearly all habitats, except xeric regions of the Mojave and Colorado deserts that do not support mule deer populations. Excluded from croplands in the Central Valley (Ingles 1965). Most abundant in riparian areas, and brushy stages of most habitats. Recent studies by the California Department of Fish and Game, and others (see Sitton and Wallen 1976, Koford 1977), suggest that 2500-5000, or more, mountain lions currently live in California. Numbers appear to be increasing.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Carnivorous. Mule deer make up 60-80% of diet throughout year (Currier 1983). Also eat rabbits and hares, rodents, porcupines, skunks, coyotes, and, occasionally, domestic stock. Grouse, turkey, fish, insects, grass, and berries also have been reported in the diet (Spalding and Lesowski 1971, Russell 1978, Currier 1983). Usually stalk prey on ground, often locating by scent. Kill larger prey by stalking within a few meters, and then leaping onto it and biting at base of skull.

**Cover:** Caves and other natural cavities, and thickets in brush and timber provide cover.

**Reproduction:** Caves and other natural cavities, and thickets are used for denning.

**Water:** Apparently capable of existing for long periods without drinking water.

**Pattern:** Require extensive areas of riparian vegetation and brushy stages of various habitats, with interspersions of irregular terrain, rocky outcrops, and tree/brush edges.

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong; mostly nocturnal and crepuscular.

**Seasonal Movements/Migration:** Seasonal movements within a fixed range commonly are in response to prey movements. Follow migrating deer herds.

**Home Range:** Male home ranges usually are a minimum of 40 km<sup>2</sup> (15 mi<sup>2</sup>) (Russell 1978). Female home ranges usually are 8-32 km<sup>2</sup> (3-12 mi<sup>2</sup>). In Idaho, Hornocker (1970)

found home ranges of males varying from 65-250 km<sup>2</sup> (25-96 mi<sup>2</sup>); those of females varied from 13-52 km<sup>2</sup> (5-20 mi<sup>2</sup>). Home ranges of females may overlap completely with those of other females, or with males. However, females with young usually occupy distinct areas (Sitton and Wallen 1976). Males usually occupy distinct areas, and are tolerant of transients of both sexes. Young adults establish home ranges as vacancies occur (Seidensticker *et al.* 1973).

**Territory:** Mountain lions tend to mutually avoid each other, but there is little evidence that they regularly defend a territory (Maser *et al.* 1981).

**Reproduction:** Females may be in estrus at any time of the year, but in California, most births probably occur in spring. Gestation period 82-97 days; litter size 2-4 (range = 1-6) (Currier 1983). In California, weaning occurs in about 8 wk (Bruce 1922), and young become independent during second yr. Some females breed at 2.5 yr, some not until fourth yr. Most females produce litters at 2-yr intervals. Reproduction is limited to the resident male, who breeds the 1 to several resident females whose home ranges overlap his. Transient males usually do not breed until a home range is established. Wild mountain lions probably do not often live longer than 8-12 yr (Young and Goldman 1946).

**Niche:** Few predators other than humans, although large hawks, eagles, and bears may take a few young (Russell 1978). Potential competitors (based on dietary overlap) include bobcats, coyotes, bears, and wolverines (Russell 1978). May carry rabies, *Trichinella* larvae, various tapeworms, and may contract feline panleukopenia. Populations associated closely with deer populations (Nowak 1976). Fragmentation of habitats by spread of human developments and associated roads, power transmission corridors, and other support facilities, restricts movements and increases association with humans. These changes are detrimental to mountain lion populations.

**Comments:** *F. c. browni*, the Yuma mountain lion, is a California Species of Special Concern (Williams 1986). Inhabits Colorado River Valley.

## REFERENCES

Bruce 1922, Young and Goldman 1946, Robinette *et al.* 1961, Ingles 1965, Hornocker 1970, Spalding and Lesowski 1971, Seidensticker *et al.* 1973, Christensen and Fisher 1976, Nowak 1976, Sitton and Wallen 1976, Koford 1977, Russell 1978, Maser *et al.* 1981, Currier 1983, Williams 1986.

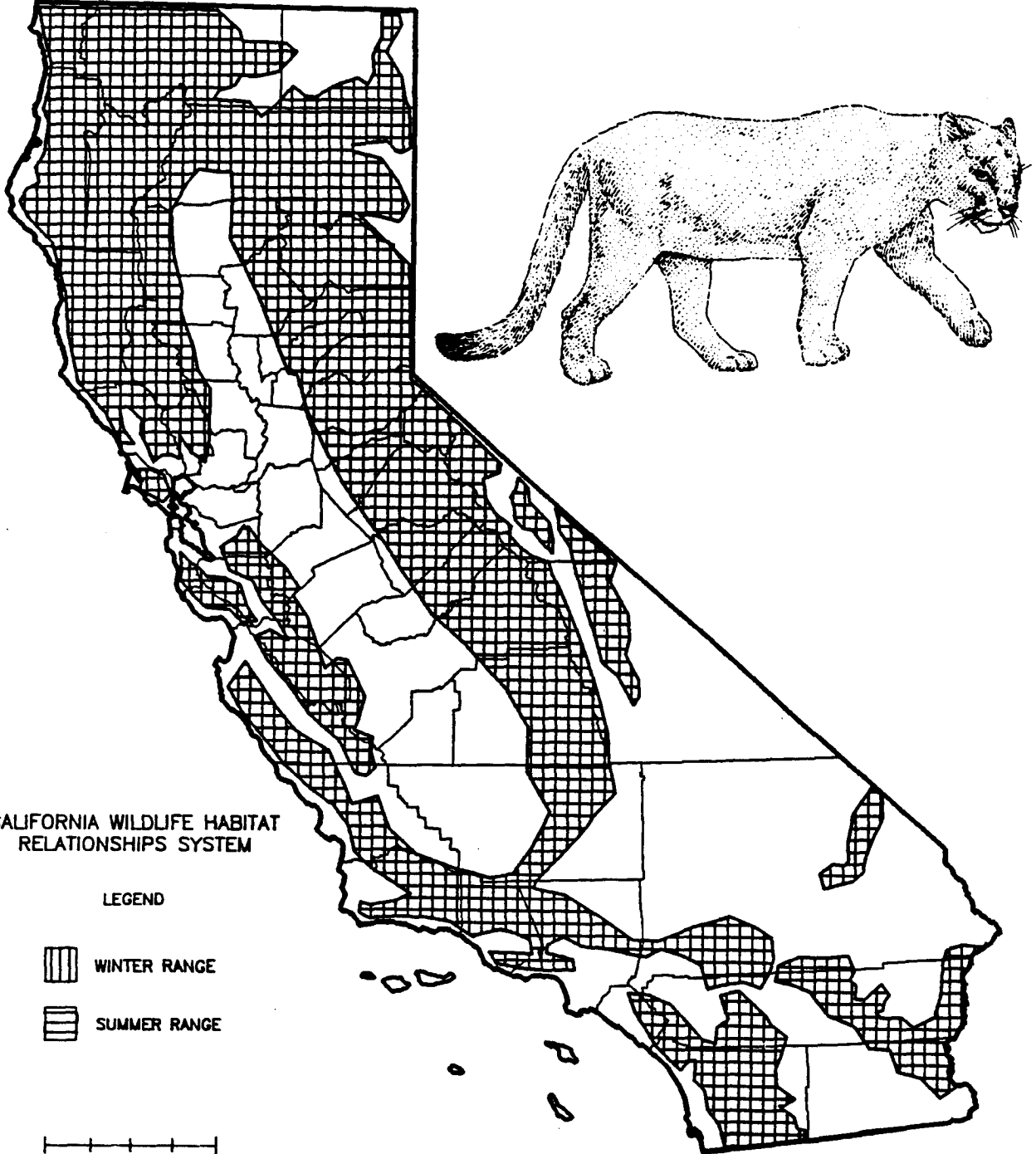
# MOUNTAIN LION

## AUTHORSHIP

Species Note Prepared By: G. Ahlborn

Species Note Edited By: G. Ahlborn, M. White

Species Note Reviewed By: M. White

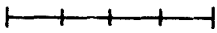


CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

 WINTER RANGE

 SUMMER RANGE

 100 miles

01/88

# M036 Spotted Bat *Euderma maculatum*

Family: Vespertilionidae Order: Chiroptera Class: Mammalia Date: November 16, 1984

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The spotted bat, considered to be one of North America's rarest mammals (IUCN 1972-78), has been found at a small number of localities, mostly in foothills and mountains and desert regions of southern California (Watkins 1977). Occasionally occurs outside this range. Little is known about the species in California. Habitats occupied range from arid deserts and grasslands through mixed conifer forests. The highest recorded elevation, 3230 m (10,600 ft), is in New Mexico (Reynolds 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Moths are the principal food. There is some evidence of beetle consumption. Feeds in flight, over water, and near the ground, using echolocation to find prey.

**Cover:** Apparently prefers to roost in rock crevices. Occasionally found in caves and buildings. Cliffs provide optimal roosting habitat.

**Reproduction:** Probably uses rock crevices.

**Water:** Drinks water, but has high ability to concentrate urine compared to bats of mesic habitats (Geluso 1978).

**Pattern:** Prefers sites with adequate roosting habitat, such as cliffs. Feeds over water and along washes. May move from forests to lowlands in autumn.

## SPECIES LIFE HISTORY

**Activity Patterns:** Nocturnal. This species is a late flyer; most captures are after midnight. Capable of torpor; hibernates in some areas.

**Seasonal Movements/Migration:** May make local movements in some areas, from high elevations in summer to lower elevations in autumn. Little is known about the California populations; may be yearlong residents, or migratory.

**Home Range:** No data found.

**Territory:** Apparently solitary. Four individuals were observed hibernating together.

**Reproduction:** Mates in autumn. Most births occur before mid-June. Lactating females reported from June to August. One young is produced per year.

**Niche:** May be found foraging with many other species. Appears to be a moth specialist. Rabies has been reported in California (Medeiros and Heckmann 1971).

**Comments:** Apparently rare in California. An increasing number of recent reports have occurred in British Columbia, Utah, and Texas. Solitary, crevice-roosting habits make this species difficult to find.

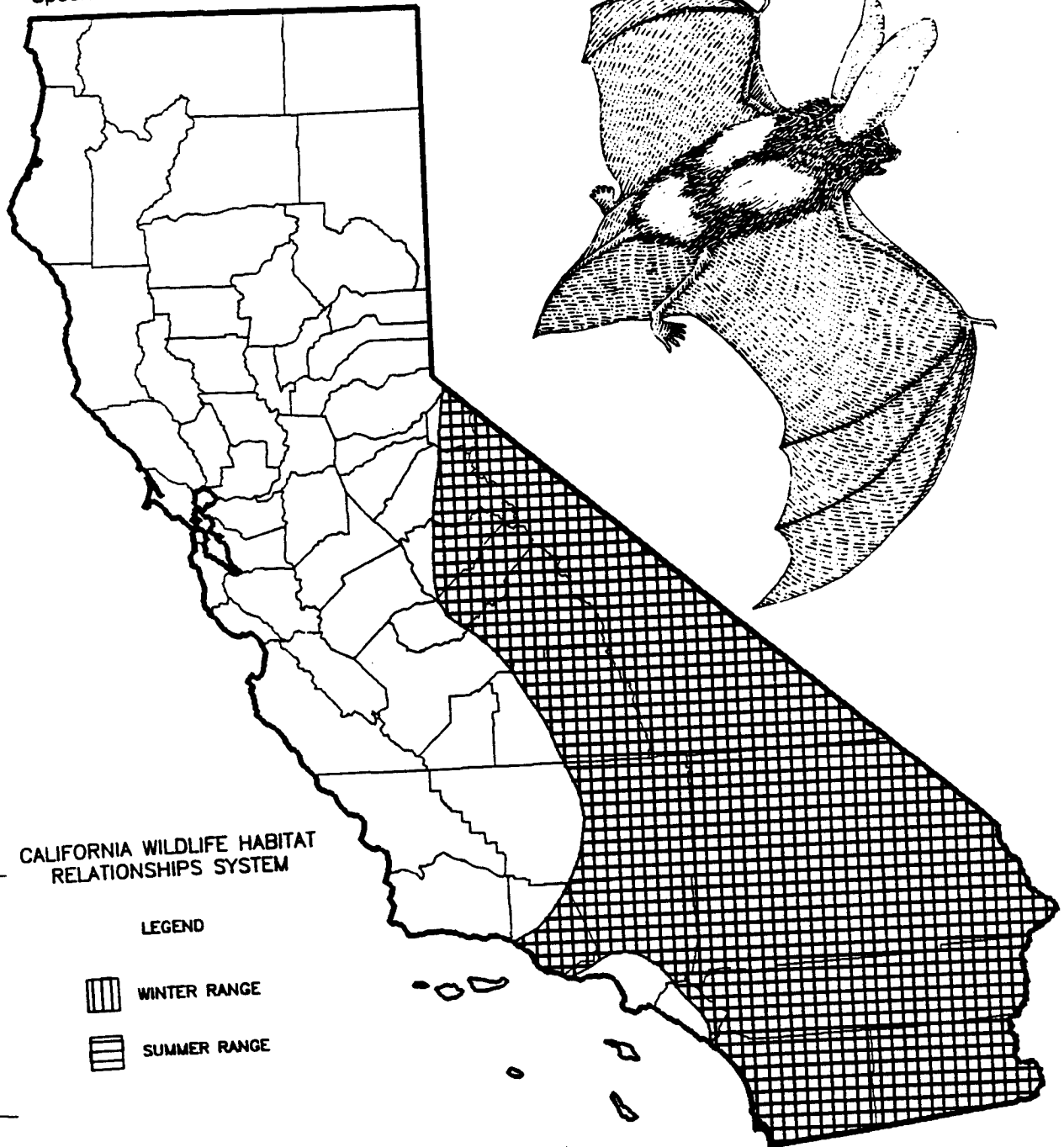
## REFERENCES

Stager 1957, Handley 1959, Constantine 1961, Easterla 1965, 1971, 1973, Ross 1961, Findley and Jones 1965, Medeiros and Heckmann 1971, Easterla and Whitaker 1972, IUCN 1972-78, Poche and Bailie 1974, Watkins 1977, Geluso 1978, Reynolds 1981.

# SPOTTED BAT


## AUTHORSHIP

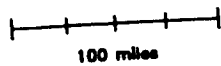
Species Note Prepared By: J. Harris  
Species Note Edited By: D. Alley, R. Duke  
Species Note Reviewed By: P. Brown



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE





# M166 Bobcat *Felis rufus*

Family: Felidae Order: Carnivora Class: Mammalia  
Management Status: Harvest Species Date: January 25, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Common to uncommon, permanent resident throughout most of California. Use nearly all habitats and successional stages. Optimal habitats are brushy stages of low and mid-elevation conifer, oak, riparian, and pinyon-juniper forests, and all stages of chaparral.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Bobcats largely are carnivorous. They eat various lagomorphs, rodents, a few deer (mostly young fawns), and some birds, reptiles, amphibians, and invertebrates. They also may consume substantial amounts of vegetation, mostly fruits and some grass (Provost *et al.* 1973, Fritts and Sealander 1978b). These cats stalk or ambush prey on the ground, from trees, or atop logs or rocks. Usually pursue prey for only a few leaps or bounds. May cache when prey abundant or too large to consume in 1 day.

**Cover:** Use cavities in rock areas, hollow logs, snags, stumps, and dense brush for cover.

**Reproduction:** Dens usually located in cavities in rock areas, in hollow logs, snags, stumps, or in dense brush.

**Water:** No information on water needs found. Probably need to drink water regularly.

**Pattern:** Suitable habitats for bobcats consist of large areas of broken, rough, rocky terrain supporting brushy deciduous and conifer forests or chaparral, adjacent to smaller areas of riparian habitat and stands of dense forest. Availability of water may limit bobcat distribution in xeric regions.

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong. Mostly nocturnal and crepuscular, some diurnal activity.

**Seasonal Movements/Migration:** Non-migratory. Distances travelled in 24 hr ranged from 2.6 km (1.6 mi) for an adult female, to 4.8 km (3 mi) for adult males.

**Home Range:** Female home ranges usually overlap very little; those of males may overlap those of other

males or females (Bailey 1974). In Riverside Co., Zezulak and Schwab (1980) reported that home ranges of 7 bobcats varied from 4.7-53.6 km<sup>2</sup> (1.8-20.7 mi<sup>2</sup>), with a mean of 26.3 km<sup>2</sup> (10.3 mi). In Idaho, home ranges of females averaged 19.3 km<sup>2</sup> (7.5 mi<sup>2</sup>), and varied from 9.1-45.3 km<sup>2</sup> (3.5-17.5 mi<sup>2</sup>). Those of males averaged 42.1 km<sup>2</sup> (16.3 mi<sup>2</sup>), and varied from 6.5-107.9 km<sup>2</sup> (2.5-41.7 mi<sup>2</sup>) (Bailey 1974).

**Territory:** Scent marking appears to reduce actual contact, and fighting is very unusual. In Idaho, territory and home range probably coincide (Bailey 1974, 1981). In northeastern California, Zezulak (1981) reported that home ranges overlapped up to 30% among females, but there was almost no overlap among males. In southern California, Lembeck (1978) noted almost no overlap of female home ranges, and up to 89% overlap among males. Zezulak and Schwab (1980) reported results intermediate to Zezulak (1981) and Lembeck (1978). Zezulak and Schwab (1980) speculated that bobcats may be territorial in some situations, but not all. This flexibility in behavior results in higher population levels where they are not territorial.

**Reproduction:** Bobcats usually breed in winter (Young 1958, Gashwiler *et al.* 1961). Gestation period 60-70 days; most young probably born in spring in California. Litter size averaged 3.5 in Wyoming, 2.8 in Utah, and 2.5 in Arkansas; range = 1-7. One litter/yr. Females polyestrous. Females breed in first yr; males in second yr. Lactation continues about 60 days. Individuals may live 10-14 yr.

**Niche:** Great horned owls may kill young bobcats (Jackson 1961), and adults occasionally are taken by mountain lions (Young 1958) and domestic dogs. Bobcats and coyotes may compete (Robinson 1961), and when coyote numbers are reduced by predator control, bobcat numbers may increase (Nunley 1978).

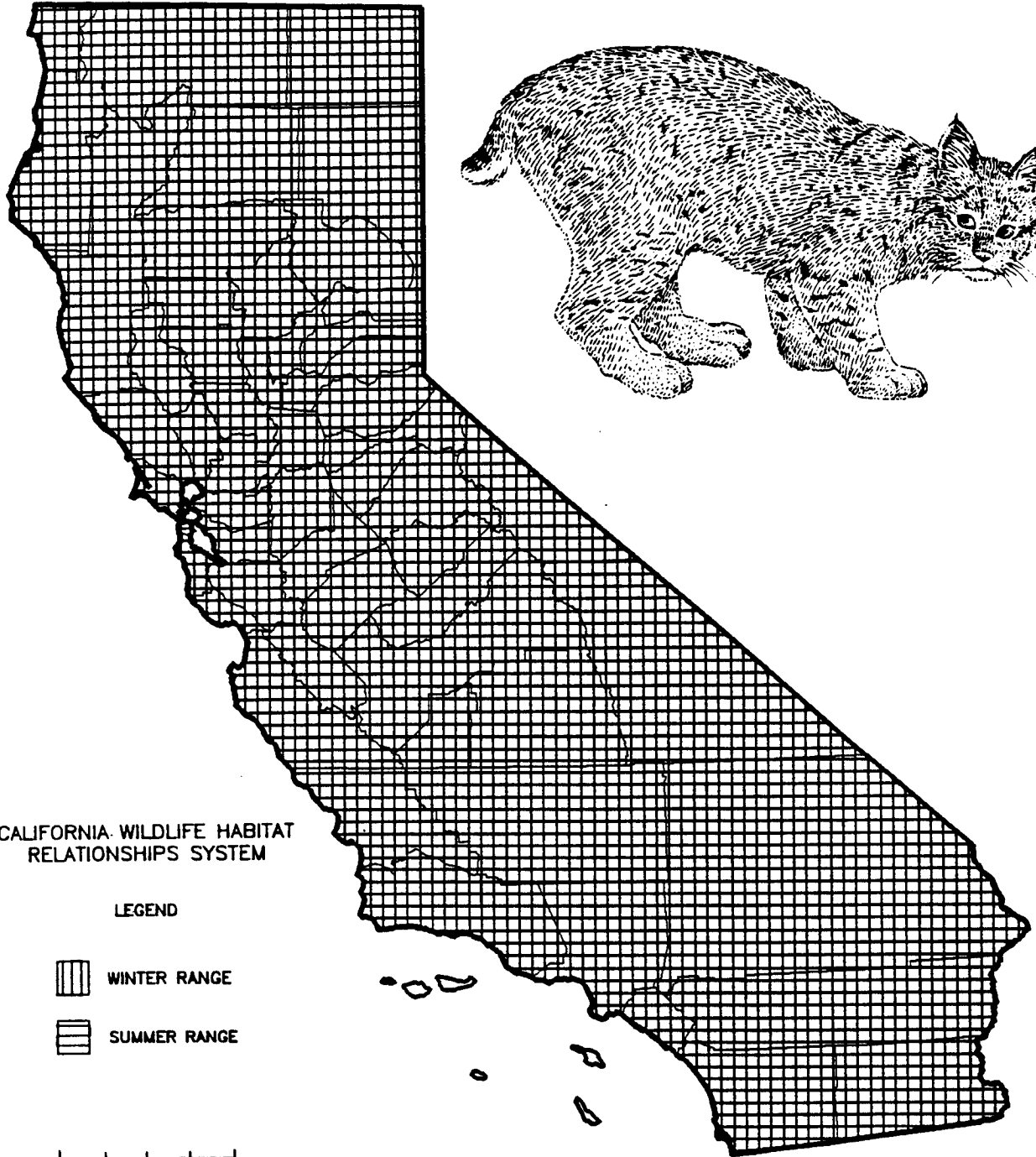
## REFERENCES

Young 1958, Gashwiler *et al.* 1961, Jackson 1961, Robinson 1961, Provost *et al.* 1973, Bailey 1974, 1981, Crowe 1975, Fritts and Sealander 1978a, 1978b, Lembeck 1978, Nunley 1978, Zezulak and Schwab 1980, Zezulak 1981.

# BOBCAT

## AUTHORSHIP

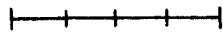
Species Note Prepared By: G. Ahlborn  
Species Note Edited By: M. White, G. Ahlborn  
Species Note Reviewed By: M. White



CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

  
100 miles

# M177 Elk *Cervus elaphus*

Family: Cervidae Order: Artiodactyla Class: Mammalia  
Management Status: Harvest Species Date: February 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon to common. Permanent resident with a scattered, reduced distribution now in California. Three subspecies occur in the state: Rocky Mountain elk (*C. e. nelsoni*, introduced); tule elk (*C. e. nannodes*, native); and Roosevelt elk (*C. e. roosevelti*, native). Rocky Mountain and Roosevelt elk breed in open, brushy stands of many deciduous and conifer habitats with abundant water. They feed in riparian areas, meadows, and herbaceous and brush stages of forest habitats. Several introductions, and reintroductions, of tule elk have been made by the California Department of Fish and Game in recent years. Tule elk introduced into the Owens Valley, Inyo Co., use brush, scrub, and herbaceous habitats throughout the year (McCullough 1969).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Herbivorous; they graze and browse. Diet varies greatly geographically. Eat grasses, forbs, tender twigs and leaves of shrubs and trees, fungi, some mast, and aquatic vegetation. In the Owens Valley, tule elk consumed substantial amounts of alfalfa in summer (McCullough 1969). At Prairie Creek, Humboldt Co., grasses made up 56-76%, and browse 21-34%, of the forage consumed (Harper *et al.* 1967). Forage on ground and into shrubs, and up to 1.8 m (6 ft) in trees.

**Cover:** Roosevelt and Rocky Mountain elk require mature stands of deciduous and conifer forest habitats. Dense brush understory is used for escape and thermal cover. These habitats are particularly important on south-facing slopes for cover in winter. In the Owens Valley, tule elk inhabit bottomlands with herbaceous vegetation, and low slopes and alluvial fans supporting predominately brushy habitats (McCullough 1969).

**Reproduction:** Calving occurs in areas with available water and brushy vegetation, that provide dense cover near openings, and seclusion from human impacts.

**Water:** The distance between open water sources should be no greater than 3.2 km (2 mi).

**Pattern:** Roosevelt and Rocky Mountain elk use uneven-aged forest stands that include old-growth, herbaceous openings, and water. These elk do not travel far from the cover of forest. Tule elk in the Owens Valley inhabit brush, scrub, and herbaceous habitats (McCullough 1969).

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong. Mostly crepuscular and nocturnal, some diurnal activity.

**Seasonal Movements/Migration:** Herds are sedentary within an annual home range, or migrate altitudinally. McCullough (1969) found the primary factor causing movement of tule elk herds in Owens Valley was availability of sufficient forage of high quality.

**Home Range:** Home ranges of cow-calf herds in Humboldt Co. averaged 2.9 km<sup>2</sup> (1.1 mi<sup>2</sup>) (Franklin *et al.* 1975). In Rocky Mountains, home ranges up to 50 km<sup>2</sup> (20 mi<sup>2</sup>) reported (Thomas and Toweill 1982). Elk herds may travel established routes in home ranges.

**Territory:** During the rut, bulls defend movable breeding territories consisting of cow harems. Territories of cow-calf herds in Humboldt Co. averaged 75 ha (185 ac) (Franklin *et al.* 1975).

**Reproduction:** Rut occurs from August into November. Gestation period about 255 days; most young in California born in May and June. Usually 1 calf born, occasionally 2, rarely 3. Young born in secluded areas with good cover. Cows sexually mature at 2 yr. In sedentary herds, female calves usually remain with mothers to form the cow-calf herds to which they belong throughout their lives. Adult males live separately in bull herds, and join cows only during rut.

**Niche:** Populations require seclusion from human interference, protection from poaching, and management to prevent local overpopulation. Proper management of forest and recreational activities can provide these requirements, and the mixture of habitats essential to health of the 3 subspecies. Humans, mountain lions, and coyotes are the major predators of elk, although a few, mostly young, probably are killed by black bears, bobcats, and feral dogs. Some competition for food and cover may occur between elk and domestic livestock, wild horses, and deer. Diseases and parasites in elk in California, include anthrax, bluetongue, paratuberculosis, necrobacillosis, and cyclophyllidean tapeworms (Davis and Anderson 1973, Davis *et al.* 1973). Also called wapiti.

