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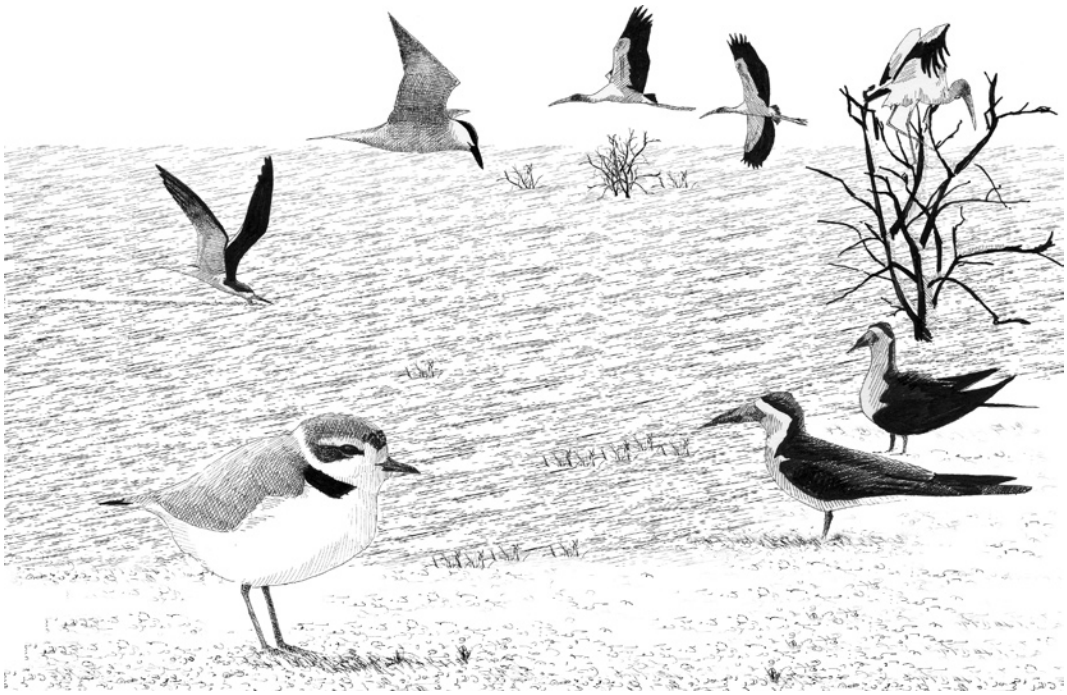
Species Accounts