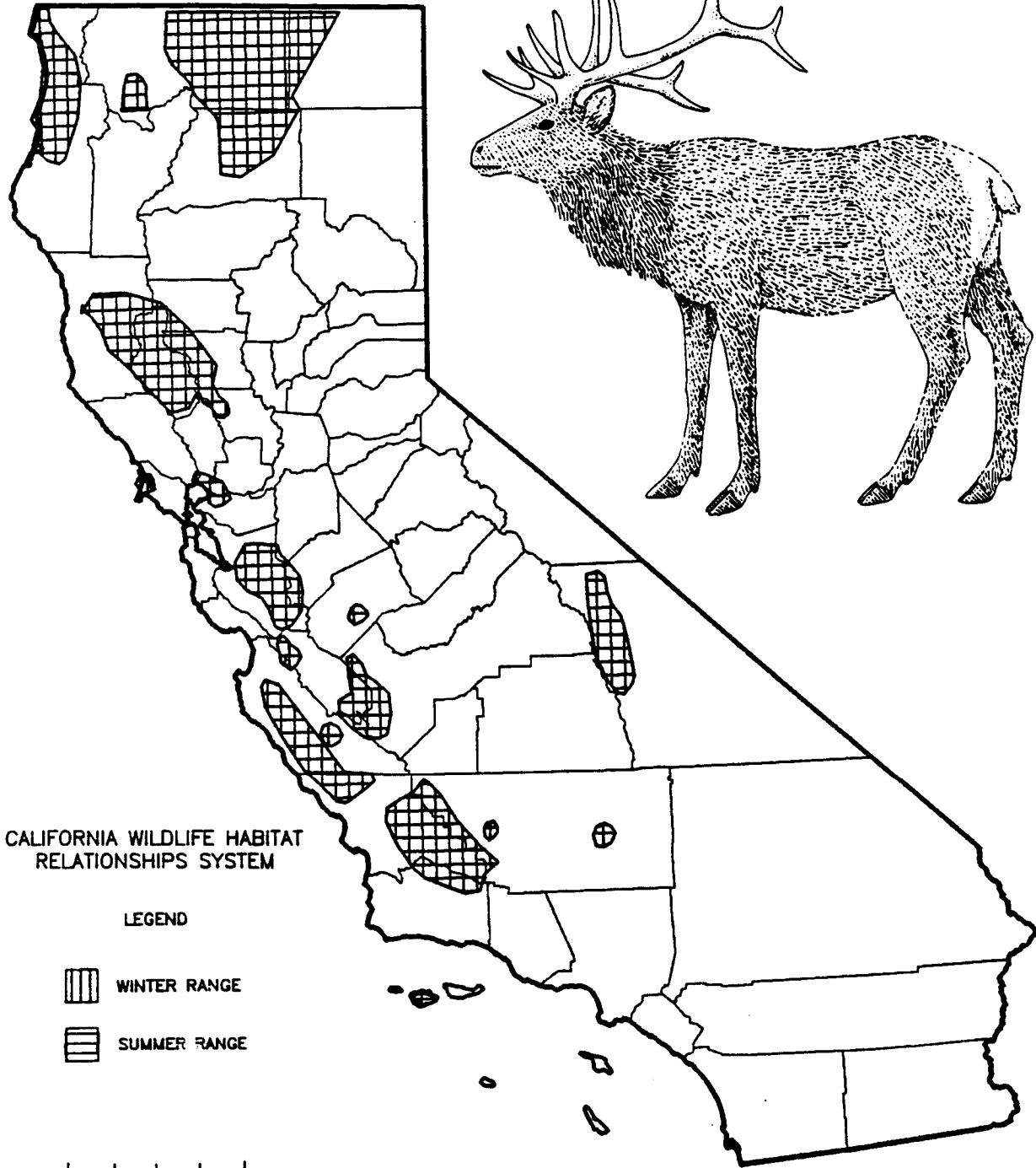
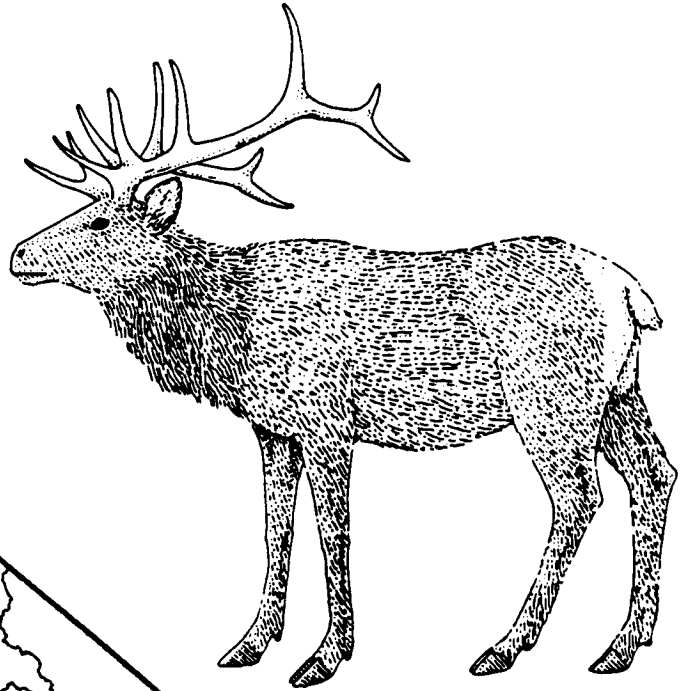
## REFERENCES

Murie 1951, Harper *et al.* 1967, McCullough 1969, Mackie 1970, Davis and Anderson 1973, Davis *et al.* 1973, Lieb 1973, Franklin *et al.* 1975, Peek and Hieb 1976, Boyce and Hayden-Wing 1979, Thomas and Toweill 1982.

# ELK

## AUTHORSHIP

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Species Note Edited By: M. White, G. Ahlborn  
Species Note Reviewed By: M. White



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

01/88

# M182 Pronghorn *Antilocapra americana*

Family: Antilocapridae Order: Artiodactyla Class: Mammalia  
Management Status: Harvest Species Date: April 23, 1984

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The pronghorn is a fairly common resident of northeastern California, and locally common in Mono Co. Since 1982, the California Department of Fish and Game has translocated pronghorns captured in northeastern California to Kern, San Luis Obispo, and San Benito cos., where small populations have become established. The pronghorn is found only in sagebrush, low sage, bitterbrush, grassland, pinyon-juniper, riparian, and alkali desert scrub habitats. Numbers in northeastern California have increased considerably in recent years; there were nearly 6000 in 1978 (Pyshora 1978, Salwasser and Shimamoto 1979).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Forbs are the most important forage during summer. Browse is an important forage in all seasons, and is critical in winter (Ferrel and Leach 1950, Pyshora 1977). Several species of sagebrush are the most important browse, followed by bitterbrush and other shrubs (Pyshora 1977). Grass is used to a lesser extent than forbs and browse, but may be important spring forage (O'Gara 1978, Kitchen and O'Gara 1982). Use of alfalfa and other cultivated plants in California has been low, but may be increasing (Salwasser and Shimamoto 1979).

**Cover:** Pronghorns rely on speed, and ability to detect moving predators at long distances, to escape in open habitats. Also use shrubs and rolling topography for cover.

**Reproduction:** Low rolling terrain and open vegetation used for reproduction.

**Water:** Free water apparently necessary. The amount of water consumed varies inversely with the quantity and succulence of green vegetation consumed. Autenrieth (1978) reported daily consumption rates of 0.34 l (0.36 qt)/day in May, and 4.5 l (4.8 qt)/day in August.

**Pattern:** Pronghorns prefer low, rolling topography in open grassland and sagebrush communities. Optimal habitat is roughly 40-60% grass, 10-30% forbs, and 5-20% shrub cover (Sundstrom *et al.* 1973, Autenrieth 1978, Yoakum 1978). Low vegetation of up to 38 cm (15 in) is preferred.

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong. Mostly crepuscular, but may be active day or night. Peak feeding time is shortly after sunrise and shortly before sunset (Kitchen 1974, Kitchen and O'Gara 1982).

**Seasonal Movements/Migration:** Pronghorns may migrate between summer and winter ranges. May move up to 150 km (93 mi) between ranges in California.

**Home Range:** Winter herds contain all ages and sexes, and may number 2000. Groups of 600 have been sighted in California (Pyshora 1977). In spring, winter herds break up into smaller groups. Young males form bachelor herds of 2-40, and females may be found in groups of 5-20. Home ranges are extremely variable, depending on habitat, year, and location. Yoakum (1978) reported daily movements of 0.1-0.8 km (0.06-0.5 mi) in spring and summer, and 3.2-9.7 km (1.9-5.8 mi) in fall and winter. During periods of extreme winter weather, may restrict activity to very small areas.

**Territory:** On the summer range, dominant males hold widely spaced territories of about 0.2-5.2 km<sup>2</sup> (0.06-2.0 mi<sup>2</sup>) (Kitchen 1974, O'Gara 1978). Territories usually contain some water. Females are attracted to territories for mating.

**Reproduction:** Polygynous, mating from mid-September to early October. Bucks maintain harems of up to 15 does (Yoakum 1978). Gestation about 252 days. Twins generally born in spring, single births are less common. Young precocial, and weaned during rut. At this time, small herds of fawns may be observed. Females generally mate first time as yearlings. Males, though sexually mature, usually do not mate as yearlings because of inability to hold a territory.

**Niche:** Compete with domestic sheep, feral burros, and wild horses. Excessive use by these species will reduce carrying capacity of range for pronghorns. Potential predators include bobcats and coyotes. Fences, and other barriers associated with human activities, not designed to allow them to pass, are detrimental to pronghorns.

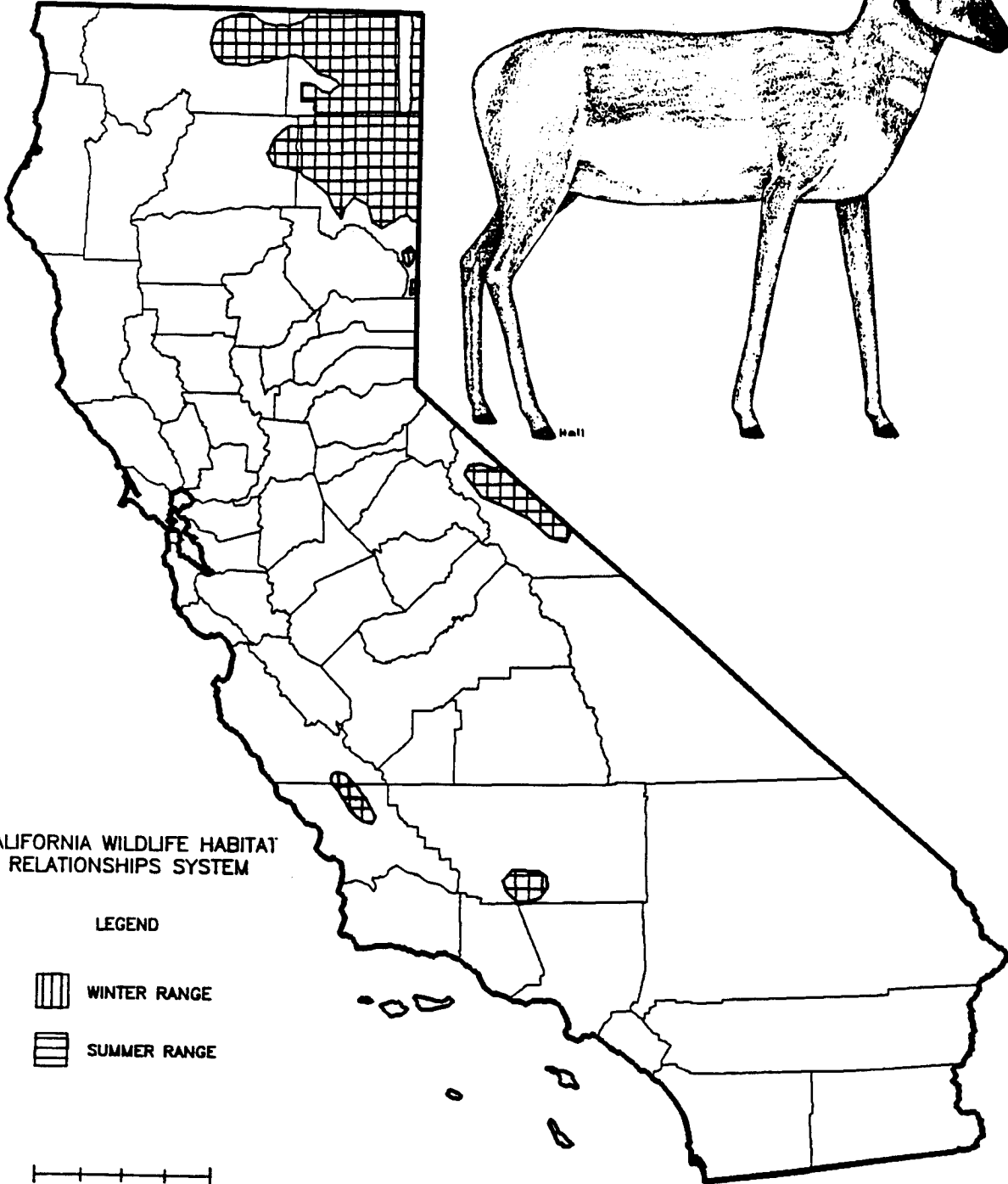
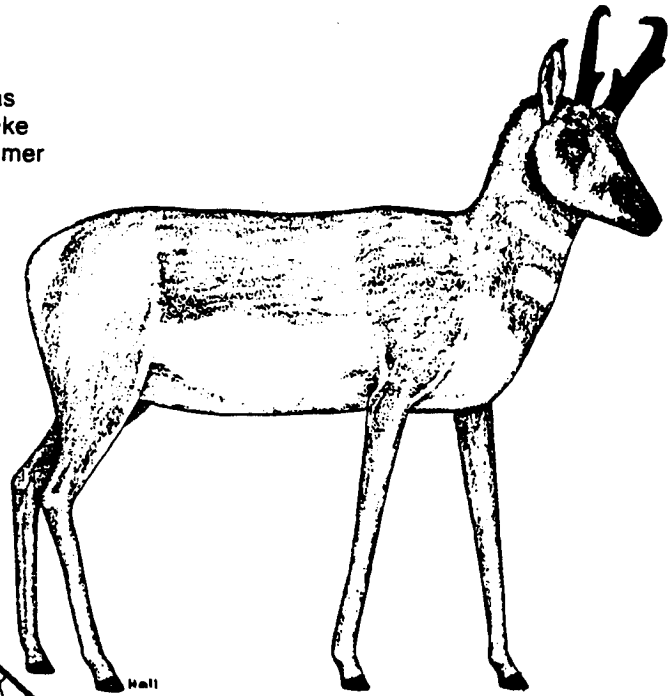
## REFERENCES

Ferrel and Leach 1950, Sundstrom *et al.* 1973, Kitchen 1974, Pyshora 1977, 1978, Autenrieth 1978, O'Gara 1978, Yoakum 1978, Salwasser and Shimamoto 1979, Kitchen and O'Gara 1982.

# PRONGHORN

## AUTHORSHIP

Species Note Prepared By: R. A. Hopkins  
Species Note Edited By: J. Harris, R. Duke  
Species Note Reviewed By: H. Shellhammer



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

# M038 Pallid Bat *Antrozous pallidus*

Family: Vespertilionidae Order: Chiroptera Class: Mammalia Date: November 16, 1984

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The pallid bat is a locally common species of low elevations in California. It occurs throughout California except for the high Sierra Nevada from Shasta to Kern cos., and the northwestern corner of the state from Del Norte and western Siskiyou cos. to northern Mendocino Co. A wide variety of habitats is occupied, including grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. The species is most common in open, dry habitats with rocky areas for roosting. A yearlong resident in most of the range.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Takes a wide variety of insects and arachnids, including beetles, orthopterans, homopterans, moths, spiders, scorpions, solpugids, and Jerusalem crickets. The stout skull and dentition of this species allows it to take large, hard-shelled prey. Forages over open ground, usually 0.5–2.5 m (1.6–8 ft) above ground level. Foraging flight is slow and maneuverable with frequent dips, swoops, and short glides. Many prey are taken on the ground. Gleaning is frequently used, and a few prey are taken aerially. Can maneuver well on the ground. May carry large prey to a perch or night roost for consumption. Ingestion of fruit in one study (Howell 1980) was a result of feeding on frugivorous moths. Uses echolocation for obstacle avoidance; possibly utilizes prey-produced sounds while foraging.

**Cover:** Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings. Roost must protect bats from high temperatures. Bats move deeper into cover if temperatures rise. Night roosts may be in more open sites, such as porches and open buildings. Few hibernation sites are known, but probably uses rock crevices.

**Reproduction:** Maternity colonies form in early April, and may have a dozen to 100 individuals. Males may roost separately or in the nursery colony.

**Water:** Needs water, but has a good urine-concentrating ability (Geluso 1978).

**Pattern:** Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging.

## SPECIES LIFE HISTORY

**Activity Patterns:** Nocturnal. Hibernates. Emerges late (30–60 min after sunset), with a major activity peak 90–190 min after sunset, and a second peak shortly before

dawn. Briefer foraging periods occur in autumn, and activity is infrequent below 2°C (35°F). Undergoes shallow torpor daily. Hibernates in winter near the summer day roost (Hermanson and O'Shea 1983).

**Seasonal Movements/Migration:** Makes local movements to hibernation sites. There is a post-breeding season dispersal.

**Home Range:** Forages 0.5–2.5 km (1–3 mi) from day roost. Capable of homing from distances of a few miles, but not further.

**Territory:** Social. Most pallid bats (95%) roost in groups of 20, or more, ranging to 162. Group size is important for metabolic economy and growth of young. Young animals occupy the center of clusters. Individuals out of clusters experience higher rates of weight loss (Trune and Slobodchikoff 1976, 1978).

**Reproduction:** Mates from late October–February. Fertilization is delayed, gestation is 53–71 days. Young are born from April–July, mostly from May–June. The average litter is 2, but females reproducing for the first time usually have 1 young. Litter size is 1–3. The altricial young are weaned in 7 wk, and are observed flying in July and August. Females nurse only their own young. Females and juveniles forage together after weaning. Females mate in first autumn, males in second. Maximum recorded longevity is 9 yr, 1 mo (Cockrum 1973).

**Niche:** This slow-flying, maneuverable species is adapted to feed on large, hard-shelled prey on the ground or in foliage. It is known to roost with a number of other bats, principally *Myotis spp.* and *Tadarida brasiliensis*. Owls and snakes are known predators.

**Comments:** Very sensitive to disturbance of roosting sites. Such sites are essential for metabolic economy, juvenile growth and as night roosts to consume prey.

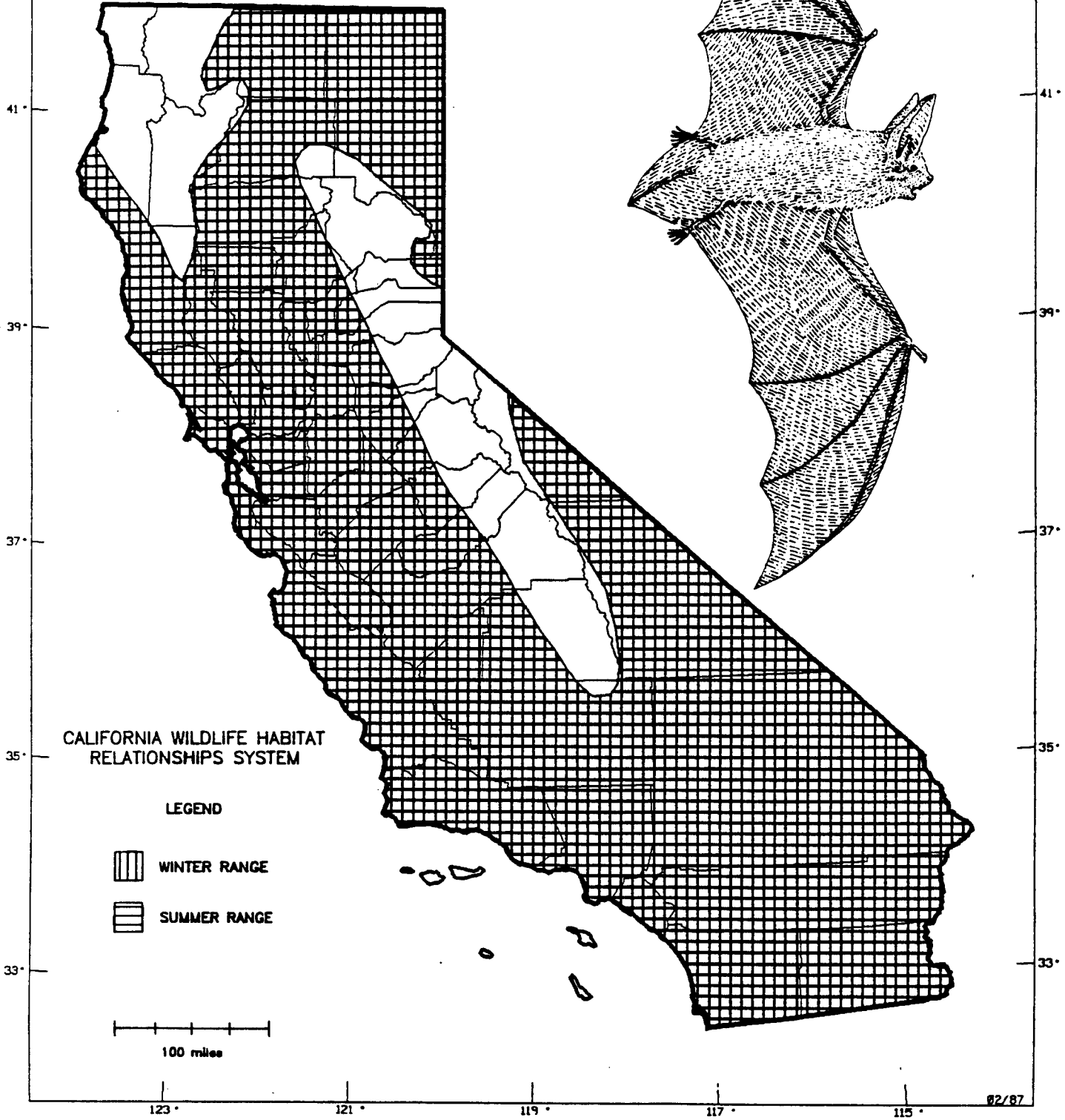
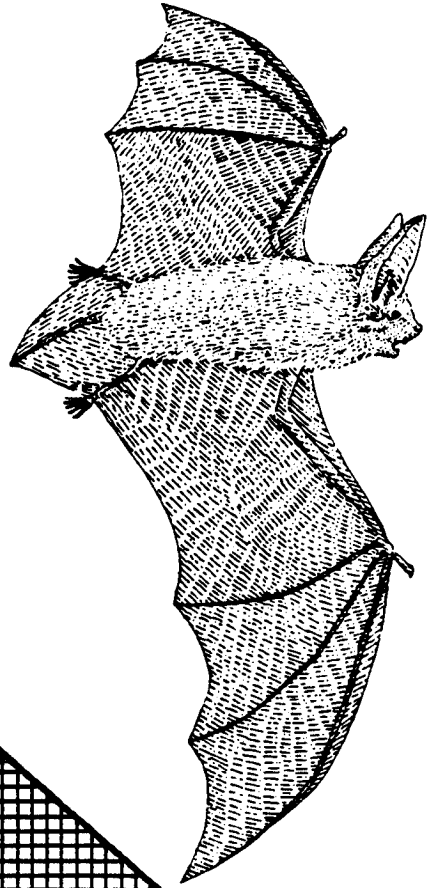
## REFERENCES

Hatt 1923, Huey 1936, Engler 1943, Orr 1954, Beck and Rudd 1960, Ross 1961, 1967, Cockrum and Cross 1964, Davis 1966, 1969a, 1969b, Licht and Leitner 1967, O'Farrell *et al.* 1967, Barbour and Davis 1969, O'Farrell and Bradley 1970, Easterla and Whitaker 1972, Cockrum 1973, Dietz 1973, Black 1974, Findley *et al.* 1975, Brown 1976, Trune and Slobodchikoff 1976, 1978, Vaughan and O'Shea 1976, O'Shea and Vaughan 1977, Whitaker *et al.* 1977, Geluso 1978, Howell 1980, Freeman 1981, Hermanson and O'Shea 1983.

# PALLID BAT

## AUTHORSHIP

Species Note Prepared By: J. Harris  
Species Note Edited By: D. Alley, R. Duke  
Species Note Reviewed By: P. Brown



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

02/87



# M087 San Joaquin Pocket Mouse *Perognathus inornatus*

Family: Heteromyidae Order: Rodentia Class: Mammalia

Management Status: *P. i. psammophilus*, California Species of Special Concern

Date: March 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Occurs in dry, open grasslands or scrub areas on fine-textured soils between 350 and 600 m (1100 and 2000 ft) in the Central and Salinas valleys.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Seeds probably constitute the majority of the diet; also eats green vegetation and insects. Seeds are gathered, carried in cheek pouches, and stored in the burrows.

**Cover:** Hawbecker (1951) found that the San Joaquin pocket mouse occurred on shrubby ridge tops and hillsides. Grinnell (1933) characterized the habitat as being open, sandy areas with grasses and forbs. Digs burrows for cover.

**Reproduction:** Young apparently born and raised in a nest built in the burrow.

**Water:** No data found.

**Pattern:** No additional data found.

## SPECIES LIFE HISTORY

**Activity Patterns:** Nocturnal. May become torpid during extreme heat or cold.

**Seasonal Movements/Migration:** Non-migratory.

**Home Range:** No data found.

**Territory:** No data found.

**Reproduction:** Reproduction probably occurs during spring and early summer.

**Niche:** *P. inornatus* is similar in appearance, and probably in habits, to *P. longimembris*. Sympatric in a portion of its range with at least 7 other seed-eating heteromyid rodents: *Dipodomys nitratoideus*, *D. heermanni*, *D. ingens*, *D. microps*, *D. panamintinus*, *P. alticola*, and *P. longimembris*. Badgers, owls, weasels, skunks, kit foxes, and domestic cats probably prey on San Joaquin pocket mice.

**Comments:** *P. i. psammophilus* is a California Species of Special Concern (Williams 1986).

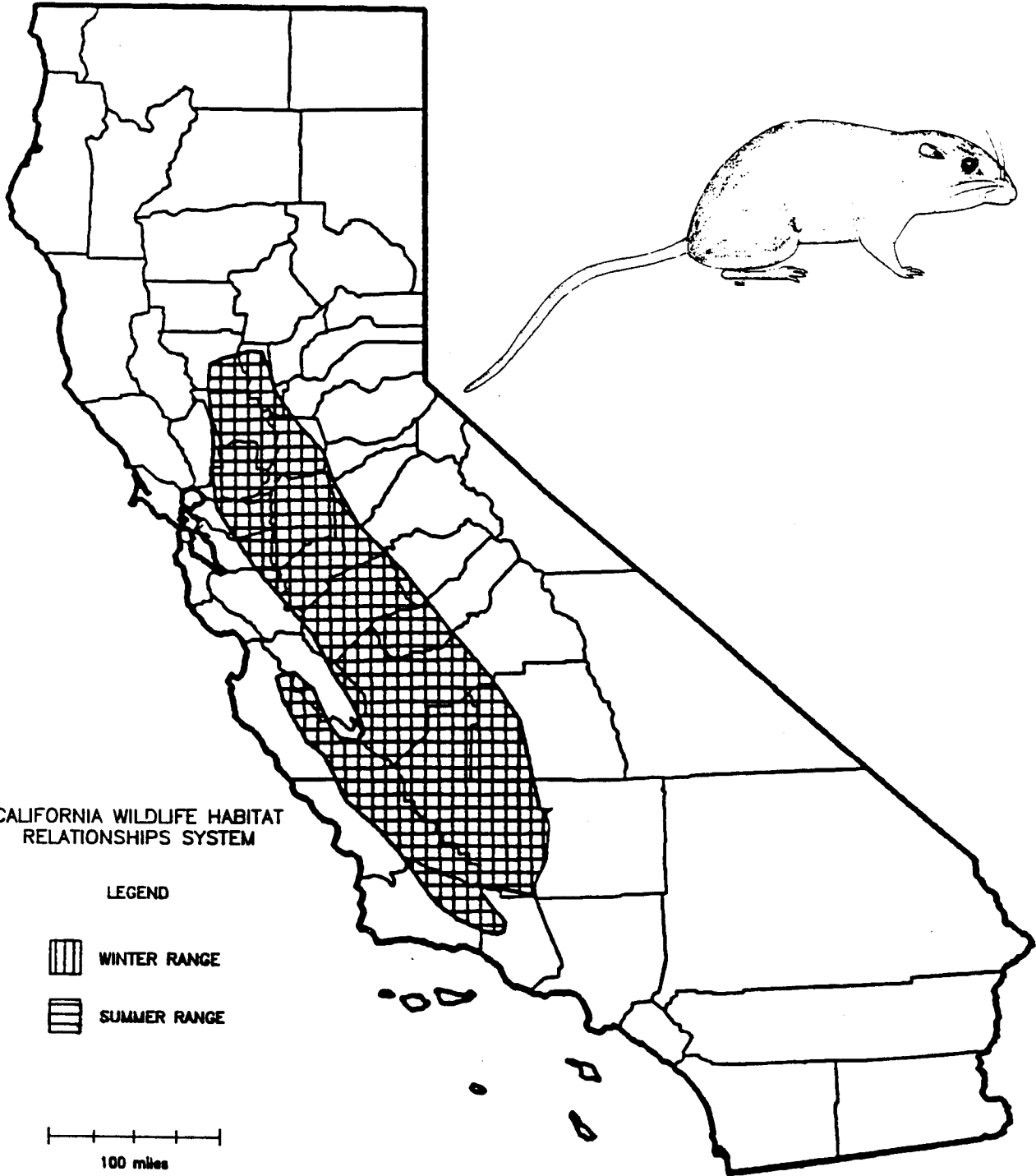
## REFERENCES

Grinnell 1933, Hawbecker 1951, Ingles 1965, Williams 1986.

# SAN JOAQUIN POCKET MOUSE

## AUTHORSHIP

Species Note Prepared By: T. E. Harvey, G. Ahlborn  
Species Note Edited By: G. Ahlborn  
Species Note Reviewed By: M. White

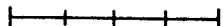


CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

 WINTER RANGE

 SUMMER RANGE

  
100 miles

02/87

# B109 California Condor *Gymnogyps californianus*

Family: Cathartidae Order: Falconiformes Class: Aves

Management Status: Federal Endangered, California Endangered, California Fully Protected Date: March 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Endangered, permanent resident of the semi-arid, rugged mountain ranges surrounding the southern San Joaquin Valley, including the Coast Ranges from Santa Clara Co. south to Los Angeles Co., the Transverse Ranges, Tehachapi Mts., and southern Sierra Nevada. Forages over wide areas of open rangelands, roosts on cliffs and in large trees and snags. Occurs mostly between sea-level and 2700 m (0-9000 ft), and nests from 610-1372 m (2000-6500 ft). Nonbreeding individuals move north to Kern and Tulare cos. in April, often returning south in September to winter in Tehachapi Mts., Mt. Pinos, and Ventura and Santa Barbara cos. Total population in early 1980s estimated to be fewer than 20, and declining (Ogden 1982). Occurrence in the wild now in question. Two U.S. Forest Service sanctuaries set aside within the Los Padres National Forest, primarily for nesting and roosting protection.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Strictly a scavenger, eating carrion such as cattle, sheep, deer, and ground squirrel carcasses. Dead cattle have provided the most important food source in recent decades. Requires about 1 kg (2.2 lb) of food/day. Can convert food to fat rapidly after gorging; thus, can remain for several days without feeding (Wilbur 1978). Searches for food while soaring and gliding. Food must be in open areas to enable landing and take-off (Koford 1953). Often forages over areas 7.3 to 30 km<sup>2</sup> (2.8 to 11.6 mi<sup>2</sup>), or larger. May fly 56 km (35 mi), or more, from roost to feeding sites (Koford 1953).

**Cover:** Traditional roosting sites are ledges or cavities on cliffs. Also uses old-growth Douglas-fir, ponderosa pine, and snags, in undisturbed areas.

**Reproduction:** Nests in caves, crevices, behind rock slabs, or on large ledges on high sandstone cliffs. Nest often surrounded by dense brush. A nest is not constructed; egg laid on bare surface. Nesting occurs within the Coast and Transverse Ranges of Ventura and Santa Barbara cos.

**Water:** Uses water for drinking and bathing.

**Pattern:** Requires vast expanses of open savannah, grasslands, and foothill chaparral, with cliffs, large trees, and snags for roosting and nesting.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Subadults and nonbreeders often move north March to May to traditional roosts and foraging areas in the southwestern Sierra Nevada, returning south again at the end of summer. Breeding pair remains near nesting area yearlong.

**Home Range:** No additional data found.

**Territory:** Territoriality not confirmed at any season. Simultaneous use of nest sites has occurred as close as 0.8 km (0.5 mi) apart; nest defense between adults was not observed (Koford 1953).

**Reproduction:** Breeds annually, or less often. Courtship observed as early as October. One egg laid February to May. Incubation approximately 59 days, after which young remains in nest for about 5 mo. Young remains dependent on parents for food for several months after begins flying.

**Niche:** Reduced nesting success in recent decades associated with eggshell thinning, probably caused by presence of DDE in eggshell (Kiff *et al.* 1979). Golden eagles have been observed attempting to prey on condor chicks (Ogden 1981). Turkey vulture competes with condor for food. Numbers of cattle and other livestock carcasses reduced in recent years because of changes in husbandry practices, including increased salvaging of carcasses.

**Comments:** Apparently extinct in the wild after 1987. Captive breeding program underway, with plans to reintroduce into the wild in the early 1990s.

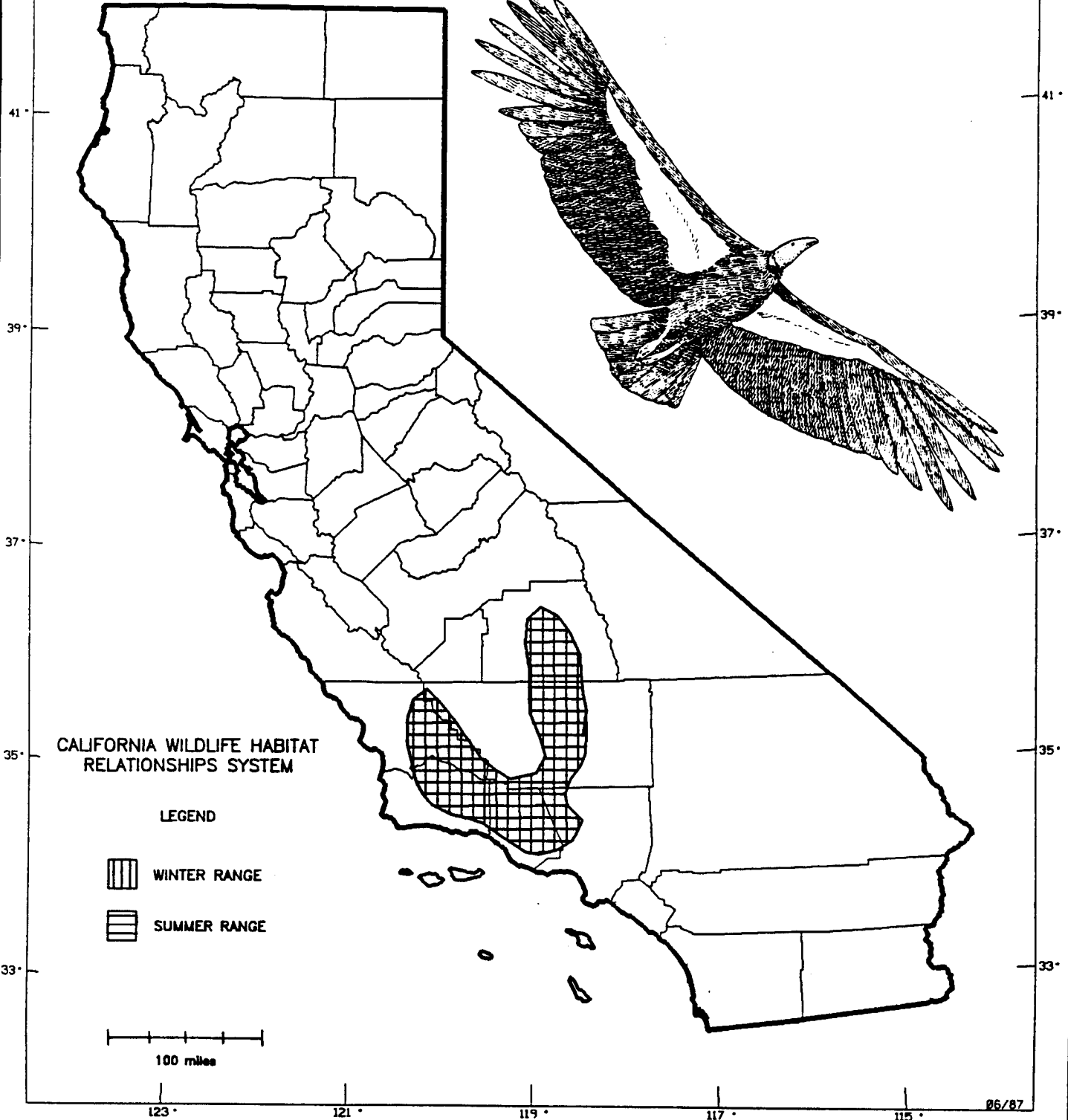
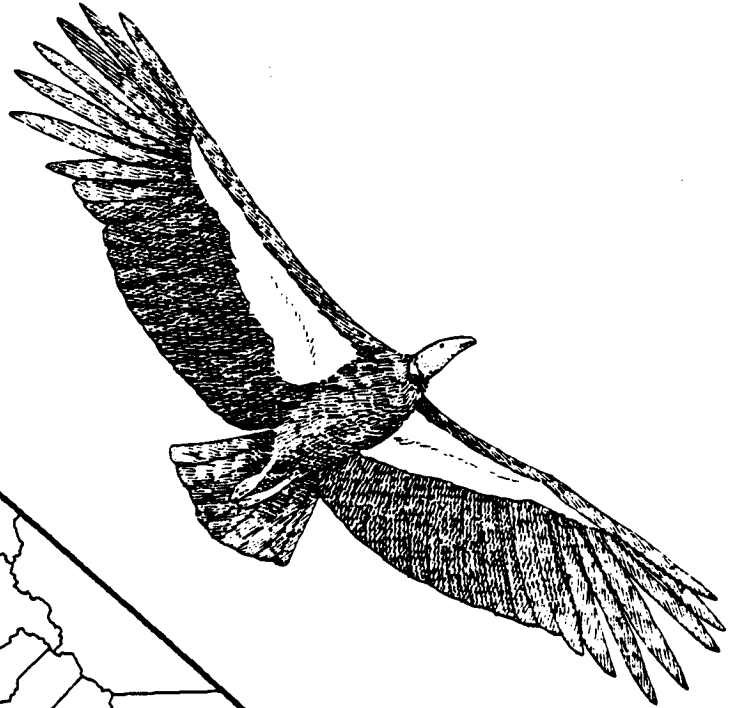
## REFERENCES

Koford 1953, Miller *et al.* 1965, Brown and Amadon 1968, Wilbur 1976, 1978, 1980, Verner 1978, Kiff *et al.* 1979, Ogden 1981, 1982.

# CALIFORNIA CONDOR

## AUTHORSHIP

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



# B113 Bald Eagle *Haliaeetus leucocephalus*

**Family:** Accipitridae **Order:** Falconiformes **Class:** Aves

**Management Status:** Federal Endangered, California Endangered, California Fully

**Protected Date:** March 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity cos. About half of the wintering population is in the Klamath Basin. More common at lower elevations; not found in the high Sierra Nevada. Fairly common as a local winter migrant at a few favored inland waters in southern California. Largest numbers occur at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Requires large bodies of water, or free-flowing rivers with abundant fish, and adjacent snags or other perches. Swoops from hunting perches, or soaring flight, to pluck fish from water. Will wade into shallow water to pursue fish. Pounces on, or chases, injured or ice-bound water birds. In flooded fields, occasionally pounces on displaced voles, or other small mammals. Groups may feed gregariously, especially on jawing fish. Scavenges dead fish, water birds, and mammals. Open, easily approached hunting perches and feeding areas used most frequently.

**Cover:** Perches high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water. Roosts communally in winter in dense, sheltered, remote conifer stands. In Klamath National Forest, winter roosts were 16-19 km (10-12 mi) from feeding areas (Spencer 1976b).

**Reproduction:** Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Nests most frequently in stands with less than 40% canopy, but usually some foliage shading the nest (Call 1978). Often chooses largest tree in a stand on which to build stick platform nest. Nest located 16-61 m (50-200 ft) above ground, usually below tree crown. Species of tree apparently not so important as height and size. Nest usually located near a permanent water source.

**Water:** In California, 87% of nest sites were within 1.6 km (1 mi) of water.

**Pattern:** Requires large, old-growth trees or snags in remote, mixed stands near water.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity. Winter feeding usually occurs immediately after dawn and in late afternoon.

**Seasonal Movements/Migration:** Individuals that breed in California may make only local winter movements in search of food. Winter migrants move from north to south.

**Home Range:** No data found.

**Territory:** Breeding territory in Alaska (n = 14), varied from 11-45 ha (28-112 ac), and averaged 23 ha (57 ac) (Hensel and Troyer 1964). Breeding territory defended from mating through fledging. Minimum distances between nests were 1 km (0.6 mi) in Alaska, and 17 km (10 mi) in Washington.

**Reproduction:** Breeds February through July; peak activity March to June. Clutch size usually 2; range 1-3. Incubation usually 34-36 days. Semialtricial young hatch asynchronously (Ehrlich *et al.* 1988). Monogamous, and breeds first at 4-5 yr.

**Niche:** Highly vulnerable to DDE-induced eggshell thinning. Competes with, and steals prey from osprey. Territories have been abandoned after disturbance from logging, recreational development, and other human activities near nests (Thelander 1973). Usually does not begin nesting if human disturbance is evident.

## REFERENCES

Hensel and Troyer 1964, Brown and Amadon 1968, Snow 1973, Thelander 1973, Spencer 1976b, Call 1978, Steenhof 1978, Detrich 1979, Lehman 1979, Ehrlich *et al.* 1988.

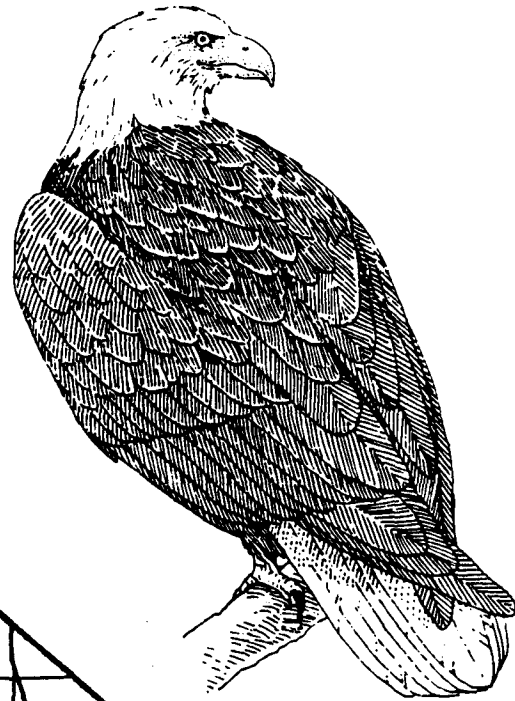
# BALD EAGLE

## AUTHORSHIP

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

Species Note Edited By: L. Kiff

Species Note Reviewed By: L. Kiff

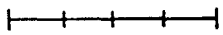


CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

 WINTER RANGE

 SUMMER RANGE

 100 miles

96/87

# B126 Golden Eagle *Aquila chrysaetos*

Family: Accipitridae Order: Falconiformes Class: Aves

Management Status: California Fully Protected, California Species of Special Concern

Date: March 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon permanent resident and migrant throughout California, except center of Central Valley. Perhaps more common in southern California than in north. Ranges from sea level up to 3833 m (0-11,500 ft) (Grinnell and Miller 1944). Habitat typically rolling foothills, mountain areas, sage-juniper flats, desert.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Eats mostly lagomorphs and rodents; also takes other mammals, birds, reptiles, and some carrion. Diet most varied in nonbreeding season. Needs open terrain for hunting; grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats. Soars 30-90 m (98-297 ft) above ground in search of prey, or makes low, quartering flights, often 7-8 m (23-26 ft) above ground. Occasionally searches from a perch and flies directly to prey (Carnie 1954). Sometimes pirates food from other predators. Hunting in pairs apparently common.

**Cover:** Secluded cliffs with overhanging ledges and large trees used for cover.

**Reproduction:** Nests on cliffs of all heights and in large trees in open areas. Alternative nest sites are maintained, and old nests are reused. Builds large platform nest, often 3 m (10 ft) across and 1 m (3 ft) high, of sticks, twigs, and greenery. Rugged, open habitats with canyons and escarpments used most frequently for nesting.

**Water:** No data found. Water needs probably met from prey.

**Pattern:** Uses rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Mostly resident, but may move downslope for winter, or upslope after breeding season. Some migrate into California for winter.

**Home Range:** Home range probably same as territory. Size of home range related to prey density and availability, and openness of terrain.

**Territory:** Territory estimated to average 57 km<sup>2</sup> (22 mi<sup>2</sup>) in Idaho (Beecham and Kocher 1975), 171-192 km<sup>2</sup> (66-74 mi<sup>2</sup>) in Montana (McGahan 1968), 23 km<sup>2</sup> (9 mi<sup>2</sup>) in Utah (Smith and Murphy 1973), 93 km<sup>2</sup> (36 mi<sup>2</sup>) in southern California (Dixon 1937), and 124 km<sup>2</sup> (48 mi<sup>2</sup>) in northern California (Smith and Murphy 1973).

**Reproduction:** Breeds from late January through August; peak in March through July. Clutch size 1-3, usually 2. Eggs laid early February to mid-May. Incubation 43-45 days (Beebe 1974), and nestling period usually 65-70 days.

**Niche:** Occasionally preys on domestic calves and lambs. May compete with ferruginous hawks for small mammals, and with California condors for carrion. May desert nest in early incubation if disturbed by humans (Thelander 1974).

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

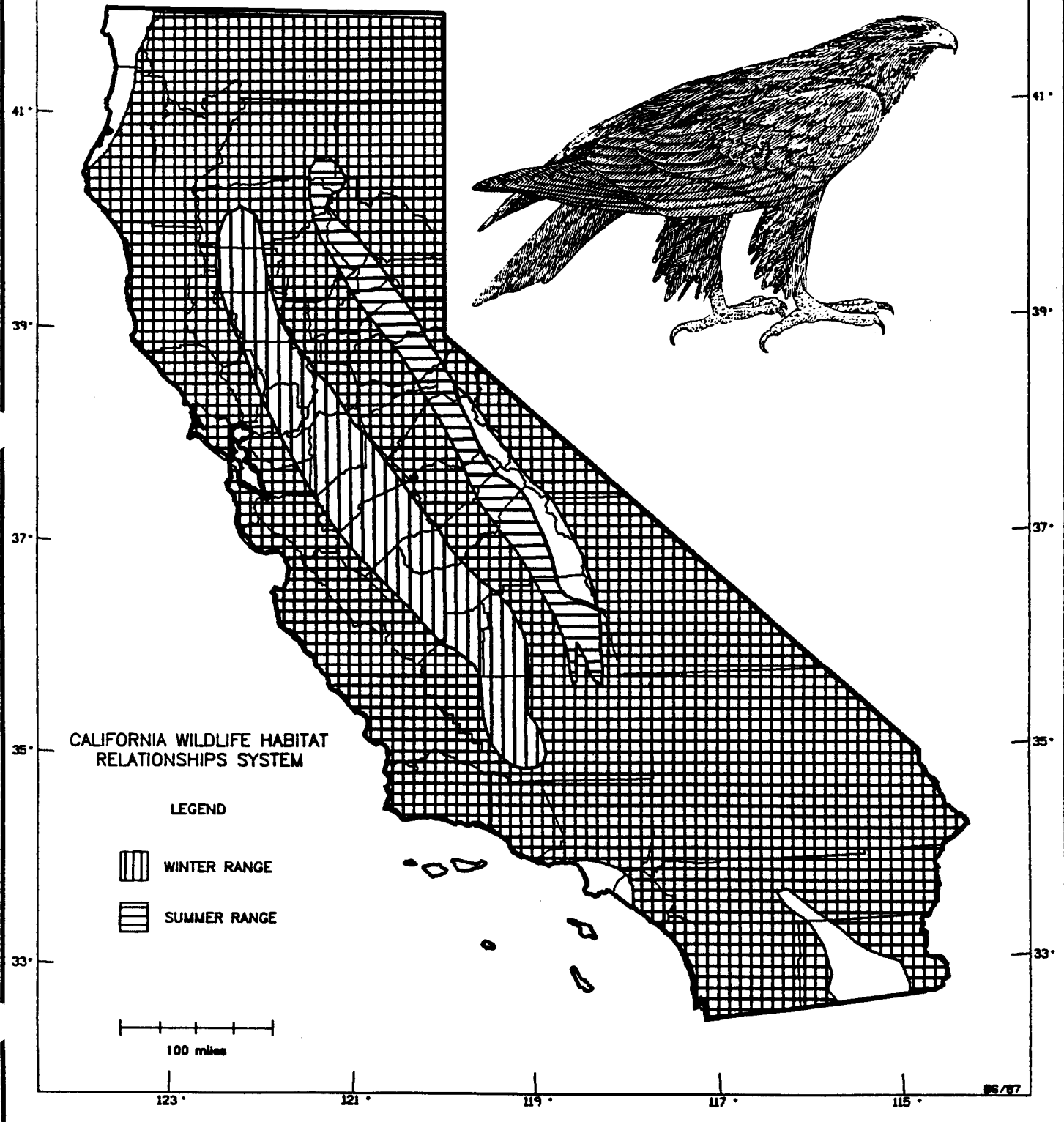
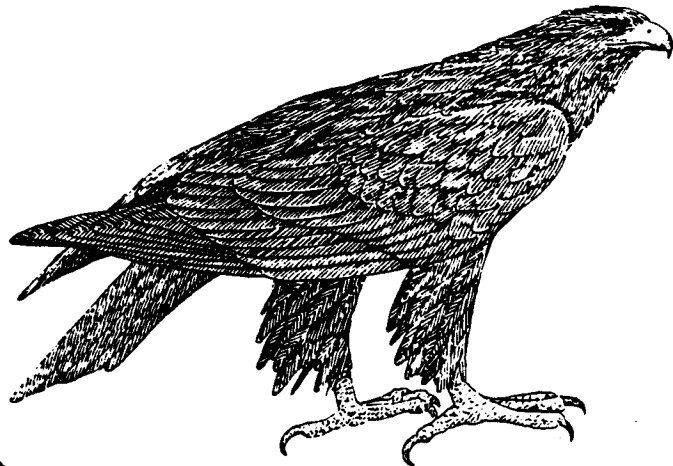
## REFERENCES

Dixon 1937, Grinnell and Miller 1944, Carnie 1954, McGahan 1968, Smith and Murphy 1973, Beebe 1974, Thelander 1974, Beecham and Kochert 1975, Olendorff 1976, Remsen 1978.

# GOLDEN EAGLE

## 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



# B117 Northern Goshawk *Accipiter gentilis*

Family: Accipitridae Order: Falconiformes Class: Aves

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

Date: February 1, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

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

## SPECIFIC HABITAT REQUIREMENTS

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

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

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

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

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

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

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

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

**Territory:** Extremely defensive of nest area. Vociferous; will strike intruders, including humans. Territory estimated to be 1.6 to 39 km<sup>2</sup> (0.6 to 15 mi<sup>2</sup>) (Brown and Amadon 1968). Averaged 2.1 km<sup>2</sup> (0.8 mi<sup>2</sup>) in Wyoming (Craighead and Craighead 1956). Distances of 2.9 to 5.6 km (1.8 to 3.5 mi) have been reported between nesting pairs.

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

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

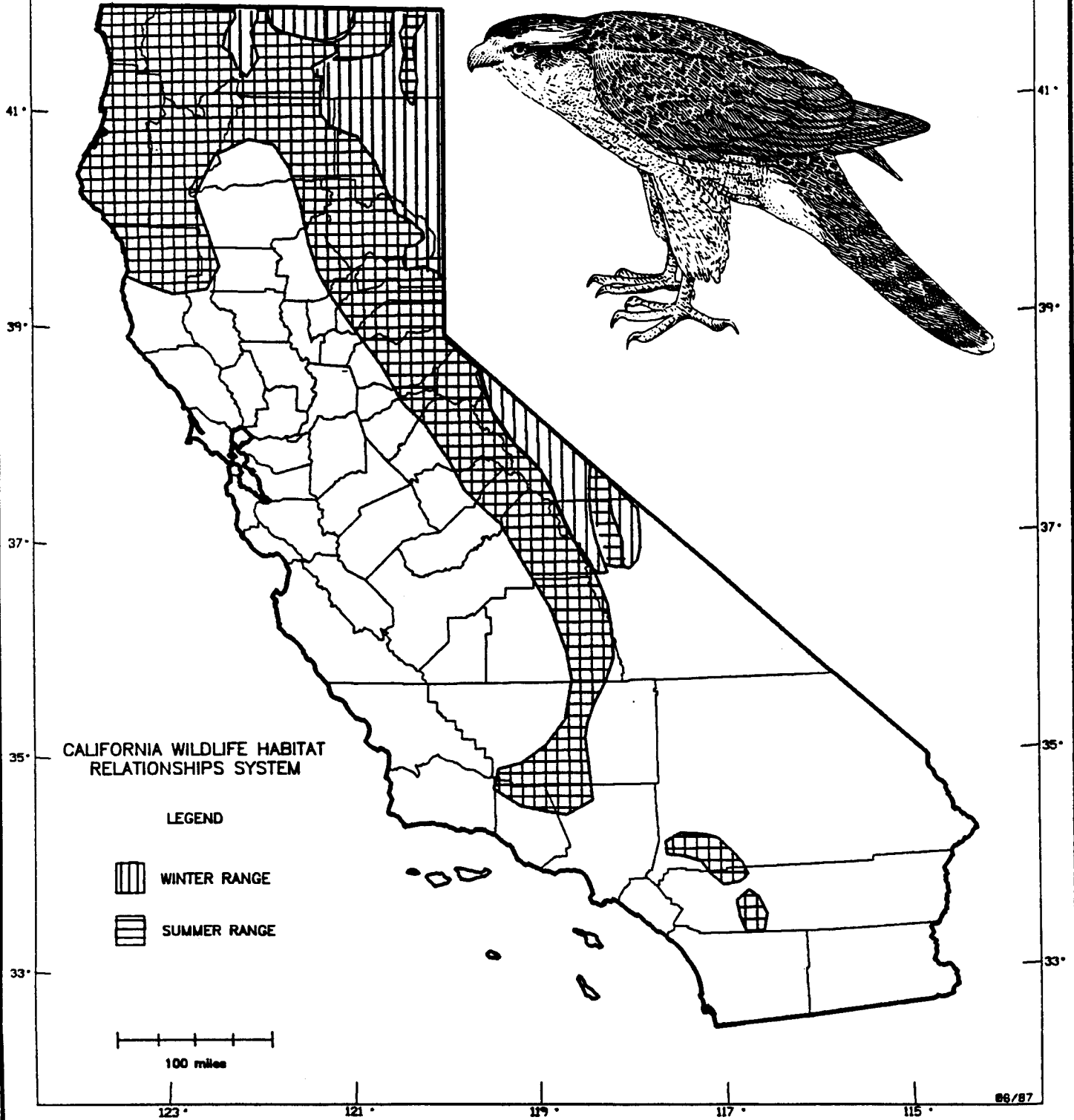
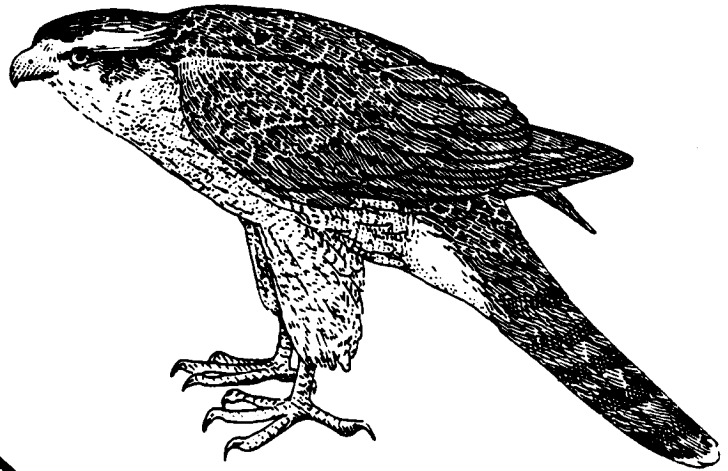
**Comments:** A California Species of Special Concern (Remsen 1978).