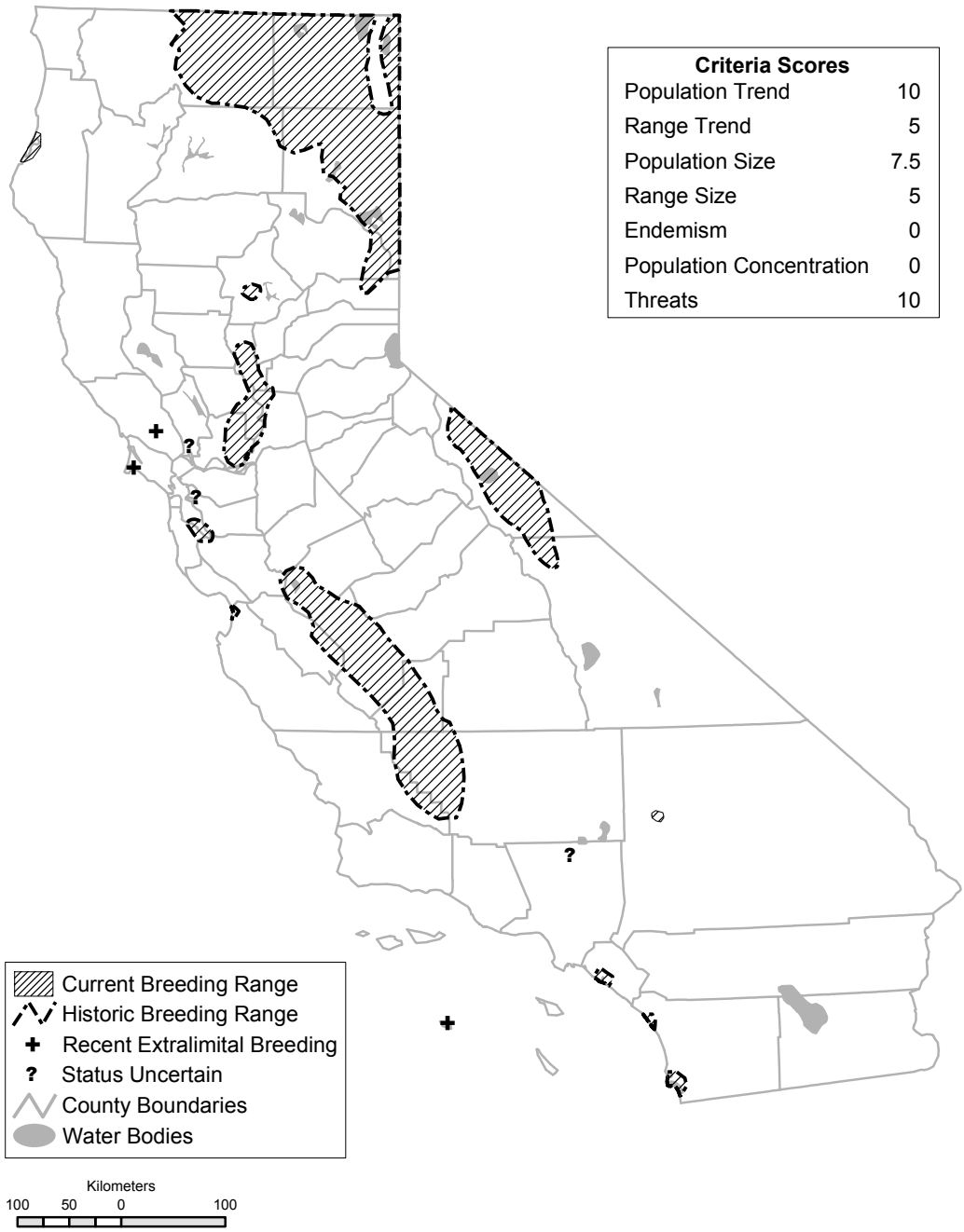
Andy Birch

PDF of Short-eared Owl account from:

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

SHORT-EARED OWL (*Asio flammeus*)

Don Roberson



Current and historic (ca. 1944) breeding range of the Short-eared Owl in California. Breeding is most regular in northeastern California and in Suisun Marsh, and mainly irregular or extralimital elsewhere, particularly on the immediate southern coast. Breeding numbers have declined at least moderately, but sparse historical information on the species' distributional limits, and cyclic or episodic breeding in many areas, make it difficult to assess changes in the overall breeding range. Although fluctuating greatly annually, numbers are generally greatest during migration and winter, when birds occur more widely in lowland areas of the state.

Special Concern Priority

Currently considered a Bird Species of Special Concern (breeding), priority 3. Included on both prior special concern lists (Remsen 1978, 2nd priority; CDFG 1992).

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment (Sauer et al. 2005).

General Range and Abundance

Breeds over much of northern North America; additional populations occur in Eurasia and South America and on many oceanic islands (Holt and Leasure 1993). Many northern populations are migratory; North American breeders winter south to northern Mexico and Florida. Numbers fluctuate dramatically in response to periodic "bust or boom" cycles of the owls' primary prey; the breeding range dramatically expands and contracts following these prey cycles, making it difficult to give any general geographic statement about range or abundance. North American owls are attributed to *A. f. flammeus*; other named subspecies are from oceanic islands.

Seasonal Status in California

Year-round resident in certain areas within California; the breeding season stretches from March through July (Dixon 1934, Gill 1977, Collins and Jones in press). Influxes of birds from the north, which increase the number of owls within the state tenfold or more during some winters, are highly variable but generally occur between late October and early March (Fisler 1960, Garrett and Dunn 1981).

Historic Range and Abundance in California

Grinnell and Miller (1944) described Short-eared Owls as breeding interruptedly the entire length of the state west of the southern deserts "in very small numbers." They knew of nesting at Lava Beds National Monument, Siskiyou County; June Lake and McGee Creek, Mono County; Redwood City, San Mateo County; New Hope, Fresno County; Newport, Orange County; and National City, San Diego County. Additional historical nest records are from Wasco, Kern County (WFVZ egg set data), and Laws, Inyo County (J. Dixon field notes, MVZ). Also notable for the south coast is a 2 July 1920 record for the "Estero" in Santa Barbara, Santa Barbara County (Lehman 1994), and observations by J. B. Dixon (in Willet 1933) of birds at San Diego Bay and at Santa Margarita, San Diego County, "during summer months." By contrast, Grinnell and Miller (1944) described winter visitants as "common and widely distributed." They considered the species formerly "abundant in winter," and attributed a notable reduction in "late years" to shooting by duck hunters.