## REFERENCES

Bent 1937, Bond 1942, Grinnell and Miller 1944, Craighead and Craighead 1956, Schnell 1958, Brown and Amadon 1968, Jackman and Scott 1975, Reynolds 1975, 1979, Udvardy 1977, Harrison 1978, Mallette and Gould 1978, Remsen 1978, Bertrand and Scott 1979, Jones 1979, Shuster 1980, Reynolds *et al.* 1982.

# NORTHERN GOSHAWK

Species Note Prepared By: C. Polite, J. Pratt  
Species Note Edited By: S. F. Bailey, P. Bloom  
Species Note Reviewed By: S. F. Bailey



# B115 Sharp-shinned Hawk *Accipiter striatus*

Family: Accipitridae Order: Falconiformes Class: Aves

Management Status: California Species of Special Concern Date: February 1, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Fairly common migrant and winter resident throughout California, except in areas with deep snow. Breeding distribution poorly documented. Very few breeding records for Cascades/Sierra Nevada. Probably breeds south in Coast Ranges to about 35° lat., and at scattered locations in the Transverse and Peninsular Ranges. May no longer breed in the southern Sierra Nevada. Uncommon winter migrant to Channel Islands. Uncommon permanent resident and breeder in mid-elevation habitats. Breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers, but not restricted to, riparian habitats. North-facing slopes, with plucking perches are critical requirements. All habitats except alpine, open prairie, and bare desert used in winter.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Eats mostly small birds, usually no larger than jays; also takes small mammals, insects, reptiles, and amphibians. Perches, and darts out in sudden flight to surprise prey; also cruises rapidly in search flights. Often hunts as a harrier, in low, gliding flights. Often forages in openings at edges of woodlands, hedgerows, brushy pastures, and shorelines, especially where migrating birds are found.

**Cover:** Roosts in intermediate to high-canopy forest. Nests in dense, even-aged, single-layered forest canopy. Winters in woodlands.

**Reproduction:** Usually nests in dense, pole and small-tree stands of conifers, which are cool, moist, well shaded, with little ground-cover, near water. Nest is a platform or cup in dense foliage against trunk, or in main crotch of tree, usually 2-24 m (6-80 ft) above ground. Most inconspicuous nest of the accipiters (Call 1978).

**Water:** Nest usually located within 90 m (275 ft) of water. Captive individuals drink (Brown and Amadon 1968).

**Pattern:** Uses dense stands in close proximity to open areas.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Some individuals migrate into California for winter. Others migrate to mountains for summer and downslope to foothills and valleys for winter.

**Home Range:** In Wyoming, Craighead and Craighead (1956) measured 2 breeding home ranges of 67 ha and 132 ha (166 and 326 ac). Reynolds (1979) reported crude home range of 2750 ha (6600 ac).

**Territory:** Appears to be same as home range. Distances averaged 4.1 km (2.5 mi) between nests. Very active nest defense.

**Reproduction:** Breeds April through August; peak late May to July. Clutch averages 4-5 eggs; range 3-8. Incubation 34-35 days, by both parents. Male brings food to female and semi-altricial young; fledging occurs at about 60 days. Among 11 pairs in Oregon, Reynolds (1975) reported 2.7 young/ pair, and a hatching success of 70%. Egg loss was greater than nestling loss. Nests may be reused in later years.

**Niche:** Fledging is timed to coincide with fledging of prey birds, providing a food supply for young, inexperienced hunters. An important predator of small birds. May compete with Cooper's hawk.

**Comments:** A California Species of Special Concern (Remsen 1978). The least common breeding accipiter in California. Current breeding status in doubt; needs investigation.

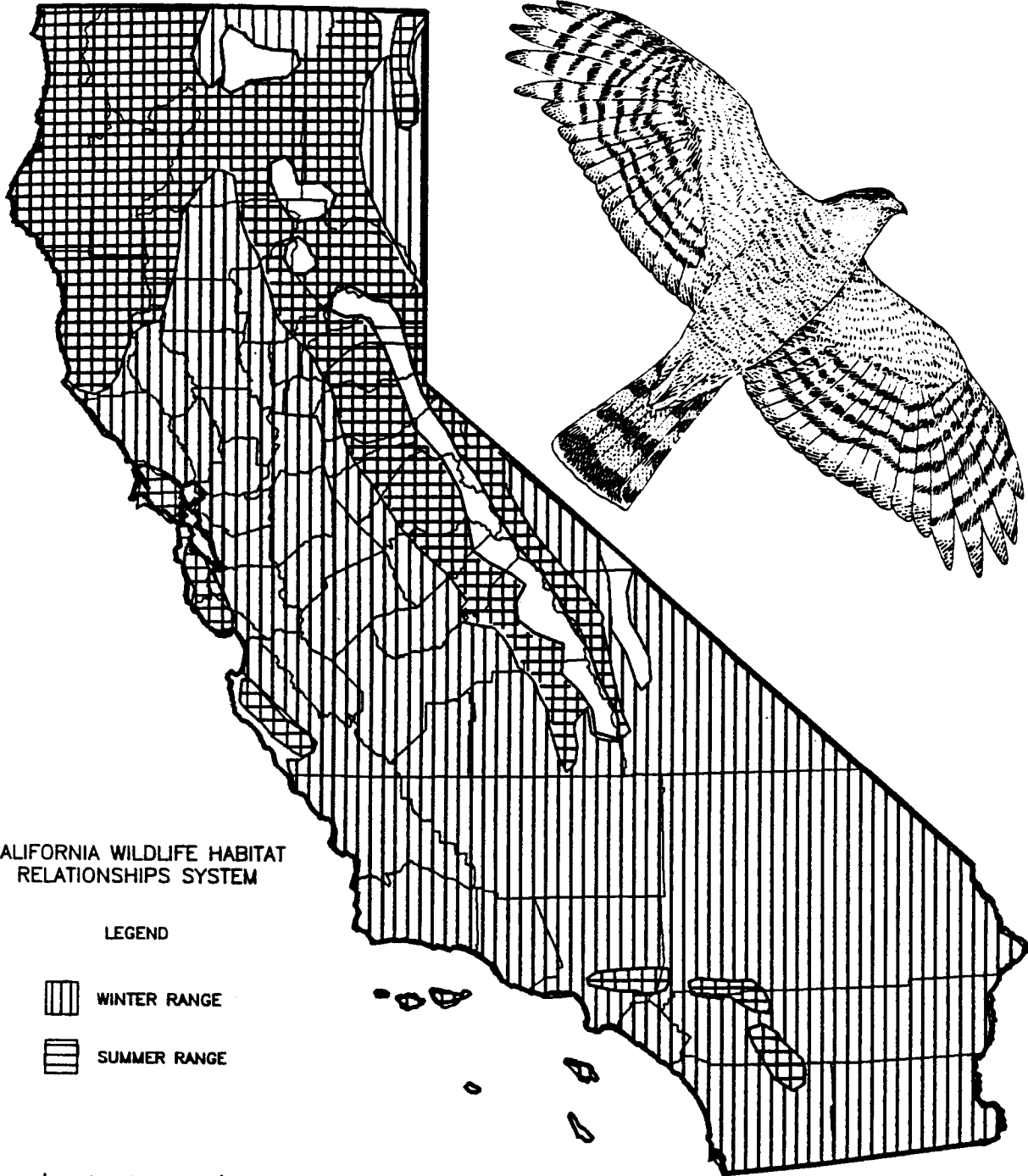
## REFERENCES

Craighead and Craighead 1956, Brown and Amadon 1968, Reynolds 1975, 1979, Call 1978, Remsen 1978, Reynolds *et al.* 1982.

# SHARP-SHINNED HAWK

## AUTHORSHIP

Species Note Prepared By: C. Polite, J. Pratt  
Species Note Edited By: S. F. Bailey  
Species Note Reviewed By: S. F. Bailey



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

86/87

# B116 Cooper's Hawk *Accipiter cooperii*

Family: Accipitridae Order: Falconiformes Class: Aves

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A breeding resident throughout most of the wooded portion of the state. Breeds in southern Sierra Nevada foothills, New York Mts., Owens Valley, and other local areas in southern California. Ranges from sea level to above 2700 m (0-9000 ft). Dense stands of live oak, riparian deciduous, or other forest habitats near water used most frequently.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Catches small birds, especially young during nesting season, and small mammals; also takes reptiles and amphibians. Hunts in broken woodland and habitat edges; catches prey in air, on ground, and in vegetation. Often dashes suddenly from perch in dense cover and pursues prey in air through branches. Sometimes runs prey down in dense thickets. Uses cover to hide, attack, and approach prey; also soars and makes low, gliding search flights.

**Cover:** Seldom found in areas without dense tree stands, or patchy woodland habitat.

**Reproduction:** Nests in deciduous trees in crotches 3-23 m (10-80 ft), but usually 6-15 m (20-50 ft), above the ground. Also nests in conifers on horizontal branches, in the main crotch, often just below the lowest live limbs. Nest is a stick platform lined with bark. Usually nests in second-growth conifer stands, or in deciduous riparian areas, usually near streams.

**Water:** Nesting and foraging usually occur near open water or riparian vegetation. Wetting or drowning of prey has been described.

**Pattern:** Frequents landscapes where wooded areas occur in patches and groves (Beebe 1974). Often uses patchy woodlands and edges with snags for perching. Dense stands with moderate crown-depths used for nesting.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Mostly a yearlong resident. Some from more northern areas migrate into California; also moves downslope and south from areas of heavy snow in autumn and returns in spring.

**Home Range:** In Michigan, Craighead and Craighead (1956) measured 4 home ranges that averaged 311 ha (768 ac) and varied from 96-401 ha (237-992 ac); they estimated that 17 other home ranges averaged 207 ha (512 ac), and varied from 18-531 ha (45-1312 ac). They reported 1 home range in Wyoming of 205 ha (506 ac).

**Territory:** Males defend an area about 100 m (330 ft) around potential nest sites prior to pair formation (Brown and Amadon 1968). Nests in Oregon were 3.2 to 4.2 km (2 to 2.6 mi) apart (Jackman and Scott 1975). Elsewhere, nests have been reported 1.6 to 2.4 km (1 to 1.5 mi) apart (Meng 1951, Brown and Amadon 1968). Of 77 territories in California, in oak stands, mean distance between nests was 2.6 km (1.6 mi).

**Reproduction:** Breeds March through August; peak activity May through July. Single-brooded; clutch size 2-6, usually 4-5. Female incubates 35-65 days (Brown and Amadon 1968); male provides food during this period. Young altricial; yearly fledgling success is about 2 young/pair (Craighead and Craighead 1956).

**Niche:** An important predator of small birds. Nestlings and immatures not yet skilled at catching prey may be killed by ravens, northern goshawks, and great horned owls (Beebe 1974). May compete, to a limited extent, with sharp-shinned hawks and northern goshawks.

**Comments:** A California Species of Special Concern (Remsen 1978). Breeding numbers reduced in recent decades.

## REFERENCES

Bent 1937, Meng 1951, Craighead and Craighead 1956, Brown and Amadon 1968, Henny and Wight 1972, Beebe 1974, Jackman and Scott 1975, Reynolds 1975, Udvardy 1977, Harrison 1978, Remsen 1978, Garrett and Dunn 1981.

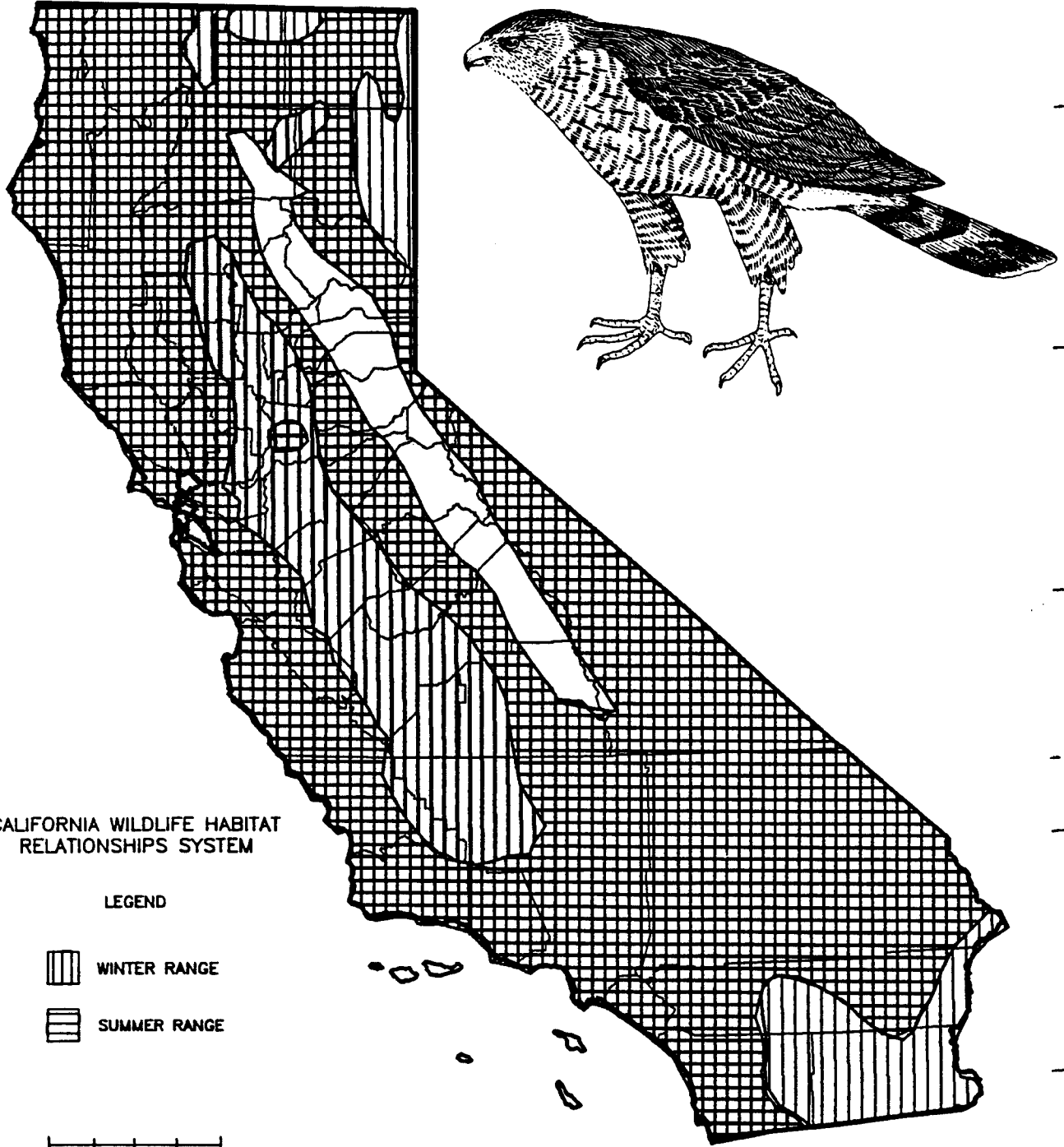
# COOPER'S HAWK

## AUTHORSHIP

Species Note Prepared By: C. Polite

Species Note Edited By: L. Kiff

Species Note Reviewed By: L. Kiff

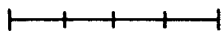


CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

 WINTER RANGE

 SUMMER RANGE

  
100 miles

06/87

# B119 Red-shouldered Hawk *Buteo lineatus*

Family: Accipitridae Order: Falconiformes Class: Aves Date: February 10, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Locally uncommon to common yearlong resident the length of the state along coast, and in Central Valley. Uncommon, even in suitable habitat in western Sierra Nevada foothills. Fairly common resident in woodlands west of southern desert region (Garrett and Dunn 1981). Frequents low-elevation riparian woodlands, up to 1500 m (5000 ft), especially where interspersed with swamps and emergent wetlands.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Forages mostly along edges of wet meadows, swamps, and emergent wetlands. In western Sierra Nevada foothills, feeds in early successional stages of valley foothill hardwood and valley foothill hardwood-conifer habitats. Diet highly varied; eats small mammals, snakes, lizards, amphibians, small or young birds, and large insects. Searches for prey from perches on trees, snags, and posts. Pounces from a perch, or glides and searches, mainly below tree canopy.

**Cover:** Primarily uses tree foliage in riparian deciduous habitats for cover.

**Reproduction:** Nests in dense riparian habitats. Builds a nest of sticks about half way up in a tall tree. Nest height averages 15 m (50 ft) (range 6-24 m, 20-80 ft). Nest located next to main tree trunk, or on old nests of squirrels, hawks, or crows; lined with strips of bark, dry leaves, and sprigs of evergreens (Call 1978).

**Water:** Nests near permanent water. Has been reported bathing (Bent 1937).

**Pattern:** Typical habitat includes dense riparian areas, with adjacent edges, swamps, marshes, and wet meadows for hunting.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Mostly resident in California. Some northern populations migrate for winter.

**Home Range:** In Michigan, 42 breeding home ranges averaged 63 ha (156 ac), and varied from 7.7 to 155 ha (19-384 ac) (Craighead and Craighead 1956). In Maryland, home range averaged about 194 ha (480 ac) (Stewart 1949). In Michigan, 3 winter ranges averaged 339 ha (838 ac), and varied from 127-503 ha (313-1242 ac). One closely studied individual maintained a daily range of only 43 ha (160 ac), which included 5 frequented perches (Craighead and Craighead 1956).

**Territory:** Territory apparently same as home range. Displays territoriality against conspecifics, red-tailed hawks, and golden eagles (Brown and Amadon 1968).

**Reproduction:** Breeds February through July, with peak activity April and May. Clutch size 1-5 eggs, usually 3.

**Niche:** Old nests often used by long-eared owls. Population has declined in recent decades with loss of riparian habitats. Young may be preyed upon by great horned owls.

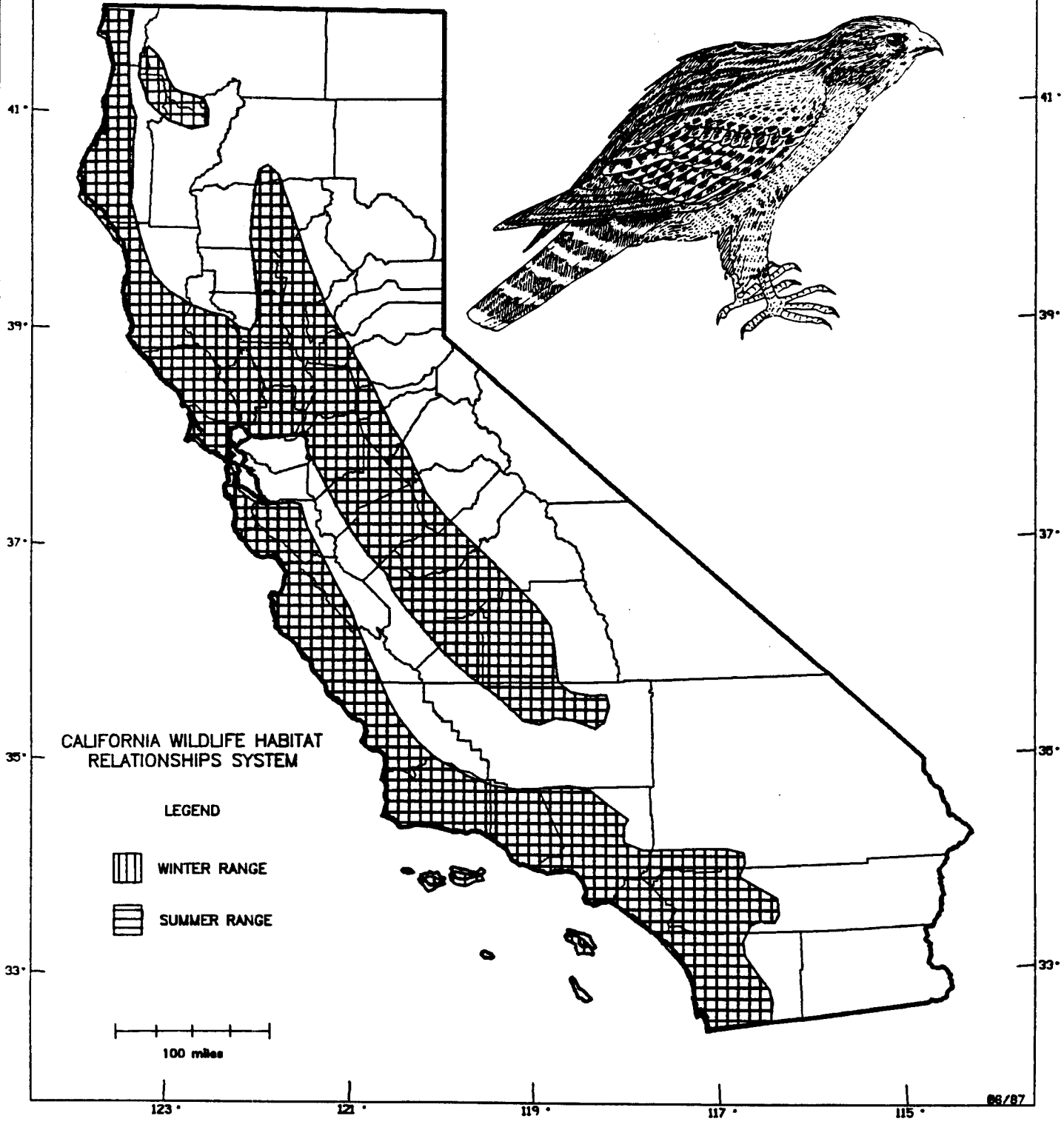
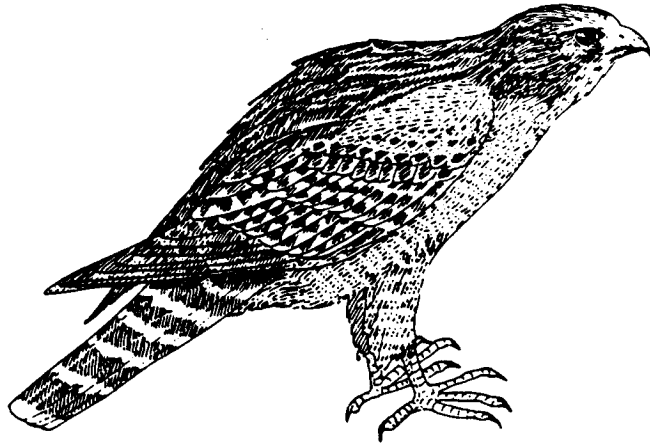
## REFERENCES

Bent 1937, Grinnell and Miller 1944, Stewart 1949, Craighead and Craighead 1956, Brown and Amadon 1968, Wilbur 1973, Wiley 1975a, 1975b, Call 1978, Garrett and Dunn 1981.

# RED-SHOULDERED HAWK

## AUTHORSHIP

Species Note Prepared By: C. Polite  
Species Note Edited By: S. F. Bailey, P. Bloom  
Species Note Reviewed By: S. F. Bailey





# B114 Northern Harrier *Circus cyaneus*

Family: Accipitridae Order: Falconiformes Class: Aves

Management Status: California Species of Special Concern Date: February 2, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Occurs from annual grassland up to lodgepole pine and alpine meadow habitats, as high as 3000 m (10,000 ft). Breeds from sea level to 1700 m (0-5700 ft) in the Central Valley and Sierra Nevada, and up to 800 m (3600 ft) in northeastern California. Frequents meadows, grasslands, open rangelands, desert sinks, fresh and water emergent wetlands; seldom found in wooded areas. Permanent resident of the northeastern plateau and coastal areas; less common resident of the Central Valley. Widespread winter resident and migrant in the Central Valley. California population has decreased in recent decades (Grinnell and Miller 1944, Remsen 1978), can be locally abundant where suitable habitat remains free of disturbance, especially from intensive agriculture. Breeding population much reduced, especially in southern coastal district. Destruction of natural habitat, native grassland, and moist meadows, burning and plowing of nesting areas during early stages of breeding cycle, are major reasons for the decline (Remsen 1978).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Feeds mostly on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects, and, rarely on fish. Makes low, quartering flights 1-9 m (3-30 ft) above open ground. Dives from flight or hover; rarely perches and pounces on prey.

**Cover:** Uses tall grasses and forbs in wetland, or at wetland/field border, for cover; roosts on ground.

**Reproduction:** Nests on ground in shrubby vegetation, usually at marsh edge (Brown and Amadon 1968). Nest built of a large mound of sticks on wet areas, and a smaller cup of grasses on dry sites. Mostly nests in emergent wetland or along rivers or lakes, but may nest in grasslands, grain fields, or on sagebrush flats several miles from water.

**Water:** No data found on water requirements, but frequents aquatic habitats. Home range usually includes fresh water.

**Pattern:** Mostly found in flat, or hummocky, open areas of tall, dense grasses, moist or dry shrubs, and edges for nesting, cover, and feeding.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Some individuals migrate into California; others migrate through to Central America or northern South America.

**Home Range:** In Utah, 5 breeding home ranges averaged 429 ha (1060 ac), and varied from 363-518 ha (896-1280 ac). In Michigan, individuals flew 1.6 to 8.8 km (1 to 5.5 mi) daily from a communal roost to foraging areas. Daily foraging areas varied from 12-16 ha (30-40 ac) to 259 ha (640 ac) (Craighead and Craighead 1956). Also in Michigan, 15 breeding home ranges averaged 405 ha (1000 ac), and varied from 98-770 ha (243-1920 ac). In Wisconsin, the breeding home range of 1 radio-tagged pair included an area 2 x 4.4 km (1.25 x 2.75 mi), or 890 ha (2200 ac) (Hamerstrom and Wilde 1973).

**Territory:** In Manitoba, territory extended 28 ha (96 ac) around nests (Hecht 1951). Very defensive of territory; will attack other, more formidable birds of prey, and humans during breeding season.

**Reproduction:** Breeds April to September, with peak activity June through July. Single-brooded; clutch averages 5 eggs, range 3-12. Female incubates while male provides food. Nestling period lasts about 53 days (Craighead and Craighead 1956). Breeding pair and juveniles may roost communally in late autumn and winter.

**Niche:** Competes with buteos, especially red-tailed and red-shouldered hawks, for food. Often considered a diurnal counterpart of the short-eared owl. Population may increase with some agricultural practices (e.g., grain crops), provided that cover and nesting habitat is preserved, or enhanced.

**Comments:** A California Species of Special Concern (Remsen 1978). Formerly called marsh hawk.

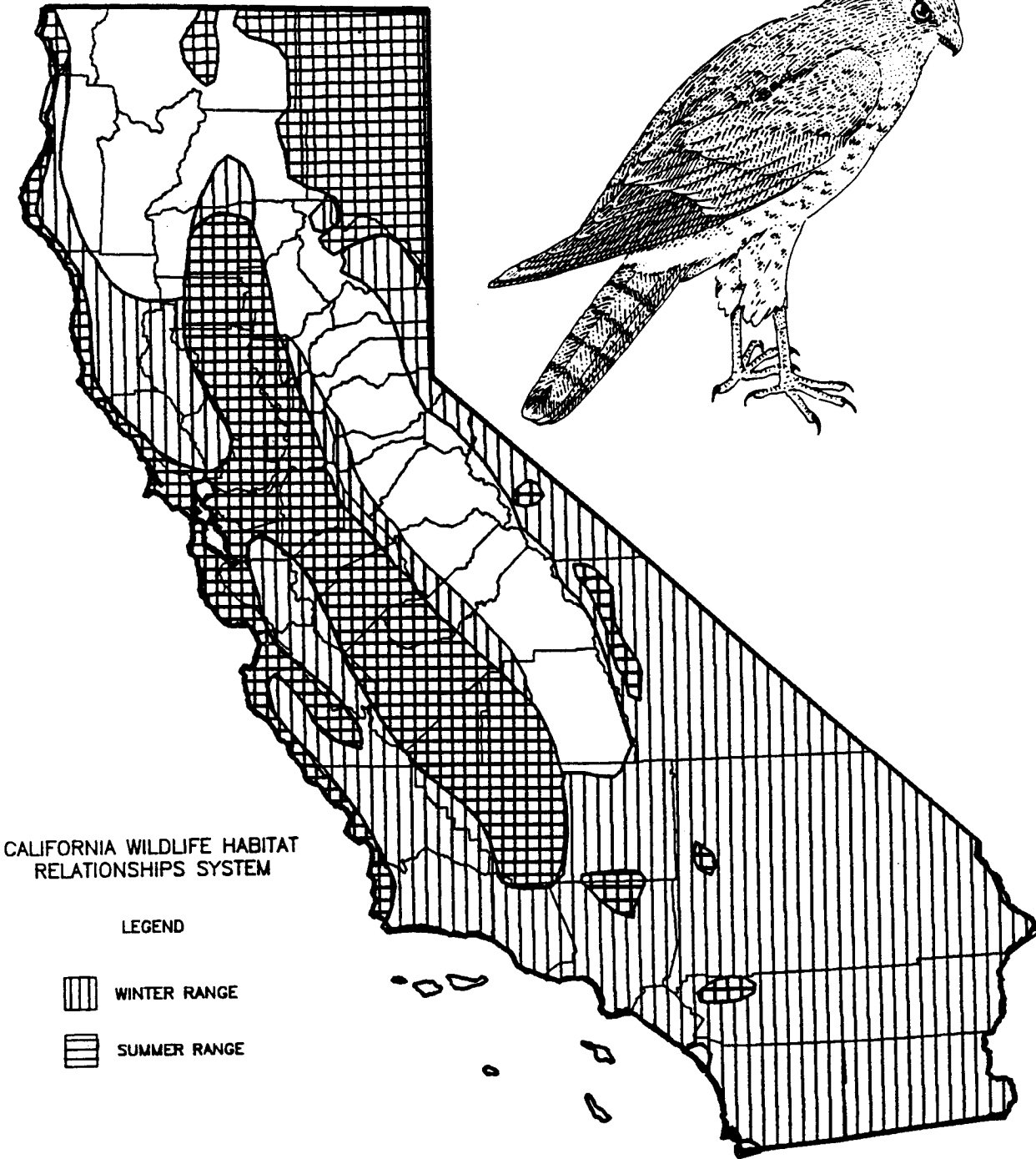
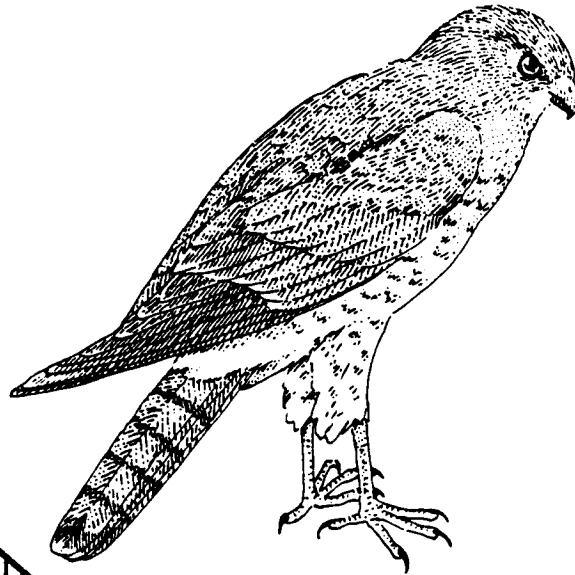
## REFERENCES

Bent 1937, Grinnell and Miller 1944, Hecht 1951, Craighead and Craighead 1956, Brown and Amadon 1968, Hamerstrom 1969, Hamerstrom and Wilde 1973, Smith and Murphy 1973, Udvardy 1977, Call 1978, Remsen 1978, Harrison 1978, Bertrand and Scott 1979.

# NORTHERN HARRIER

## AUTHORSHIP

Species Note Prepared By: C. Polite  
Species Note Edited By: S. F. Bailey  
Species Note Reviewed By: S. F. Bailey



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

86/87

# B110 Osprey *Pandion haliaetus*

**Family:** Accipitridae **Order:** Falconiformes **Class:** Aves  
**Management Status:** California Species of Special Concern  
**Date:** March 4, 1982

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Breeds in northern California from Cascade Ranges south to Lake Tahoe, and along the coast south to Marin Co. Regular breeding sites include Shasta Lake, Eagle Lake, Lake Almanor, other inland lakes and reservoirs, and northwest river systems. Breeding population estimated in 1975 at 350-400 pairs in northern California (Henny *et al.* 1978); numbers apparently increasing in recent years. An uncommon breeder along southern Colorado River, and uncommon winter visitor along the coast of southern California (Garrett and Dunn 1981). Associated strictly with large, fish-bearing waters, primarily in ponderosa pine through mixed conifer habitats.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Preys mostly on fish; also takes a few mammals, birds, reptiles, amphibians, and invertebrates. Requires open, clear waters for foraging. Uses rivers, lakes, reservoirs, bays, estuaries, and surf zones. Swoops from flight, hovers, or perches to catch fish near rface of water.

**Cover:** Uses large trees, snags, and dead-topped trees in open forest habitats for cover and nesting.

**Reproduction:** Nests on platform of sticks at the top of large snags, dead-topped trees, on cliffs, or on human-made structures. Nest may be as much as 71 m (250 ft) above ground. Occasionally nests on ground. Nest usually within 400 m (1312 ft) of fish-producing water, but may nest up to 1.6 km (1 mi) from water (Airola and Shubert 1981). Needs tall, open-branched "pilot trees" nearby for landing before approaching the nest, and for use by young for flight practice. Nest tree averaged 172 cm (68 in) dbh (range 76-206 cm; 30-81 in dbh) in northern California. Nest height averaged 41 m (135 ft) (Airola and Shubert 1981).

**Water:** Clear, open waters required for foraging. Some individuals bathe (Bent 1937).

**Pattern:** Uses large snags and open trees near large bodies of water.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Arrives on nesting grounds mid-March to early April. Migrates south along coast and western slope of Sierra Nevada in October to Central and South America.

**Home Range:** Travels up to 8-10 km (5-6 mi) from nest to fishing areas (Garber 1972, French and Koplín 1977).

**Territory:** In Montana, Flath (1972) observed that an area of 230 m<sup>2</sup> (1700 ft<sup>2</sup>) around nest site was defended against Canada geese. In Florida, nests and immediate vicinity were defended; nests were as close as 20 m (66 ft) from each other (Ogden 1975). Pair defends nest, sometimes violently, when young present (Call 1978).

**Reproduction:** Breeds March to September. Clutch size 1-4 eggs, usually 3. Colonial nesting common. Young breed first at 3 yr. Pesticides caused reproductive failure in past (Garber 1972), but reproductive success has increased since early 1970s (Airola and Shubert 1981).

**Niche:** Bald eagles and gulls compete with osprey for food, often stealing osprey catch.

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

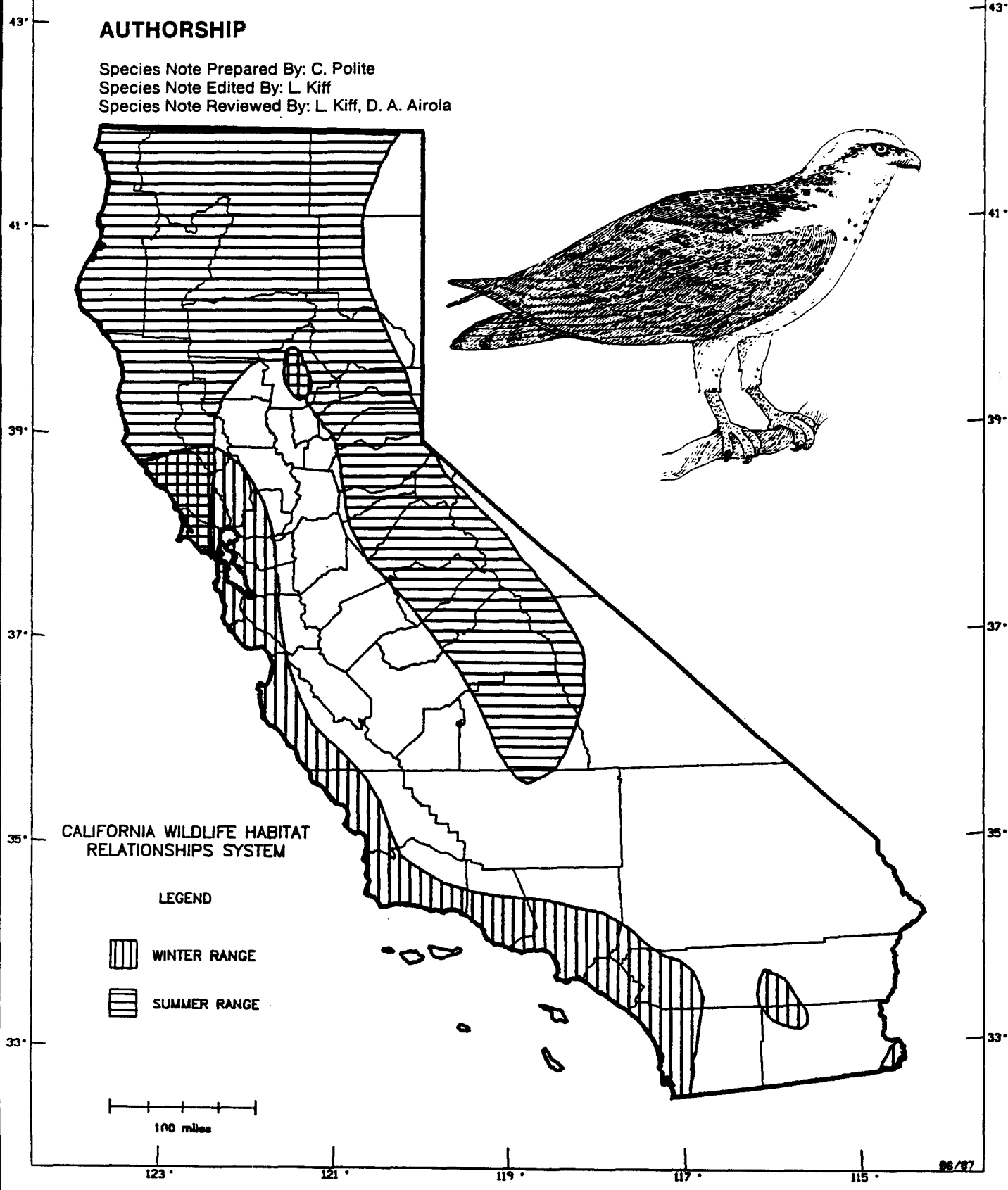
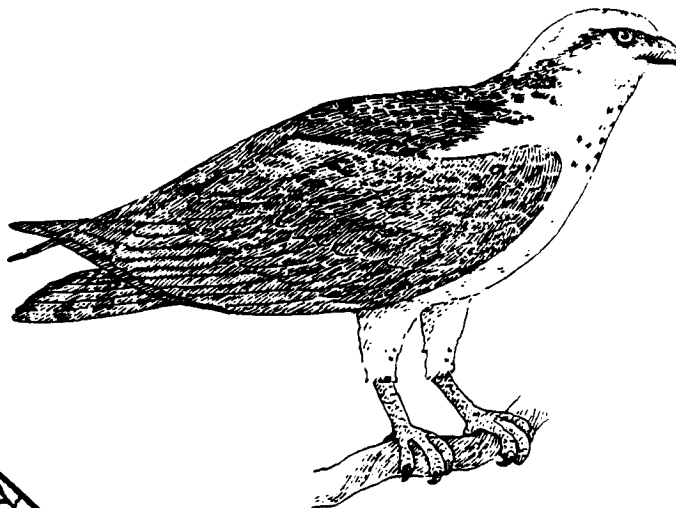
## REFERENCES

Bent 1937, Grinnell and Miller 1944, Brown and Amadon 1968, Koplín 1971, Flath 1972, Garber 1972, Zarn 1974b, Jackman and Scott 1975, French and Koplín 1977, Ogden 1977, Call 1978, Henny *et al.* 1978, Remsen 1978, Airola and Shubert 1981, Garrett and Dunn 1981.

# OSPREY

## AUTHORSHIP

Species Note Prepared By: C. Polite  
Species Note Edited By: L. Kiff  
Species Note Reviewed By: L. Kiff, D. A. Airola



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

08/87

# B128 Merlin *Falco columbarius*

Family: Falconidae Order: Falconiformes Class: Aves

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon winter migrant from September to May. Seldom found in heavily wooded areas, or open deserts. Frequents coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, edges, and early successional stages. Ranges from annual grasslands to ponderosa pine and montane hardwood-conifer habitats. Occurs in most of the western half of the state below 1500 m (3900 ft). A rare winter migrant in the Mojave Desert; a few records from the Channel Islands. Numbers have declined markedly in California in recent decades.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Feeds primarily on small birds; also small mammals and insects. Frequents shorelines in winter and catches shorebirds. Searches while flying at low level; attacks with a short dive, or dash from above. Captures prey on ground or in air, after direct pursuit. Young may rely upon insects while developing predatory skills.

**Cover:** Dense tree stands close to bodies of water are needed for cover. Uses a wide variety of habitats.

**Reproduction:** Does not breed in California. Breeds in Alaska and Canada. Builds an open platform of sticks in a tree, usually a conifer. Occasionally nests in cavities, cliffs, in a deserted building, on ground, or in an old nest of another bird (Craighead and Craighead 1956, Brown and Amadon 1968).

**Water:** Usually nests close to water.

**Pattern:** Frequents open habitats at low elevation near water and tree stands. Favors coastlines, lakeshores, wetlands.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Winters in California from September to May. Wanders in search of abundant prey. Some individuals migrate as far as South America in winter.

**Home Range:** No data found.

**Territory:** No data found on winter territory. Not rigidly territorial in nonbreeding season, but is intraspecifically aggressive.

**Reproduction:** Clutch of 4-5 eggs laid from late May into June. Incubates 28-32 days, and chicks fledge at about 24 days (Trimble 1972).

**Niche:** Because feeds mostly on birds, numbers probably have been reduced by pesticides. Potential avian predators are driven away as soon as they enter the territory; particularly intolerant of accipiters (Fox 1964, Bent 1938, Oliphant 1974).

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

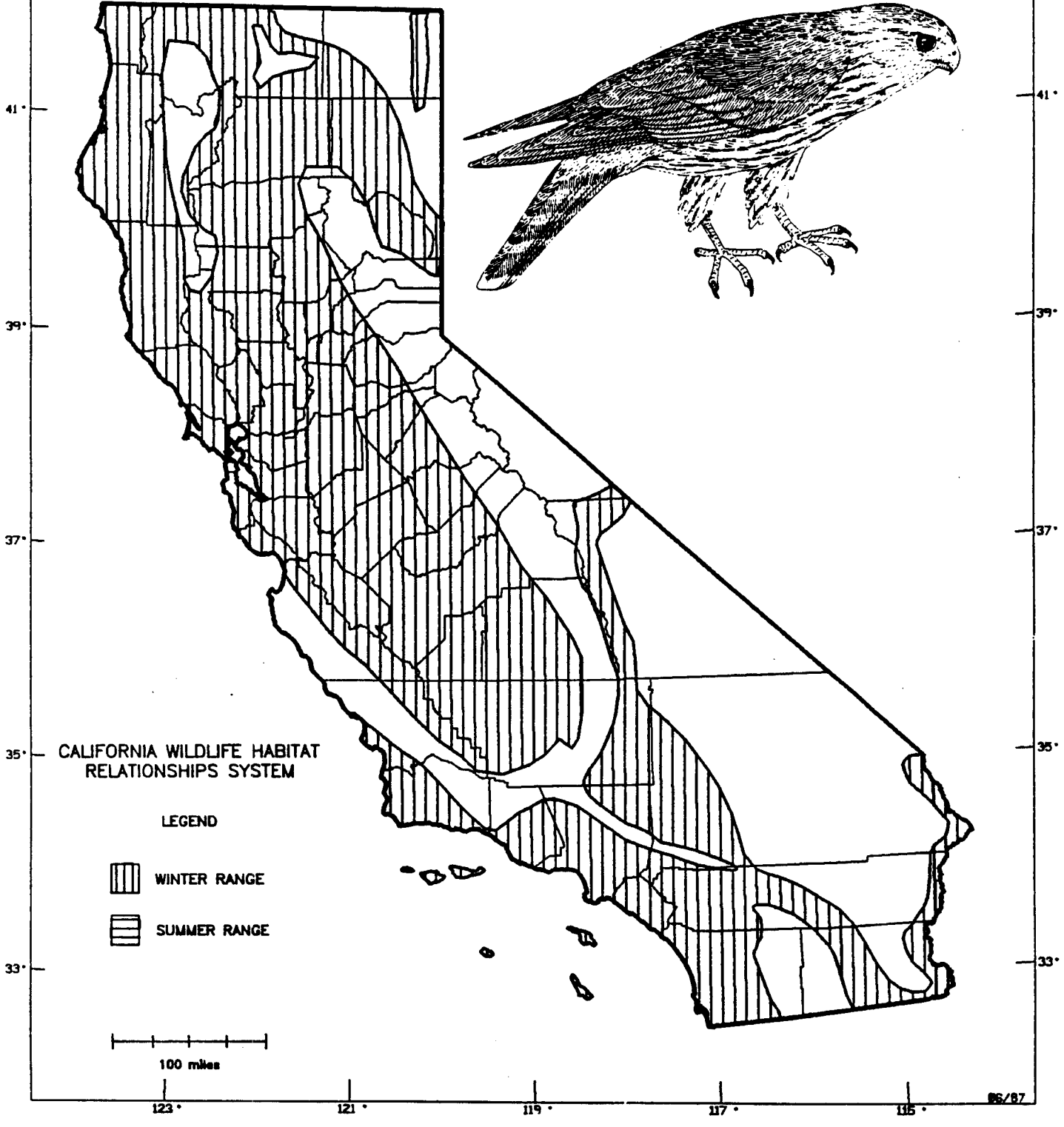
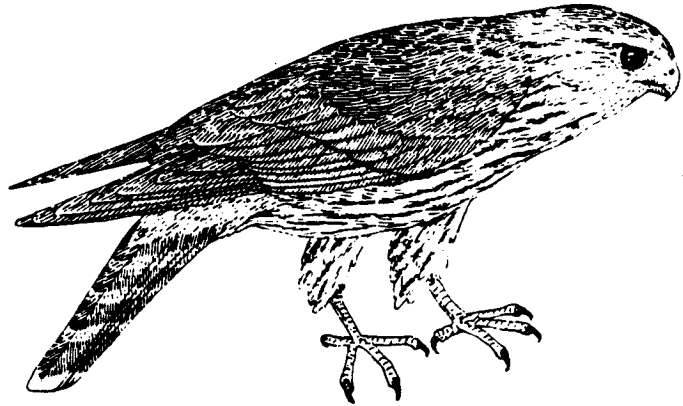
## REFERENCES

Bent 1938, Grinnell and Miller 1944, Craighead and Craighead 1956, Fox 1964, Brown and Amadon 1968, Trimble 1972, Oliphant 1974, Bayer 1977, Udvardy 1977, Harrison 1978, Remsen 1978, Bertrand and Scott 1979.

# MERLIN

## AUTHORSHIP

Species Note Prepared By: C. Polite  
Species Note Edited By: S. F. Bailey  
Species Note Reviewed By: S. F. Bailey



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

05/87

# B049 American Bittern *Botaurus lentiginosus*

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The American bittern is distributed widely in winter in fresh emergent wetlands, primarily west of the Sierra Nevada. In the Central Valley, fairly common October to April, uncommon to rare rest of year; although breeds there. Less common on coastal slope, and no longer breeds regularly south of Monterey Co. (Garrett and Dunn 1981). In Imperial Valley and along Colorado River, fairly common October to April, rare through summer, and may breed at northern end of Salton Sea. In north-east plateau and east of Sierra Nevada crest south to Lake Tahoe, rare May to August; breeds locally. Rare August to May in saline emergent wetlands along coast. Elsewhere in lowlands, a rare transient and local winter resident (Cogswell 1977, McCaskie *et al.* 1979, Garrett and Dunn 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Eats mainly insects, amphibians, fish, crayfish, and small mammals; also snakes, miscellaneous invertebrates, and birds. Feeds in tall, fresh or saline, emergent wetlands; less often in adjacent shallow water of lakes, backwaters of rivers, or estuaries; and occasionally along adjacent shores. Feeds most actively at dusk or at night (Terres 1980), but also apparently at any time of day. Stands motionless and waits for prey, or stalks very slowly; grasps prey in bill with a quick strike (Kushlan 1976b).

**Cover:** Usually hides, rests, and roosts solitarily amidst tall, dense, emergent vegetation, on ground, or near ground on log, stump, or on emergent plants. Does not normally perch in trees.

**Reproduction:** Nest is a platform of matted, emergent aquatics, other herbaceous stems, sticks and/or leaves, usually in shallow water, but sometimes floating, or on ground. It is concealed in tall, dense, fresh emergent vegetation.

**Water:** No additional data found.

**Pattern:** No additional data found.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, circadian feeder, but most activity is crepuscular and nocturnal.

**Seasonal Movements/Migration:** The small breeding population in lowlands may be nonmigratory; augmented during October to April by migrants, probably from north of California and from the northeastern plateau, which is deserted in winter by this species.

**Home Range:** No information found. In a slough in Saskatchewan, less than 16 ha (40 ac) in extent, there were 5 nests (Bent 1926). Distances between nests have been as little as 18 m (57 ft) in Michigan (Middleton 1949), 37 m (120 ft) in Iowa (Provost 1947), and 46 m (150 ft) in Minnesota (Vesall 1940).

**Territory:** Probably used mainly for courtship, copulation, and nesting; size unknown (Palmer 1962).

**Reproduction:** Timing of courtship and nest-building unknown; eggs or young reported April to July (Cogswell 1977). Possibly polygamous, based on minimal evidence. Basically a solitary nester, but often in vicinity of other pairs. Clutch size usually 3-5, range 2-6. Apparently single-brooded. Incubation about 24 days. Semi-altricial, downy hatchlings apparently tended solely by female, and remain in nest about 2 wk. Ages at first flight, independence, and first breeding are unknown (Palmer 1962).

**Niche:** Population has declined from draining of marshes, human disturbance, and pesticides (Arbib 1979); overgrazing of emergent vegetation also is detrimental.

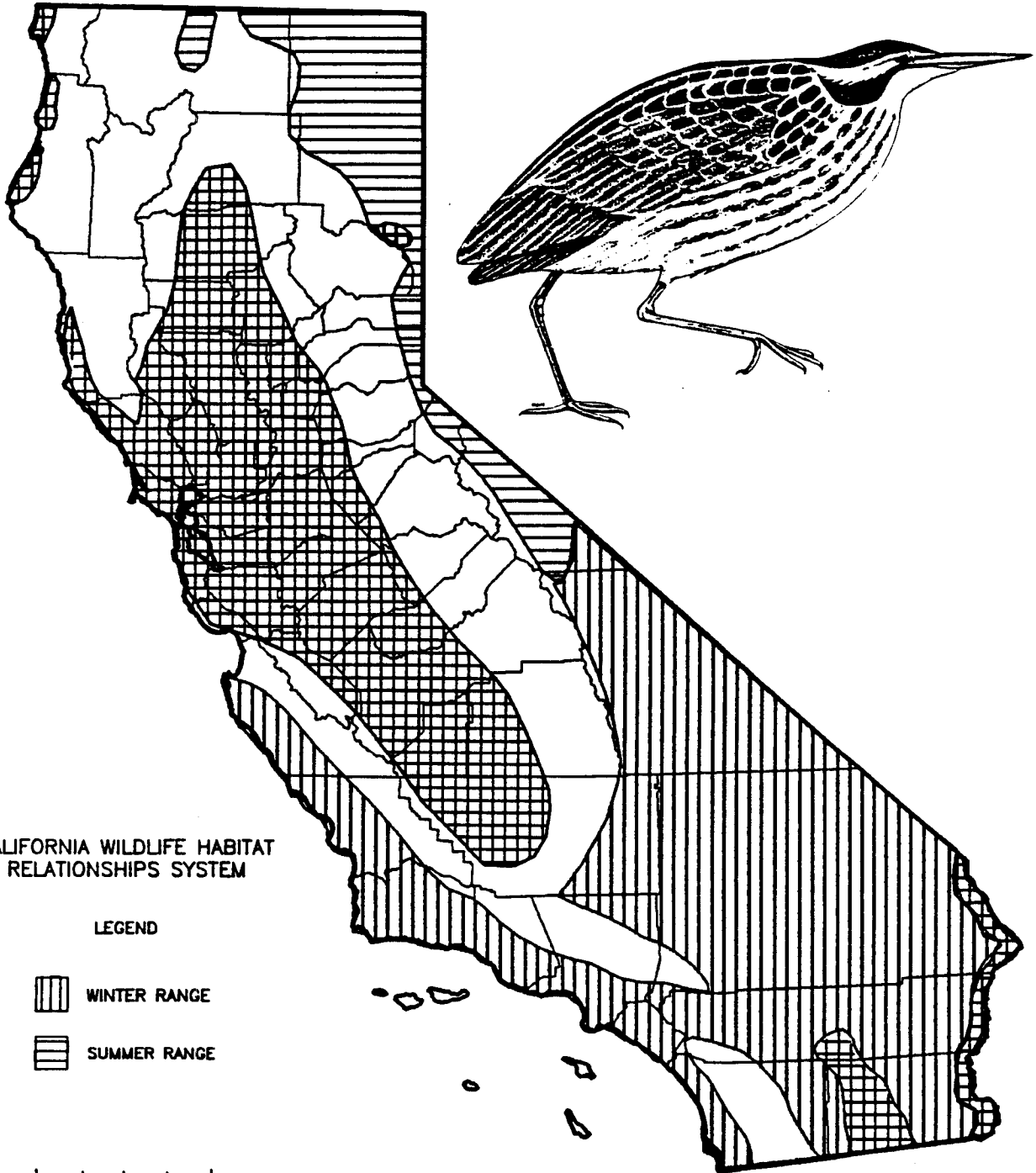
## REFERENCES

Bent 1926, Vesall 1940, Provost 1947, Middleton 1949, Palmer 1962, Yocom and Harris 1975, Kushlan 1976b, Cogswell 1977, Arbib 1979, McCaskie *et al.* 1979, Terres 1980, Garrett and Dunn 1981.

# AMERICAN BITTERN

## AUTHORSHIP

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Species Note Reviewed By: D. G. Raveling



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles



# B052 Great Egret *Casmerodius albus*

Family: Ardeidae Order: Ciconiiformes Class: Aves Date: September 22, 1983

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The great egret is a common yearlong resident throughout California, except for high mountains and deserts. Feeds and rests in fresh, and saline emergent wetlands, along the margins of estuaries, lakes, and slow-moving streams, on mudflats and salt ponds, and in irrigated croplands and pastures. Nests in large trees, and roosts in trees (Grinnell and Miller 1944, Cogswell 1977). In southern California, common all year, and breeds at Salton Sea and Colorado River. Fairly common in coastal lowlands September to April, rare in summer, and breeds in Riverside Co. (one small colony). Rare to uncommon in deserts, occurring mainly as a spring migrant (Garrett and Dunn 1981). In northern California, fairly common to common yearlong in coastal lowlands, inland valleys, and the Central Valley. Locally abundant March to July near the larger nesting colonies. Uncommon to fairly common March to August on the northeastern plateau, and nests locally (Cogswell 1977, McCaskie *et al.* 1979).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Feeds in shallow water and along shores of estuaries, lakes, ditches, and slow-moving streams, in salt ponds and mudflats, and in irrigated croplands and pastures. Eats mainly fishes, amphibians, snakes, snails, crustaceans, insects, and small mammals (Palmer 1962). Stands motionless or stalks slowly, then rapidly strikes prey with bill (Kushlan 1976a).

**Cover:** Roosts communally in trees. Rests in day in same habitats as it feeds.

**Reproduction:** In California, nests in large trees (Grinnell and Miller 1944), usually near water, at a height of 6-12 m (20-40 ft), but ranging from 3-24 m (10-80 ft). Nests often are sheltered from prevailing winds (Yull 1972, Ives 1973), and may be as high as 30 m (100 ft) (Pratt 1972). Nest is built of sticks and stems of marsh plants. Nesting colony must be isolated from human activities, or parents may abandon nests (Ives 1972, 1973, Cogswell 1977).

**Water:** No additional data found.

**Pattern:** Requires groves of trees suitable for nesting and roosting, relatively isolated from human activities, near aquatic foraging areas. May forage up to 32 km (20 mi) from nest, but usually much closer (Custer and Osborn 1978).

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Resident yearlong throughout most of its California range, but leaves the northeastern plateau September to February. From March to July, populations are concentrated near nesting colonies; after nesting, individuals disperse and wander widely.

**Home Range:** Breeding home range was 8-16 km (5-10 mi) radius around nest (Ives 1973, Yull 1972). Winter home range was the same, centered around roost (Yull 1972). In North Carolina, foraged up to 32 km (20 mi) from nest (Custer and Osborn 1978).

**Territory:** Breeding territory is limited to the immediate vicinity of nest, and is used for courtship and copulation as well as nesting. Separate feeding territory is defended against all smaller species of herons (Palmer 1962). Nests in Marin Co. were spaced just beyond reaching distance of sitting individuals (Pratt 1970). In Louisiana, unpaired individuals defended "large" territories, which gradually shrank to a mean of 4 m<sup>2</sup> (43 ft<sup>2</sup>) after pairing (Wiese 1976). In California, defended 100-200 m (328-656 ft) of ditch as feeding territories (Schlorff 1978).

**Reproduction:** Nests mainly March to July; May to July on northeastern plateau (Cogswell 1977). A monogamous, colonial nester. Clutch size usually 3-5, range 2-6. Probably single-brooded, with incubation lasting 26 days (Maxwell and Kale 1977). Semi-altricial, downy young fed by both parents. Age at first flight probably 5-6 wk, but there is no information on ages at independence or first breeding (Palmer 1962).

**Niche:** Defends feeding territory against smaller herons, but may be driven away by great blue heron (Palmer 1962). In California, often nests in mixed colonies with great blue herons. Intrusions of humans into nesting colonies often cause parents to desert nests; many former nesting colonies have been abandoned (Cogswell 1977). High winds often destroy eggs, nests, and nestlings (Page 1971, Ives 1972). Eggshell thinning from pesticides may reduce breeding success (Ives 1972). Wetland drainage has markedly reduced available habitat.

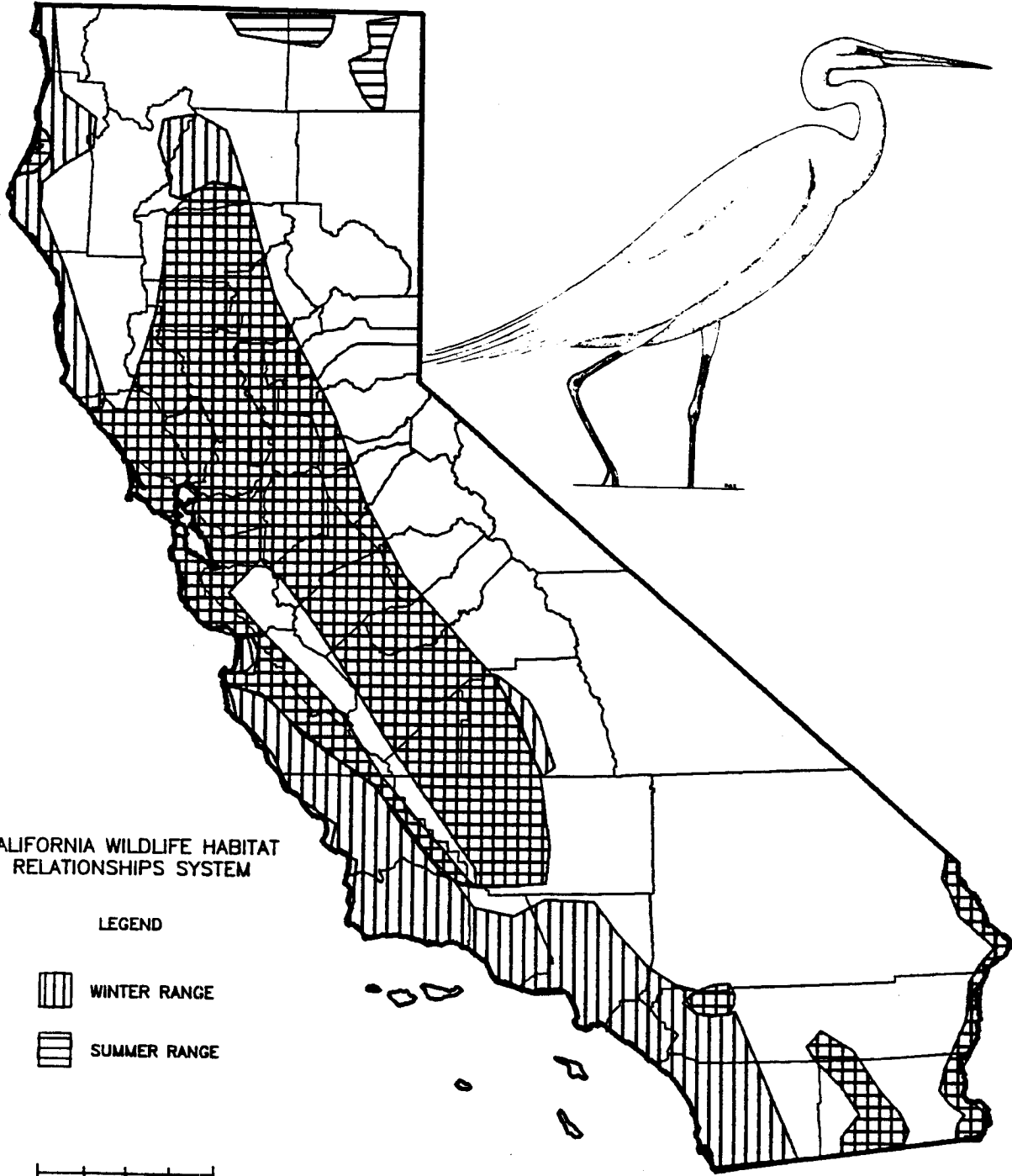
## REFERENCES

Grinnell and Miller 1944, Palmer 1962, Pratt 1970, 1972, Page 1971, Ives 1972, 1973, Yull 1972, Kushlan 1976a, Wiese 1976, Cogswell 1977, Maxwell and Kale 1977, Custer and Osborn 1978, Schlorff 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981.

# GREAT EGRET

## AUTHORSHIP

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



# B051 Great Blue Heron *Ardea herodias*

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The great blue heron is fairly common all year throughout most of California, in shallow estuaries and fresh and saline emergent wetlands. Less common along riverine and rocky marine shores, in croplands, pastures, and in mountains above foothills. Common July to October in salt ponds where fish are numerous (Cogswell 1977). Locally common near rookeries February to June or July. Few rookeries are found in southern California, but many are scattered throughout northern California; knowledge of their locations is incomplete (Malette 1972, Belluomini 1978, Garrett and Dunn 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Nearly 75% of the diet is fish, mostly species not sought by humans (Cogswell 1977); also eats small rodents, amphibians, snakes, lizards, insects, crustaceans, and occasionally small birds. Stands motionless, or walks slowly, when searching for prey in shallow water (less than 30 cm; 12 in) or, less commonly, in open fields. In a pond in Florida, fed mostly in open water rather than among emergent vegetation (Kushlan 1976b). Grasps prey in bill, rarely impaling. Parents regurgitate food for nestlings.

**Cover:** Perches and roosts in secluded tall trees. Also perches on kelp beds offshore.

**Reproduction:** Usually nests in colonies in tops of secluded large snags or live trees, usually among the tallest available; rarely nests on ground, rock ledges, sea cliffs, mats of tules, or shrubs. Colonies should be protected from human disturbances, which often cause nest desertion (Ives 1972, Gould 1974, Jackman and Scott 1975).

**Water:** No additional information found.

**Pattern:** For nesting, prefers secluded groves of tall trees near shallow-water feeding areas, but feeding area may be up to 16 km (10 mi) distant (Krebs 1974).

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong, feeding both night and day, but most active around dawn and dusk (Terres 1980).

**Seasonal Movements/Migration:** In June or July, after breeding, disperses from nesting colonies to outlying areas, but there is little regular migration (Gill and Mewaldt 1979); many depart from northeastern California and east of the Sierra Nevada in winter.

**Home Range:** In British Columbia, breeders flew up to 16 km (10 mi) from nest (Krebs 1974).

**Territory:** Breeding territory includes only the nest and immediate surroundings (Cottrille and Cottrille 1958, Mock 1976). Nests in Marin Co. were spread as far apart as sitting birds could reach (Pratt 1970). Feeding territories may be defended (Palmer 1962, Krebs 1974, Kushlan 1976b), particularly in the nonbreeding season.

**Reproduction:** Usually arrives on breeding grounds in February. Courtship and nest-building begin shortly thereafter, and eggs are laid in late February or March. Monogamous, and usually nests in colonies, sometimes with 5, or more, pairs, but often fewer; and occasionally nests solitarily. Clutch size 1-8, but usually 3-4. Single-brooded. Incubation lasts about 28 days. Semi-altricial, downy young are cared for by both parents. Young may fly by 7 wk, but still return to the nest for 2-3 wk, and may be fed by parents until 11 wk old (Pratt 1970). In Marin and Humboldt cos., most fledglings left nests in June and July, but some left as late as September (Pratt 1970, Ives 1972). At high elevations, breeding phenology may be delayed a month, or more. Reportedly breeds first at 2 yr.

**Niche:** In California, often nests in mixed colonies with great egrets. Old nests sometimes reused by great horned owls, long-eared owls, and other birds. In a Placer Co. breeding colony, the only avian predator apparently was the golden eagle; other large raptors and corvids were ignored (Wilburn 1971). Sensitive to human disturbance near nests, and probably to pesticides and herbicides in nesting and foraging areas (Jackman and Scott 1975). Populations in California increased between 1970 and 1978 (Belluomini 1978).

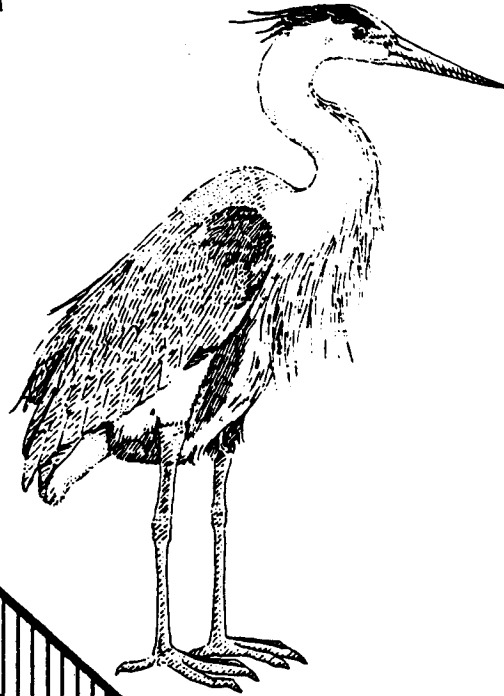
## REFERENCES

Cottrille and Cottrille 1958, Palmer 1962, Pratt 1970, Wilburn 1971, Ives 1972, Malette 1972, Gould 1974, Krebs 1974, Jackman and Scott 1975, Kushlan 1976a, 1976b, Mock 1976, Cogswell 1977, Willard 1977, Belluomini 1978, Gill and Mewaldt 1979, Terres 1980, Garrett and Dunn 1981.

# GREAT BLUE HERON

## AUTHORSHIP

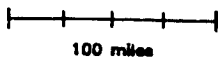
Species Note Prepared By: S. L. Granholm  
Species Note Edited By: R. Duke  
Species Note Reviewed By: L. R. Mewaldt, D. A. Airola



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE



# B059 Black-crowned Night-Heron *Nycticorax nycticorax*

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The black-crowned night-heron is a fairly common, yearlong resident in lowlands and foothills throughout most of California, including the Salton Sea and Colorado River areas, and very common locally in large nesting colonies. Feeds along the margins of lacustrine, large riverine, and fresh and saline emergent habitats and, rarely, on kelp beds in marine subtidal habitats. Nests and roosts in dense-foliaged trees and dense emergent wetlands. Common nesting species on northeastern plateau from April to August. Uncommon in northwestern, and rare in northeastern, California in midwinter. Uncommon transient and rare in winter in southern deserts, and rare on Channel Islands. Seldom seen in mountains, but formerly nested at Big Bear Lake in San Bernardino Mts. (Cogswell 1977, McCaskie *et al.* 1979, Garrett and Dunn 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Feeds mostly nocturnally and crepuscularly. Highly variable diet consists of fishes, crustaceans, aquatic insects and other invertebrates, amphibians, reptiles, small mammals, and rarely young birds (Palmer 1962, Wolford and Boag 1971b). Collins (1970) and Hunter and Morris (1976) reported feeding on young terns. Usually hunts in shallow water, waiting motionlessly or, less commonly, stalking prey slowly (Kushlan 1976a). Sometimes vibrates bill to lure or flush prey, and may alight briefly on deep water to make a strike.

**Cover:** Roosts among dense foliage of trees, not always near water, and in dense, fresh or brackish emergent wetlands (Grinnell and Miller 1944). Often rests on piers and pilings.

**Reproduction:** Nests in dense-foliaged trees, dense, fresh or brackish emergent wetlands, or dense shrubbery or vine tangles, usually near aquatic or emergent feeding areas. Nests are built of twigs and/or marsh plants.

**Water:** No additional data found.

**Pattern:** Nest-sites usually near aquatic or emergent feeding areas, but nonbreeding-season roosts may be farther away.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, crepuscular and nocturnal activity. Sometimes also feeds diurnally (Terres 1980).

**Seasonal Movements/Migration:** Local migrator, dispersing widely from breeding colonies after nesting (Gill and Mewaldt 1979). Much of the breeding population from northwestern and northeastern California probably moves southward and is absent from those areas in midwinter.

**Home Range:** In North Carolina, foraged up to 8 km (5 mi) from nesting area (Custer and Osborn 1978).

**Territory:** Breeding territory, used for courtship, copulation, and nesting, is large initially, but shrinks after pair-formation to a "few feet around nest" (Palmer 1962). Sometimes defends roosting and feeding territories (Palmer 1962).

**Reproduction:** Breeds mainly February to July, but April to August in northeastern California (Cogswell 1977). Monogamous, colonial nester. Clutch size is 3-4, sometimes 5. Mean clutch size for 684 nests in a South San Francisco Bay colony (Bair Island) in May 1971, was 2.9 eggs (Gill 1977). Incubation reportedly 24-26 days. Semi-altricial, downy young are tended by both parents. They fly first at 6 wk, but are not independent until some time later. A few breed at 1 yr, but most not until 2-3 yr (Palmer 1962, Harrison 1978).

**Niche:** Human disturbance of nesting colonies in Quebec (simulating a typical scientific nesting study) resulted in nest abandonment, predation of eggs, and reduced late-season nesting (Tremblay and Ellison 1979). Corvidae and other predators eat eggs. Numbers have been reduced from drainage of marshes and swamps, and cutting of trees, but this species is more adaptable and persistent than most other ardeids.

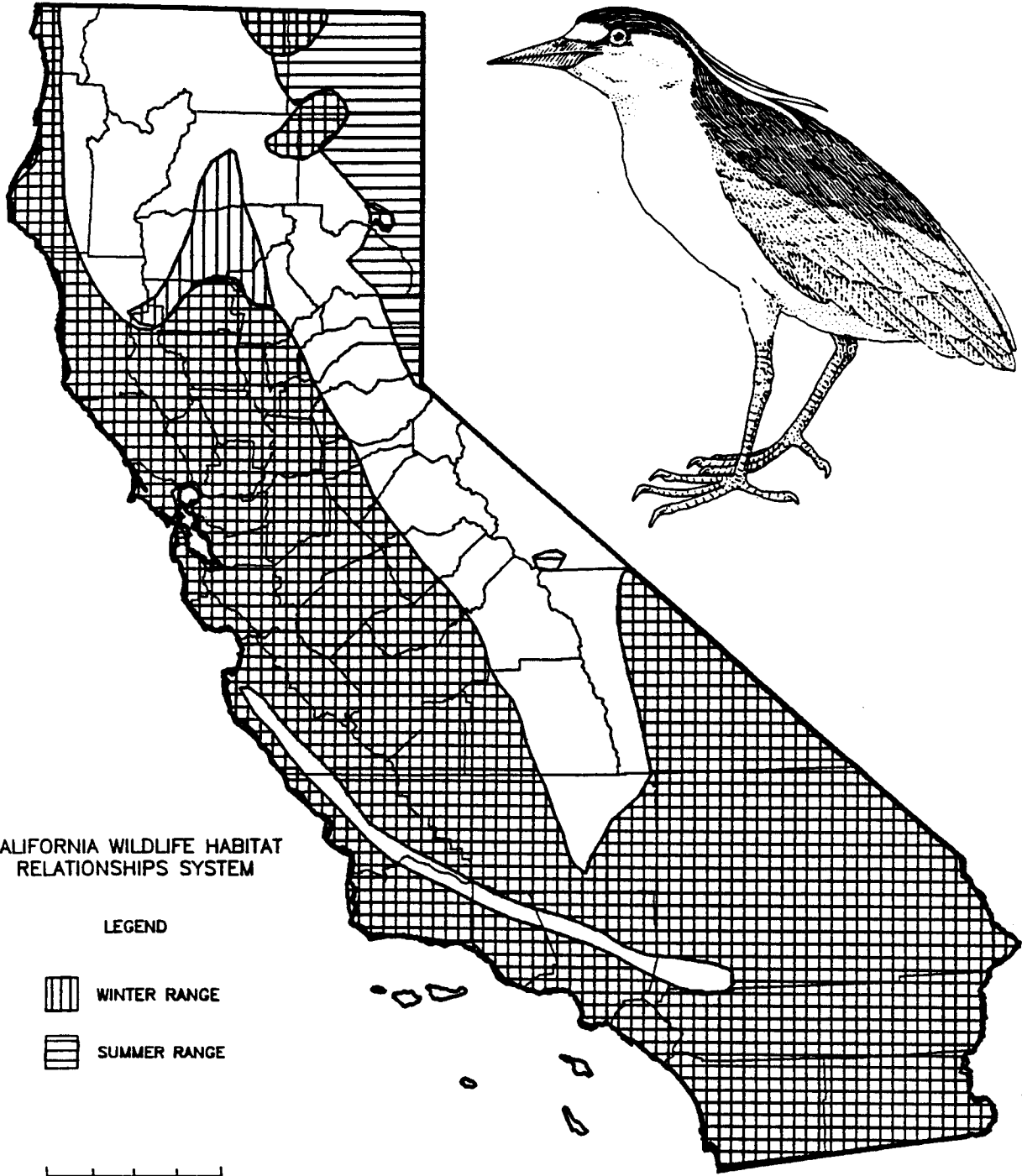
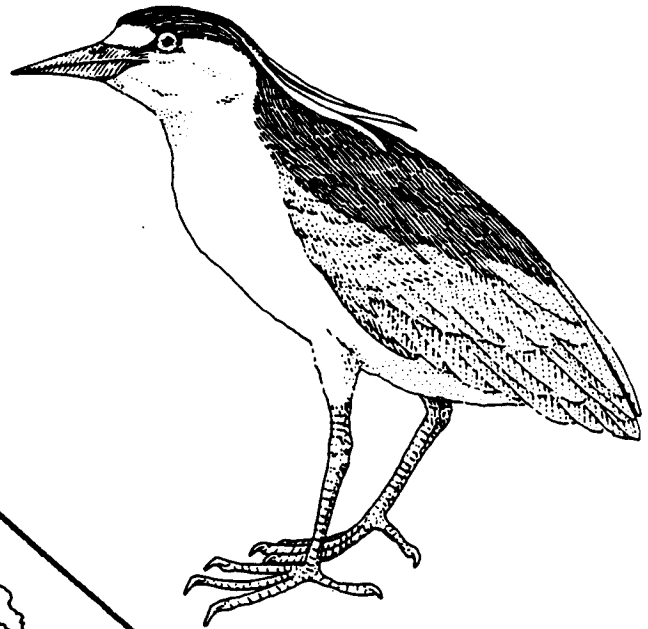
## REFERENCES

Allen and Mangels 1940, Grinnell and Miller 1944, Palmer 1962, Collins 1970, Wolford and Boag 1971a, 1971b, Ives 1972, Hunter and Morris 1976, Kushlan 1976a, Cogswell 1977, Gill 1977, Custer and Osborn 1978, Harrison 1978, Gill and Mewaldt 1979, McCaskie *et al.* 1979, Tremblay and Ellison 1979, Terres 1980, Garrett and Dunn 1981.

# BLACK-CROWNED NIGHT-HERON

## AUTHORSHIP

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Species Note Reviewed By: D. G. Raveling, L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

# B058 Green-backed Heron *Butorides striatus*

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The green-backed heron is an uncommon, yearlong resident in foothills and lowlands throughout most of California. Primarily, it nests and roosts in valley foothill and desert riparian habitats, and feeds in fresh emergent wetland, lacustrine, and slow-moving riverine habitats. Not found regularly east of the Cascades and Sierra Nevada, or on Channel Islands. Found rarely in fresh emergent wetland bordering estuarine habitats, in spring and fall (Cogswell 1977). In winter, sometimes found along estuarine waters away from trees and emergent wetland (Garrett and Dunn 1981). Fairly common April to October in the northern coastal ranges, August to March in the southern coastal ranges, in summer along the Colorado River, and all year at the Salton Sea.

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Eats mostly fish, crustaceans, insects, miscellaneous invertebrates, and rarely small mammals. Forages in shallow water of aquatic habitats or edges of fresh emergent habitats, usually along wooded shores. Often waits motionlessly, but sometimes stalks slowly (Kushlan 1976a). Sometimes dives from the shore or a branch, or stirs bottom with feet to flush prey. Rarely uses bait to lure prey (Lovell 1958, Sisson 1974), or catches flying insects while standing (Warburton 1948).

**Cover:** Roosts and rests in trees near water.

**Reproduction:** In California, nests are built of sticks among the outer or upper branches of trees, and rarely on the ground (Cogswell 1977); most often in willows (Grinnell and Miller 1944). Occasionally nests in conifers or in orchards. Usually nests near water, but sometimes far from water (Palmer 1962). Nests on ground in emergent wetlands have been reported.

**Water:** No additional data found.

**Pattern:** Prefers to nest and roost in trees near good aquatic and wetland foraging habitat.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity. Feeds primarily in early morning and late afternoon (Terres 1980).

**Seasonal Movements/Migration:** Apparently a local migrator; at least part of population shifts southward August to March, especially in northwest. Disperses widely during migration, especially April to May and August to September (Grinnell and Miller 1944).

**Home Range:** No information found.

**Territory:** Breeding territory used for courtship, copulation, and nesting. One territory in New England, about 0.07 ha (0.2 ac) during pair formation, contracted later to the immediate vicinity of the nest (Meyerriechs 1960). Feeding territory defended vigorously in some areas, but not in others (Palmer 1962).

**Reproduction:** In California, breeds late March to July (Cogswell 1977). Monogamous, usually solitary nester, but sometimes nests in small groups. Clutch size usually 4-5, sometimes 3-6. Often single-brooded, sometimes double-brooded, and incubates for 19-21 days. Semi-altricial, downy young are tended by both parents (Harrison 1978). They fly at 21-23 days, and are independent at about 30-35 days. Some individuals begin breeding at 1 yr (Palmer 1962).

**Niche:** Population has declined greatly in California from removal, fragmentation, and disturbance of riparian woodlands. Egg predators include crows.

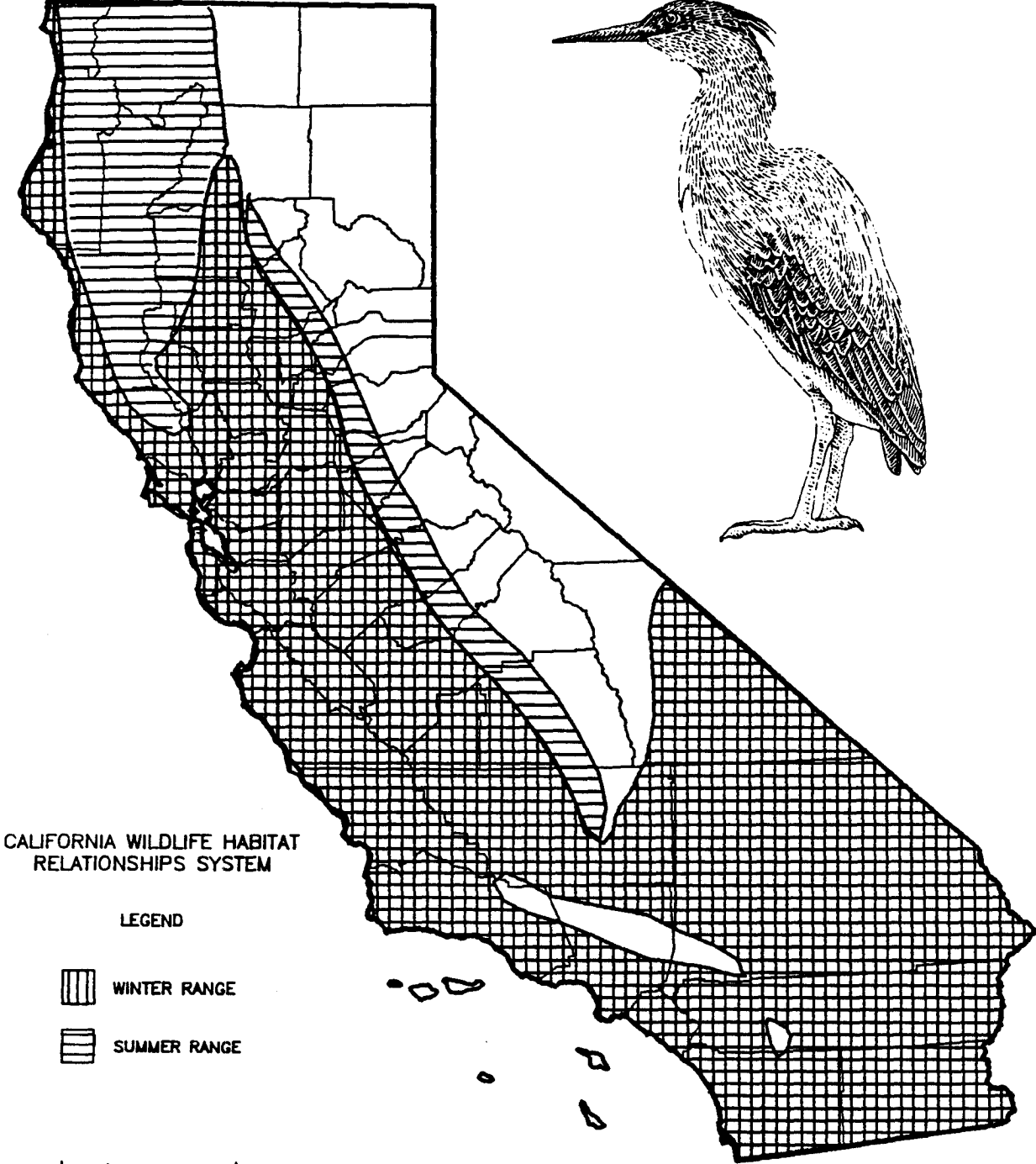
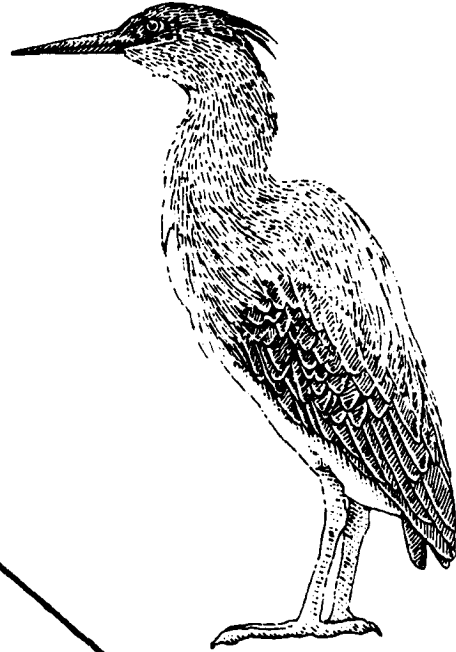
## REFERENCES

Grinnell and Miller 1944, Warburton 1948, Lovell 1958, Meyerriechs 1960, Palmer 1962, Dickerman and Gavino 1969, Sisson 1974, Kushlan 1976a, Cogswell 1977, Harrison 1978, Terres 1980, Garrett and Dunn 1981.

# GREEN-BACKED HERON

## AUTHORSHIP

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Species Note Reviewed By: D. G. Raveling



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles



# B053 Snowy Egret *Egretta thula*

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The snowy egret is widespread in California along shores of coastal estuaries, fresh and saline emergent wetlands, ponds, slow-moving rivers, irrigation ditches, and wet fields. In southern California, common yearlong in the Imperial Valley and along the Colorado River; common September to April in coastal lowlands, but rare through summer, and occurs then mainly in San Diego Co. In desert regions, uncommon in spring migration and rare through summer (Garrett and Dunn 1981). In northern California, common March to November in coastal lowlands. Locally common in the Central Valley all year; rare May to October on northeastern plateau and east of Sierra Nevada (Cogswell 1977, McCaskie *et al.* 1979). There are recent nesting colonies near Redwood City, San Rafael, Pittsburg, Los Baños, Bishop, and the south end of the Salton Sea (Cogswell 1977); and locally in Santa Barbara and San Diego cos., near the Salton Sea and Colorado River (Garrett and Dunn 1981), and on the northeastern plateau (Airola 1980).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Prefers small fish, crustaceans and large insects (Cogswell 1977), but also eats amphibians, reptiles, worms, snails, and small mammals (Palmer 1962). Feeds in shallow water or along shores of wetlands or aquatic habitats, and is the most active feeder of the California herons. Often dashes through shallow water after prey, but also stalks slowly or stands and waits for prey (Kushlan 1976a). Lures or flushes prey with feet (Meyerriecks 1959) or bill (Kushlan 1973); rarely, hovers just above water and drops on prey at surface (Palmer 1962).

**Cover:** No information found. Presumably roosts in dense, emergent vegetation and in trees near water. Also rests in the habitats where it feeds.

**Reproduction:** In southern California, "dense marshes are required for nesting" (Garrett and Dunn 1981). Also nests in trees, usually rather low (Cogswell 1977). Typically, tree nests are 1.5-3 m (5-10 ft) above ground, but may be up to 9 m (30 ft) (Palmer 1962), and they are built of sticks. San Francisco Bay colonies nested at ground level on *Grindelia humilis* and *Salicornia pacifica*, more commonly on *Baccharis pilularis* 0.5-2.0 m (1-6 ft) above ground (Gill 1977, Gill and Mewaldt 1979); one large colony nested on *Scirpus acutus*.

**Water:** No additional data found.

**Pattern:** Requires either dense emergent wetland or trees within daily commuting range of suitable aquatic or wetland feeding areas.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Many individuals from central California migrate to Mexico for first fall and winter. Thereafter, apparently nonmigratory in much of California, although disperses from nesting colonies after breeding (Gill and Mewaldt 1979). Leaves northeastern plateau November to March. Much of population along central California coast departs December to February. Population on south coast greatly augmented by migrants September to April.

**Home Range:** Sometimes forages up to 20 km (12 mi) from nesting area, but usually less than 2 km (1.2 mi) (Custer and Osborn 1978).

**Territory:** Used for courtship, copulation and nesting; defended against other herons as well as conspecifics (Palmer 1962). Initial territory defended by male is larger than subsequent territory after pair-formation, which is limited to a small area around nest (Palmer 1962, Jenni 1969). Separate feeding territories are defended; size unknown (Palmer 1962).

**Reproduction:** Breeds late March to mid-May in southern and central California (Gill 1977), and late April to late August in northern California. Typically monogamous, although some promiscuity has been noted (Palmer 1962). Colonial nester. Clutch size usually 3-4, range 2-6, and probably single-brooded. Incubation 20-24 days, average 22. Semi-altricial, downy young are tended by both parents, and leave nest at 20-25 days. No information on ages at independence or first breeding.

**Niche:** In California, Christman (1957) saw snowy egrets following and feeding near red-breasted mergansers in shallow water. Palmer (1962) reported feeding on insects frightened by pigs and cattle. At Salton Sea, numbers of nesting individuals have declined, apparently from competition with cattle egrets for nest sites (Garrett and Dunn 1981). Probably similar to the great egret: highly sensitive to human intrusions into nesting colonies, and to pesticides.

## REFERENCES

Christman 1957, Meyerriecks 1959, Palmer 1962, Jenni 1969, Kushlan 1973, 1976a, Cogswell 1977, Gill 1977, Custer and Osborn 1978, Gill and Mewaldt 1979, McCaskie *et al.* 1979, Airola 1980, Garrett and Dunn 1981.

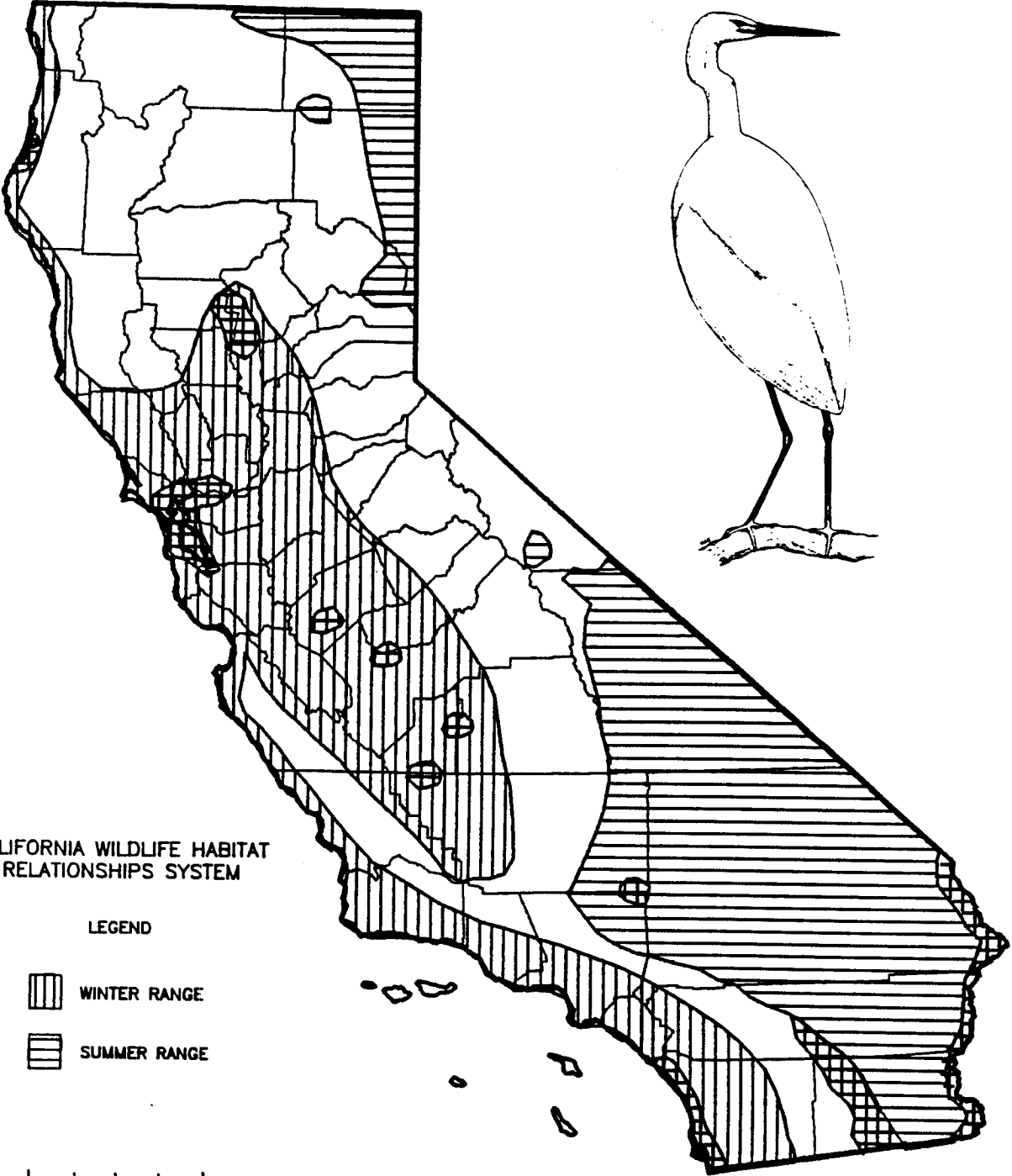
# SNOWY EGRET

## AUTHORSHIP

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Species Note Edited By: R. Duke

Species Note Reviewed By: D. G. Raveling, L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

100 miles

87/87

## B338 Purple Martin *Progne subis*

Family: Hirundinidae Order: Passeriformes Class: Aves

Management Status: California Species of Special Concern Date: June 27, 1983

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### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

An uncommon to rare, local summer resident in a variety of wooded, low-elevation habitats throughout the state; a rare migrant in spring and fall, absent in winter. Uses valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. Also occurs in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood. In the south, now only a rare and local breeder on the coast and in interior mountain ranges, with few breeding localities (Garrett and Dunn 1981). Absent from higher desert regions except as a rare migrant. In the north, an uncommon to rare local breeder on the coast and inland (McCaskie *et al.* 1979). Absent from higher slopes of the Sierra Nevada. Breeding range extends east to Modoc and Lassen cos. (Airola 1980). Inhabits open forests, woodlands, and riparian areas in breeding season. Found in a variety of open habitats during migration, including grassland, wet meadow, and fresh emergent wetland, usually near water.

### SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Hawks insects on long, gliding flights 30-60 m (100-200 ft) above the ground (Airola 1980). Occasionally forages on the ground for ants and other insects (Bent 1942).

**Cover:** Woodlands and low-elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine provide cover. Often nests in tall, old trees near a body of water. Also nests occasionally in residential areas.

**Reproduction:** Nests in old woodpecker cavity mostly, sometimes in human-made structure; in nesting box, under bridge, in culvert. Nest often located in a tall, old, isolated tree or snag in open forest or woodland (Dawson 1923). Not as likely to use nest box in California as in the eastern U.S.

**Water:** Drinks and bathes on the wing (Ehrlich *et al.* 1988).

**Pattern:** Frequents old-growth, multi-layered, open forest and woodland with snags in breeding season. Forages over riparian areas, forest, and woodland. Found in a variety of open habitats in migration.

### SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Arrives from South America in late March. Numbers during migration and through the summer remain small. Departs by late September.

**Home Range:** No data found.

**Territory:** In Montana, nest hole entrance was defended, and male defended female away from nest (Allen and Nice 1952).

**Reproduction:** Nests from April into August, with peak activity in June. Pair nests colonially or singly, depending on nest site availability. Lays 3-8 eggs; average 4-5. May raise 2 broods some years. Altricial young tended by both parents, and leave nest at 24-31 days (Harrison 1978).

**Niche:** Eggs and adults perhaps not often preyed upon.

**Comments:** A California Species of Special Concern (Remsen 1978). Numbers have declined markedly in recent decades because of loss of riparian habitat, removal of snags, and competition for nest cavities from European starlings and house sparrows. Eliminated from much of its previous range in California (Remsen 1978).

### REFERENCES

Dawson 1923, Bent 1942, Allen and Nice 1952, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, Airola 1980, DeSante and Ainley 1980, Garrett and Dunn 1981, Ehrlich *et al.* 1988.

# PURPLE MARTIN

## AUTHORSHIP

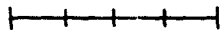
Species Note Prepared By: M. Green  
Species Note Edited By: D. Winkler, R. Duke  
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE

  
100 miles

86/87

## B342 Bank Swallow *Riparia riparia*

Family: Hirundinidae Order: Passeriformes Class: Aves  
Management Status: California Threatened Date: June 27, 1983

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### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A migrant found primarily in riparian and other lowland habitats in California west of the deserts. A spring and fall migrant in the interior, less common on coast; an uncommon and very local summer resident. Casual in southern California in winter; a few winter records along central coast to San Mateo Co. (McCaskie *et al.* 1988). In summer, restricted to riparian areas with vertical cliffs and banks with fine-textured or sandy soil, into which it digs nesting holes. In migration, flocks with other swallows over many open habitats. Range in California estimated to be reduced 50% since 1900 (California Department of Fish and Game 1989). Formerly more common as breeder in California. Now, only a few colonies remain within the state. Perhaps 75% of the current breeding population in California concentrate along banks of Central Valley streams. About 50-60 colonies remain along the upper Sacramento River where it meanders still in a mostly natural state. Other colonies persist along the central coast north to San Francisco Bay, and in the Honey Lake and Lower Klamath Lake areas (Remsen 1978, California Department of Fish and Game 1989).

### SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Forages by hawking insects during long, gliding flights. Feeds predominantly over open riparian areas, but also over brushland, grassland, and cropland.

**Cover:** Uses holes dug in cliffs and river banks for cover.

**Reproduction:** Usually a colonial breeder. Requires fine-textured or sandy banks or cliffs to dig nesting hole. Nest almost always near water, and lined with grasses and other plant material. Burrows are 2.5 to 5.5 cm (1 to 2.2 in) wide and up to 140 cm (54 in) deep. A small chamber at end of burrow contains the nest.

**Water:** No information on drinking needs found; riparian areas used almost exclusively as nesting sites.

**Pattern:** Requires vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, and the ocean for nesting. Feeds primarily over riparian areas during breeding season and over grassland, brushland, and cropland during migration.

### SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Arrives in California from South America in early April and numbers peak in early May. Numbers fall off in summer as migrants pass through, and as the few remaining colonies form. Numbers increase again in fall migration; mostly gone from the state by mid-September. There are few winter records for California.

**Home Range:** Bent (1942) and Grinnell and Miller (1944) indicated that the foraging radius from the nest is not large.

**Territory:** In Wisconsin, Petersen (1955) reported that territory centered at burrow entrances, which were no closer than 15-20 cm (6-8 in) apart. In Michigan and Massachusetts, the nest burrow was defended. Male guarded female from other males, remaining within 1 m (3 ft) of mate during foraging (Beecher and Beecher 1979).

**Reproduction:** Breeds from early May through July, with peak activity from mid-May to mid-June. Pair usually nests colonially; sometimes solitarily or near a few other nests (Hoogland and Sherman 1976). Clutch usually 4-5; range 3-8. Two broods in 1 season have been reported (Stoner 1936). Incubation 12-16 days, by both sexes. Altricial young tended by both adults; leave nest at 18-24 days, breed at 1 yr (Harrison 1978).

**Niche:** Eggs and adults preyed upon by rats, skunks, house cats, snakes, and some raptors. Nest sites sometimes taken by house sparrows (Bent 1942). Smallest swallow in North America.

**Comments:** Channelization and stabilization of banks of nesting rivers, and other destruction and disturbance of nesting areas, are major factors causing the marked decline in numbers in recent decades (California Department of Fish and Game 1989). Designated California Threatened in March 1989.

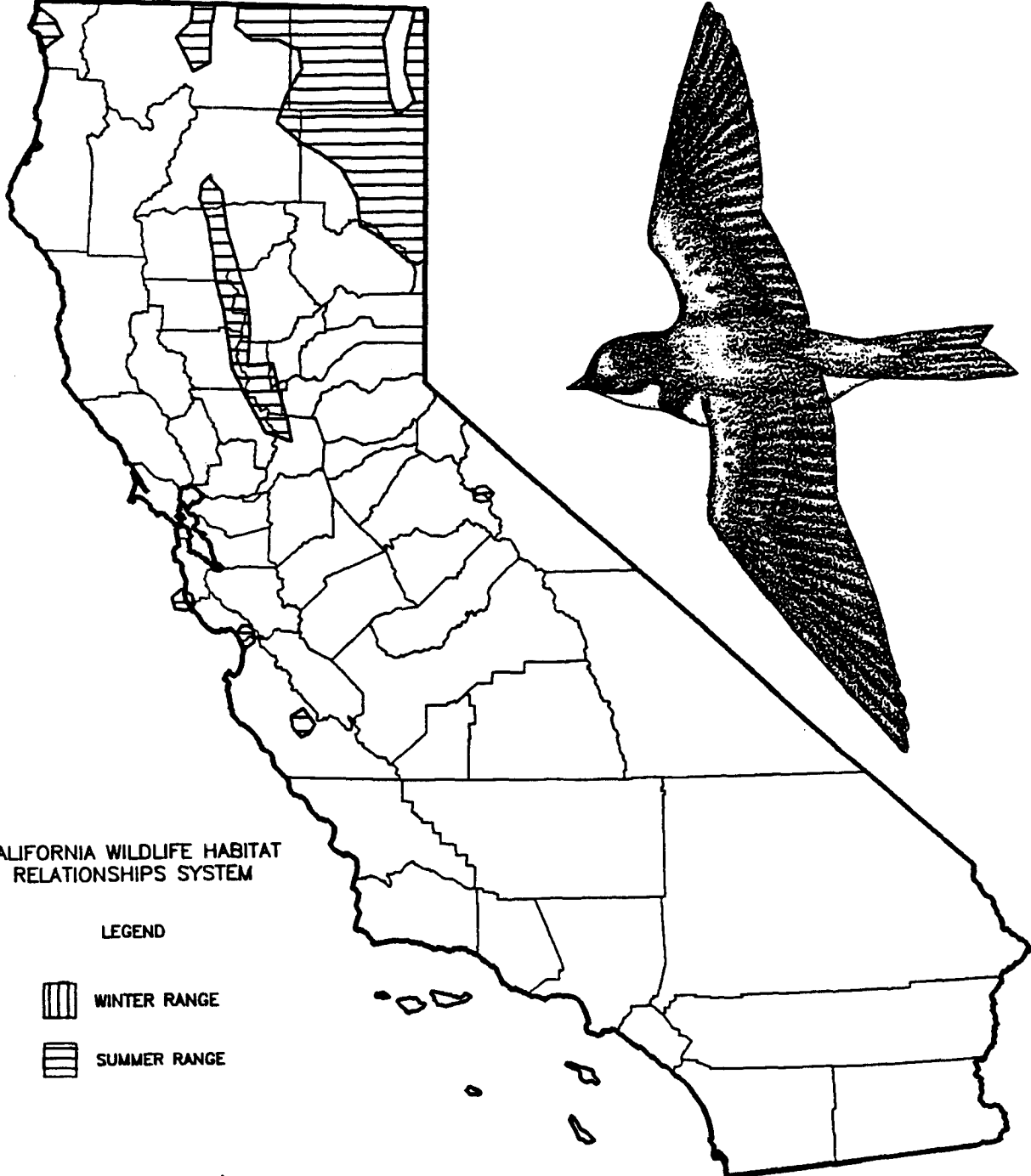
### REFERENCES

Stoner 1936, Bent 1942, Grinnell and Miller 1944, Peterson 1955, Hoogland and Sherman 1976, Harrison 1978, Remsen 1978, Beecher and Beecher 1979, McCaskie *et al.* 1979, 1988, Garrett and Dunn 1981, California Department of Fish and Game 1989.

# BANK SWALLOW

## AUTHORSHIP

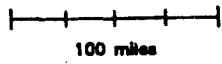
Species Note Prepared By: M. Green  
Species Note Edited By: D. Winkler, R. Duke  
Species Note Reviewed By: L. R. Mewaldt



CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

-  WINTER RANGE
-  SUMMER RANGE



# B215 California Gull *Larus californicus*

Family: Laridae Order: Charadriiformes Class: Aves

Management Status: California Species of Special Concern Date: October 19, 1984

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A fairly common nester at alkali and freshwater lacustrine habitats east of the Sierra Nevada and Cascades, and an abundant visitor to coastal and interior lowlands in nonbreeding season (Grinnell and Miller 1944). In April, begins to depart for breeding grounds. California's nesting population is scattered across the northeastern plateau region and at Mono Lake. Negit Island colony in Mono Lake was estimated at 25,000 pairs in 1976 (Gaines 1977b), but continued survival of this population is threatened by receding water. Evidence of former breeding exists for the Central Valley (Dawson 1923). The first recorded estuarine colony, established on 2 islands in a salt pond on San Francisco Bay, grew from about 30 nests in 1980 to 670 nests in 1983 (Rigney 1983). In late summer, migrates westward across the Sierra Nevada from interior nesting grounds to winter in California and the Pacific Northwest (Cogswell 1977). Preferred habitats along the coast are sandy beaches, mudflats, rocky intertidal, and pelagic areas of marine and estuarine habitats, as well as fresh and saline emergent wetlands. Inland, frequents lacustrine, riverine, and cropland habitats, landfill dumps, and open lawns in cities (Grinnell and Miller 1944). Throughout the winter range in California, often among the most abundant species (McCaskie *et al.* 1979, Garrett and Dunn 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** In winter, this omnivore feeds on garbage, carrion, earthworms, adult insects, and larvae. It frequents landfill dumps, fields, and pastures. On breeding grounds, young fed larval insects, brine shrimp, young birds, garbage, earthworms, and insects (Vermeer 1970).

**Cover:** Adults roost in large concentrations along shorelines, landfills, pastures, and on islands. Young require protective cover from wind and heat.

**Reproduction:** Nests on islands in alkali or freshwater lakes and salt ponds in California (Bent 1921, Johnston and Foster 1954, Lederer 1976, Rigney 1983). Nest is a scrape lined with grasses, feathers, or rubble, on sparsely vegetated portion of isolated island. Nest often located on leeward side of obstructions (Beck 1942).

**Water:** No additional data found.

**Pattern:** Needs undisturbed, isolated islands for nesting. Food supplies must be close to nesting areas.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** After breeding, moves northwest to the coast as far north as British Columbia, west and southwest to the coast of California. In August and September, this is the most common gull at dumps, but later displaced by influx of larger gulls (Cogswell 1977).

**Home Range:** In Montana, breeding home ranges had radii up to 32 km (20 mi) from nesting lakes (Rothweiler 1960).

**Territory:** Territory on breeding grounds centers around the nest. Average inter-nest distances have varied from 1.3 m (4 ft) (Johnston and Foster 1954) to 1.5 m (5 ft) (Vermeer 1970).

**Reproduction:** Nests from mid-April through mid-August, with peak nesting occurring in late May through June. Usually nests in colonies, often in association with other water birds (Harrison 1978). Clutch size 1-3, usually 2 (Harrison 1978). Single-brooded, and both parents incubate. Incubation period 23-27 days. The young are precocial and capable of flight 35-41 days after hatching (Smith and Diem 1972). Begins breeding in 3d yr.

**Niche:** The world's largest colony nested at Mono Lake until 1979 (Winkler 1983). This colony was destroyed when mainland predators crossed to Negit Island on a landbridge that emerged with receding lake waters. Diversion of feeder streams from Mono Lake into the Los Angeles Aqueduct has caused the lake to lose about half its volume since the early 1940s. Although several thousand gulls continue to breed on smaller islands nearby, survival of this population is threatened if water diversions are not curtailed (Gaines 1981).

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

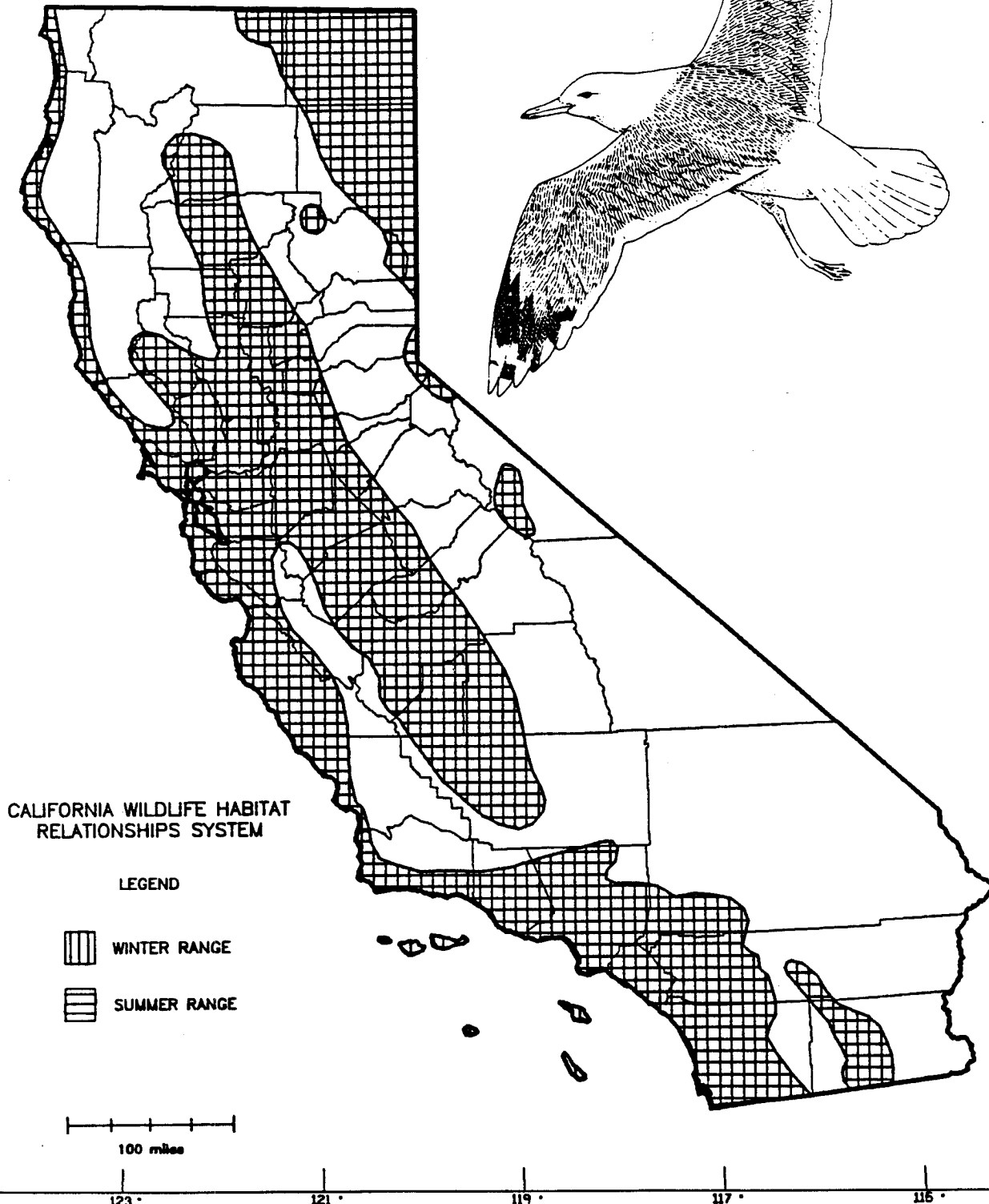
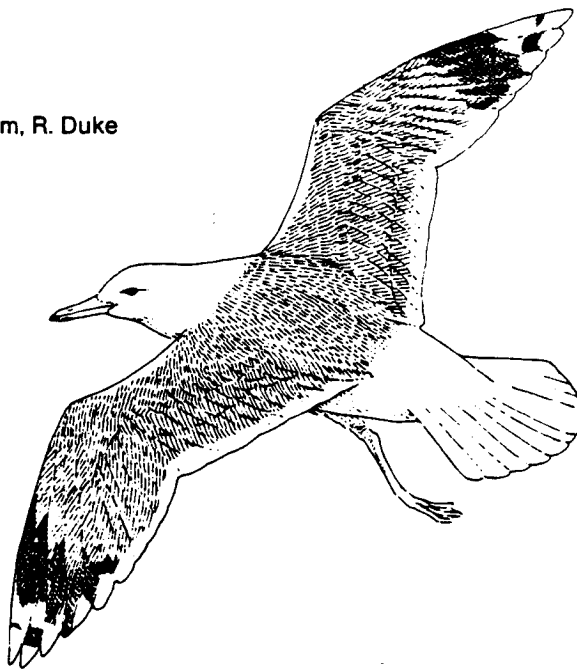
## REFERENCES

Bent 1921, Dawson 1923, Beck 1942, Grinnell and Miller 1944, Johnston and Foster 1954, Rothweiler 1960, Vermeer 1970, Smith and Diem 1972, Lederer 1976, Cogswell 1977, Gaines 1977b, 1981, Harrison 1978, Remsen 1978, McCaskie *et al.* 1979, Garrett and Dunn 1981, Winkler 1983, Rigney 1983.

# CALIFORNIA GULL

## AUTHORSHIP

Species Note Prepared By: M. Rigney  
Species Note Edited By: E. C. Beedy, S. L. Granholm, R. Duke  
Species Note Reviewed By: L. R. Mewaldt




CALIFORNIA WILDLIFE HABITAT  
RELATIONSHIPS SYSTEM

### LEGEND

 WINTER RANGE

 SUMMER RANGE

 100 miles

86/87



# B003 Common Loon *Gavia immer*

Family: Gaviidae Order: Gaviiformes Class: Aves Date: June 28, 1983

Management Status: California Species of Special Concern

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

From September to May, fairly common in estuarine and subtidal marine habitats along entire coast, and uncommon on large, deep lakes in valleys and foothills throughout state. Common migrant along coast, including offshore, in November and May. Recorded rarely on large mountain lakes such as Lake Tahoe in April to May and October to December. A few formerly bred in mountain lakes east of Mt. Lassen in Shasta and Lassen cos., in May to July or later, and still may breed there. In summer, rare along northern California coast (Cogswell 1977, McCaskie *et al.* 1979, Garrett and Dunn 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Diet varies; usually about 80% fish, with crustaceans the next largest item. Aquatic plants, including algae, may constitute up to 20% of diet (Palmer 1962). Most fish eaten are not sought by humans. Other foods taken, mostly on breeding grounds, include snails, leeches, frogs, salamanders, aquatic insects, and occasionally aquatic birds. Dives from water surface, sometimes as deep as 61 m (200 ft), and pursues prey underwater, or takes from bottom; rarely dips for food in shallow water.

**Cover:** Needs at least 18 m (60 ft) of open water for running take-off from water surface (Palmer 1962). Often dives to escape danger, and may remain underwater up to 3 min; deep water provides better cover.

**Reproduction:** For territory, requires deep freshwater lakes, either large or small, with sufficient food fish. Prefers to nest on small islets, but also uses protected sites on shore; usually less than 1.2 m (4 ft) from water and concealed by rocks or vegetation, but sometimes in open (Palmer 1962, Vermeer 1973). Disturbance by humans and motorboats must be minimal (Terres 1980). Same nest site often used year after year. Will use artificial islands as readily as natural ones (McIntyre and Mathisen 1977).

**Water:** No additional data found.

**Pattern:** No additional data found.

## SPECIES LIFE HISTORY

**Activity Patterns:** Yearlong, diurnal activity.

**Seasonal Movements/Migration:** Nearly entire wintering population migrates north to main breeding grounds in northern U.S. and Canada, departing California April to May and arriving again in September to November.

**Home Range:** While breeding, home range is limited to the territory, except for aerial displays and, in some cases, feeding and resting (Palmer 1962).

**Territory:** Territory actively defended, especially after young hatch. Territories in Minnesota were 6-8 ha (15-20 ac) in bays of large lakes (n=42), and up to 40 ha (100 ac) on entire small lakes (n=10) (Olson and Marshall 1952). If several territories occur on one lake, each is separated by points, narrows, etc. Territories in Iceland were up to 25 ha (62 ac) (Sjolander and Agren 1972). In winter, along the Virginia coast, individuals defended foraging territories of 4-8 ha (10-20 ac) during the day, and rafted together at night (McIntyre 1978).

**Reproduction:** Pair bonds often established before arriving on breeding grounds. Arrive in April or May, set up territories and lay eggs mainly May to June (Palmer 1962). Monogamous pairs often nest solitarily. Clutch size 1-3, usually 2, and single-brooded. Incubation averages 29 days. Precocial young are cared for by both parents at least until they can fly, at 12 wk (Palmer 1962). Probably breed first at 2 yr.

**Niche:** Have been observed chasing black ducks and common mergansers out of nesting territory, and wood ducks appear to avoid common loon territories (Palmer 1962). Mortality is caused by hunters in populated areas, and locally by oil spills. Nest failures sometimes caused by human disturbance, especially by motorboats.

**Comments:** The common loon should be looked for in its former breeding range in northeastern California. Any individuals found in suitable nesting habitat in the breeding season should be protected from disturbance, and assisted to again breed in California. A California Species of Special Concern (Remsen 1978).

## REFERENCES

Bent 1919, Olson and Marshall 1952, Palmer 1962, Sjolander and Agren 1972, Vermeer 1973, Cogswell 1977, McIntyre and Mathisen 1977, McIntyre 1978, Remsen 1978, McCaskie *et al.* 1979, Terres 1980, Garrett and Dunn 1981.

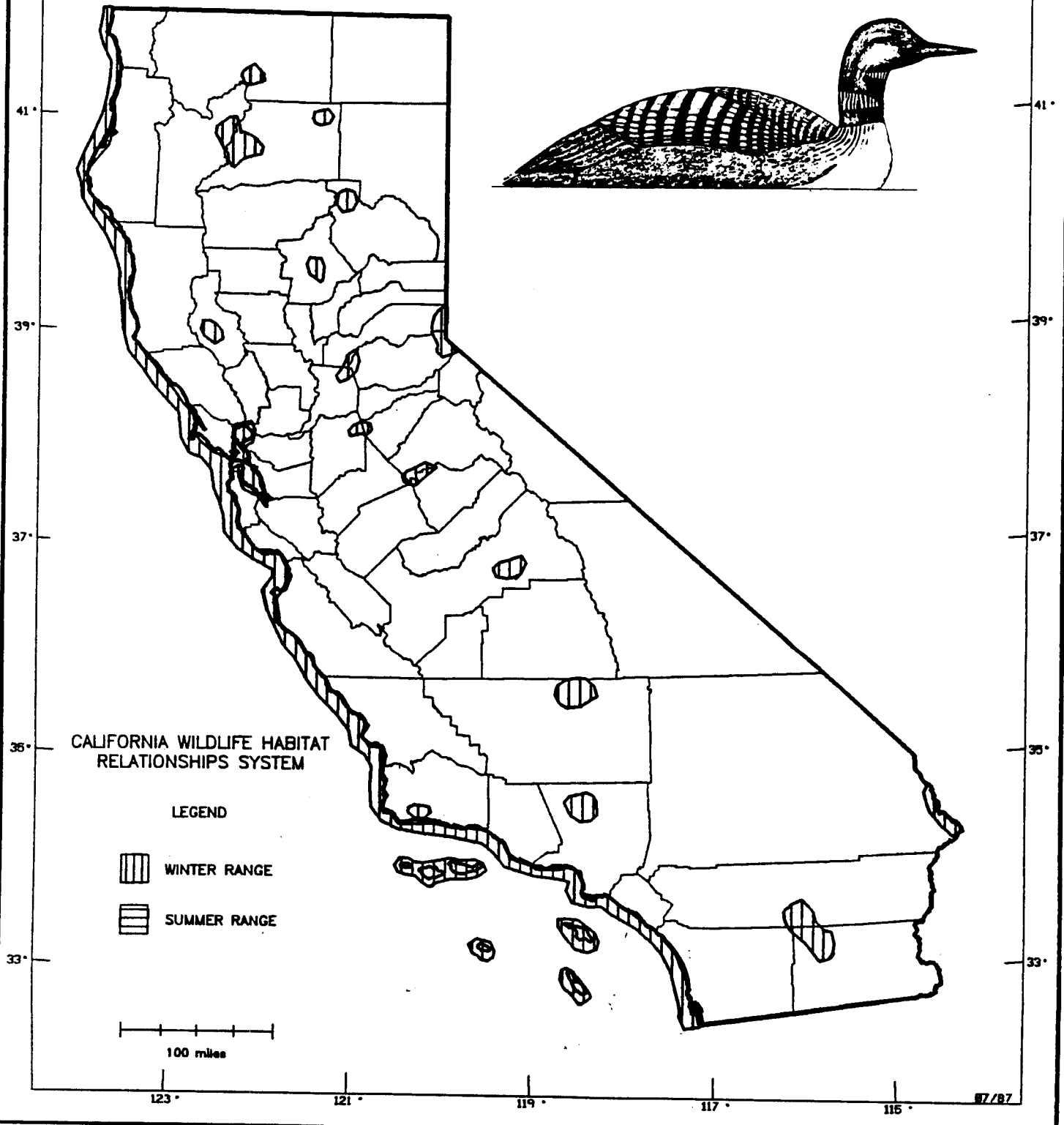
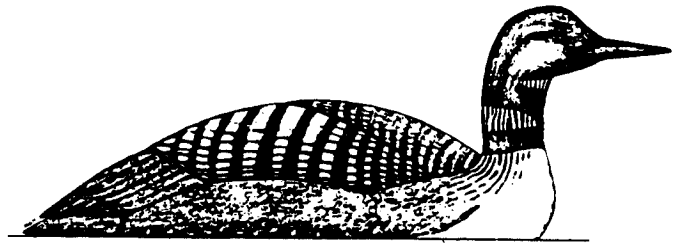
# COMMON LOON

## AUTHORSHIP

Species Note Prepared By: S. L. Granholm

Species Note Edited By: R. Duke

Species Note Reviewed By: D. G. Raveling, D. A. Airola



**B010 Western Grebe** *Aechmophorus occidentalis*  
**Clark's Grebe** *Aechmophorus clarkii*

Family: Podicipedidae Order: Podicipediformes Class: Aves Date: January 10, 1989

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**DISTRIBUTION, ABUNDANCE, AND SEASONALITY**

"Light phase" individuals (black crown does not extend to eyes) recently separated into Clark's grebe species (American Ornithologists' Union 1985). Requirements and life history of these 2 species, which occur together in mixed flocks, very similar; differences not documented except as noted (Ratti 1979, 1981, Ehrlich *et al.* 1988). Common to abundant October to May along entire coast in marine subtidal and estuarine waters. Uncommon to fairly common on large lakes near coast and inland at low elevations, and rare in Great Basin (Cogswell 1977, McCaskie *et al.* 1979). Nest on Modoc Plateau and south locally to Inyo Co. (Airola 1980). Also nest locally elsewhere, including Sacramento National Wildlife Refuge, Lake Havasu, Salton Sea, and Sweetwater Reservoir (San Diego Co.) (Garrett and Dunn 1981). Breed on large, marshy lakes, normally deeper than required by eared grebe. In summer, uncommon along coast, and rare at large inland lakes, except near breeding colonies.

**SPECIFIC HABITAT REQUIREMENTS**

**Feeding:** Obtain all food in water by diving and pursuing; usually in waters at least 1.3 m (4 ft) deep (Lawrence 1950), but often in shallower water in summer. Eat mostly fish, but also insects and other invertebrates, and rarely amphibians and plants. At Clear Lake, Lake Co., 27 stomachs contained 81% fish, 17% insects, and 2% plants; fish were 27-88 mm (1-3.5 in) long; amounts of insects eaten decreased from May to September (Lawrence 1950). As with other grebes, feathers eaten by adults and young, and accumulate in the stomach.

**Cover:** Rest on water, usually well offshore. Often dive to escape danger; longest recorded dive was 63 sec (Palmer 1962).

**Reproduction:** Require large, open waters for courtship, feeding, and flocking, and frequent extensive beds of tall, emergent vegetation such as tules or cattails for nesting. Nest platform built up from water bottom, or floats in water up to 3 m (10 ft) deep, usually near open water. Lindvall and Low (1982) were the first to report nests in open water, with no emergent vegetation. Of 386 nests in Utah, 41% were in shallow, open water, 200-800 m (660-2640 ft) from shore. Others mostly in open, emergent vegetation, but 5% were on immediate shoreline. Nero *et al.* (1958) also reported nests on dry land, up to 23 m (75 ft) from water, where water level had dropped just prior to nest building.

**Water:** No additional data found.

**Pattern:** For nesting, prefer large stands of tall, emergent vegetation adjacent to large lakes.

**SPECIES LIFE HISTORY**

**Activity Patterns:** Yearlong, diurnal activity, except most migration is at night. Commonly feed at night with broods.

**Seasonal Movements/Migration:** Breeders, concentrated mainly in northeastern California, mostly depart by late September and return in March, although a few remain in winter as long as there is open water. Frequent coast and some inland reservoirs (e.g., Lake Berryessa) October to May. It is not known what portions of winter populations breed in California.

**Home Range:** No information found.

**Territory:** Breeding territory includes only immediate vicinity of nest (Palmer 1962). At Eagle Lake, Lassen Co., Gould (1974) found a minimum distance between nests of 1.3 m (4 ft).

**Reproduction:** Courtship mainly April to May, and nests occupied May to August. Monogamous, colonial nesters; sometimes hundreds or even thousands of nests at a lake. Occasionally nest singly (Lindvall and Low 1982). Clutch usually 3-4 eggs, range 1-6, and replacement clutches common. Single-brooded. Incubation about 23 days. Precocial young tended by both parents until 4-5 wk old, and almost full-grown. In Utah, parents cared for young until late September (Lindvall and Low 1982). Age of first breeding not reported.

**Niche:** Destruction of wetlands and introduction of pesticides into watersheds are major causes of a continuing decline of numbers (Feerer and Garrett 1977). Lakeshore development near nesting colonies, and disturbance by boaters and fishermen, also detrimental (Gould 1974, Lederer 1976). Clark's grebe tends to feed farther from shore than western grebe. No other niche separation information found (Ehrlich *et al.* 1988).

**Comments:** Western grebe usually much more common throughout the sympatric range. About 12% of 2373 individuals observed in and near California in January 1977 were Clark's grebes. Goose Lake, Modoc Co., breeding population (more than 90% Clark's grebes) is the largest known concentration of Clark's grebes (Ratti 1981).

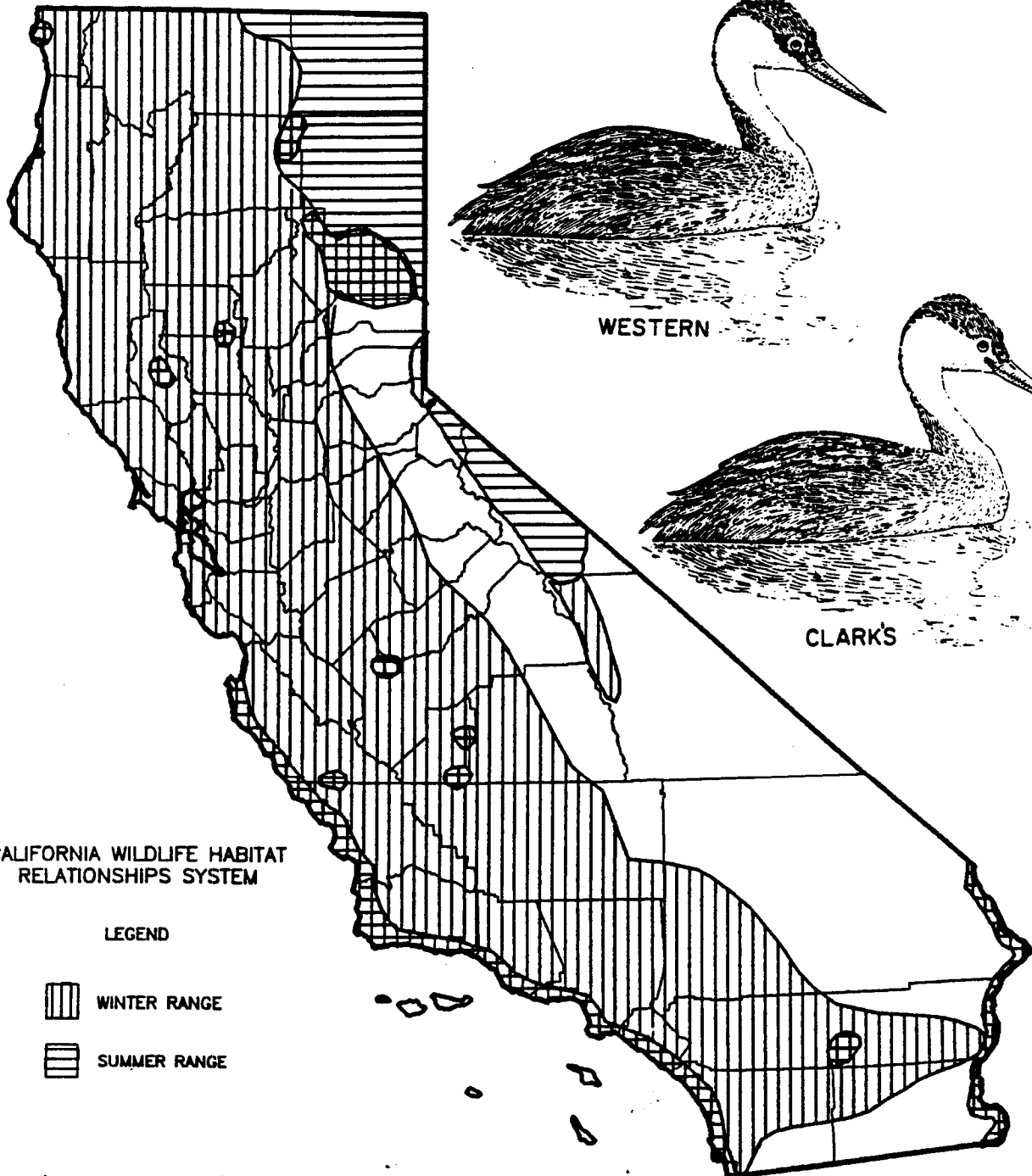
**REFERENCES**

Bent 1919, Munro 1941, Lawrence 1950, Nero *et al.* 1958, Palmer 1962, Gould 1974, Lederer 1976, Cogswell 1977, Feerer and Garrett 1977, McCaskie *et al.* 1979, Ratti 1979, 1981, Airola 1980, Garrett and Dunn 1981, Lindvall and Low 1982, American Ornithologists' Union 1985, Ehrlich *et al.* 1988.

**WESTERN GREBE  
and  
CLARK'S GREBE**

**AUTHORSHIP**

Species Note Prepared By: S. L. Granholm  
Species Note Edited By: R. Duke  
Species Note Reviewed By: D.G. Raveling, W. F. Laudenslayer, Jr.



# B042 American White Pelican *Pelecanus erythrorhynchos*

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

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## DISTRIBUTION, ABUNDANCE, AND SEASONALITY

In California, now nests only at large lakes in Klamath Basin, especially Clear Lake National Wildlife Refuge (Airola 1980, Sloan 1982). It is common to abundant on nesting grounds April to August (sometimes March to September). Bred at Honey Lake in 1976 (Tait *et al.* 1978), and formerly bred in large numbers in Central Valley and Salton Sea (Cogswell 1977). From August to December common on salt ponds of San Francisco Bay, locally uncommon to common on large lakes and estuaries in Central Valley and on the coastal slope from Sonoma Co. south. Fairly common at Lake Tahoe and Salton Sea in late spring and summer. Common spring and fall migrant at Salton Sea and Colorado River. In fall and winter, rare at Salton Sea, Morro Bay, and San Diego Bay; sporadic elsewhere. Migrant flocks pass overhead almost any month, but mainly in spring and fall throughout the state, especially in southern California (Cogswell 1977, McCaskie *et al.* 1979, Garrett and Dunn 1981).

## SPECIFIC HABITAT REQUIREMENTS

**Feeding:** Feeds in water of various depths, diving for prey items from the surface and scooping them up in pouch. In shallow water, small groups sometimes cooperate to drive fish closer to shore, where they are easily caught. Preys almost entirely on fish, but occasionally on amphibians and crustaceans (Palmer 1962); in a breeding colony in North Dakota over half of diet consisted of larval tiger salamanders (Lingle and Sloan 1980).

**Cover:** Rests in day and roosts at night along edge of water, on beaches, sandbars, or old driftwood, but never in trees.

**Reproduction:** Nests at large freshwater and salt-water lakes, usually on small islands or remote dikes. Nest-site must be flat or gently sloping, lacking shrubs or other obstructions that would impede taking flight, free of human disturbance, and usually with loose earth suitable for nest-mounds. One report of nesting on floating tule islands (Palmer 1962).

**Water:** No additional data found.

**Pattern:** During breeding season, may commute as much as 306 km (184 mi) each way from breeding grounds to foraging area (Lingle and Sloan 1980); thus does not require nest site and food at same lake.

## SPECIES LIFE HISTORY

**Activity Patterns:** Active yearlong. Circadian feeder during breeding season, though less active in middle

of day. Diurnal feeder in winter. In tidal areas, usually feeds on rising tide (Palmer 1962).

**Seasonal Movements/Migration:** Most of breeding population leaves northeastern California from October to March. Migrant flocks are seen throughout much of California. Large numbers move into San Francisco Bay from July to December; fewer elsewhere in central and southern California. Small numbers winter locally, mainly in southern California.

**Home Range:** Breeders foraged as far as 81-145 km (50-90 mi) from the nest in Utah (Low *et al.* 1950); 95 km (60 mi) at Pyramid Lake, Nevada (Marshall and Giles 1953); and 48-306 km (29-184 mi) in North Dakota (Lingle and Sloan 1980).

**Territory:** Territory defended only as far as adults can reach from the nest (Palmer 1962). Mean distance between nests was 107 cm (42 in), and the minimum was 74 cm (29 in) in Wyoming (Schaller 1964). The mean distance was 59 cm (23 in), and the minimum was 25 cm (10 in), in Utah (Knopf 1979).

**Reproduction:** A monogamous, colonial nester, in groups of a few to several hundred pairs. Courtship begins soon after arrival at breeding grounds (Knopf 1979), thus in March or April in California. Nest-building begins in March or April, egg-laying in April (Cogswell 1977). Clutch size is usually 2 eggs, sometimes 1, with up to 6 reported. Presumably, single-brooded. Incubation probably lasts about 36 days, as in other pelicans (Harrison 1978). Altricial young are fed by both parents, and leave the nest at 3-4 wk. Age at first flight about 2 mo, but young may be independent before that; by September in most cases.

**Niche:** Mortality results mostly from human disturbance, "colony interactions" and bad weather (Sloan 1982); frightening adults from nests can cause desertion or overheating of young. The major natural enemies are gulls, which steal eggs, but only in small numbers. Coyotes can eliminate colonies if islands become connected to shore. Susceptible to pollution of watershed by persistent pesticides. Degradation of breeding habitat has eliminated several major colonies in California.

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

## REFERENCES

Low *et al.* 1950, Marshall and Giles 1953, Palmer 1962, Schaller 1964, Cogswell 1977, Harrison 1978, Remsen 1978, Tait *et al.* 1978, Knopf 1979, McCaskie *et al.* 1979, Airola 1980, Lingle and Sloan 1980, Garrett and Dunn 1981, Sloan 1982.