Recent Range and Abundance in California

The cyclical nature of range expansion and retraction can make it difficult to distinguish between areas of regular versus irregular breeding. While small resident populations of Short-eared Owls remain in the Great Basin region and locally in the Sacramento–San Joaquin River Delta (see map), most recent breeding from coastal central California and the San Joaquin Valley has been episodic. Breeding in mainland southern California is now exceptional and limited to years of unusual incursions. Recent incursions occurred from 1983 through 1984 and from 1987 to 1992 after El Niño winter rains produced bumper crops of herbaceous cover that coincided with peak cycles of vole productivity. The breeding range of the Short-eared Owl retracts dramatically in drought conditions and during prey reductions.

Both the large fluctuations in owl numbers and the nature of the fragmentary and anecdotal data make it very difficult to compile any reasonable population estimates for this cyclical species. In poor years with few microtine prey and when marsh habitat is reduced by drought, very few breeding owls are left in resident areas, and numbers likely total fewer than 50 pairs statewide. In wet years that bring substantial cover and coincide with peaks of prey cycles, local nest density may exceed 7 nests per 40 hectares of appropriate habitat (Larsen 1987), and the statewide owl population may exceed 500 pairs.

Below, key information is described by subregions of the state for nesting and for the state as a whole for winter.

Northeastern California. This region, including mainly the Klamath Basin, Modoc Plateau, and Great Basin of California, contains the largest populations of nesting Short-eared Owls. In Siskiyou, Modoc, and Lassen counties, Short-eared Owls breed at major refuges such as Lower Klamath NWR, Tule Lake NWR, Modoc NWR,

Honey Lake WA, and Ash Creek WA, but no reliable population estimates have been made (Larsen 1987, R. Ekstrom, F. Hall, T. Rickman, J. Sterling in litt.). In good years, dozens of pairs likely nest at Lower Klamath NWR, Modoc NWR, and Honey Lake WA (P. Bloom, W. D. Shuford in litt.). Spring road kills found in the Surprise Valley, Modoc County, suggest nesting there. In some years, Short-eared Owls nest in Fall River Valley, Shasta County (B. Yutzy in litt.), and Sierra Valley, Sierra County (MPCR files, W. D. Shuford in litt.). Birds suspected of nesting in Mono County were pairs in Bridgeport Valley in May 1984 (Gaines 1992) and along the east shore of Mono Lake in June 1996 (T. Beedy in litt.), and an adult at Fish Slough on 4 June 2006 (W. D. Shuford in litt.). A 20 June 1978 record from about 10 mi southeast of Bishop near the Warm Springs Rd. (T. Heindel in litt.) suggests occasional nesting south to Inyo County.

Sacramento Valley and Sierra foothills. In some years, these owls nest at Table Mountain in western Butte County (T. Beedy in litt.). Pairs occasionally nest in the Sacramento Valley in irregularly grazed wetlands west of the Sutter Buttes, Sutter County (R. Hasey in litt.), although none are known to breed in the federal and state wildlife refuges in the Sacramento Valley (B. E. Deuel in litt.) despite a few summer records there (MPCR files). One nest was found southwest of Lincoln, Placer County, in 1998 (J. Ranlett, B. Williams in litt.). There is a record of nesting near Davis in 1976 (Remsen 1978) and recent possible breeding nearby at the Yolo Bypass wetlands, Yolo County (S. Hampton in litt.).

Suisun Marsh and Sacramento–San Joaquin River Delta. Grizzly Island WA, Solano County, in Suisun Marsh supports the only resident population of owls in this region. In the spring 1987, 39 nests and 100 fledglings were documented (Larsen 1987), apparently in response to upland management that led to major increases in microtine prey. By contrast, observers found only 3–6 owls on surveys there the previous two years. Management to provide habitat and prey annually has resulted in a few resident owls at Grizzly Island ever since, and larger numbers some years (C. Fien in litt.). There was also a nest from west Pittsburg, Contra Costa County, in May 1979 (MPCR files).

In the Sacramento–San Joaquin River Delta, there are nest records from the Cosumnes River Preserve, Sacramento County, in the late 1990s (J. Buck fide J. Trochet in litt.) and a summer observation suggesting nesting at Byron, Contra Costa County, in 1980 and 2002 (S. Glover in litt.).

San Joaquin Valley and adjacent Coast Range valleys. Nesting by Short-eared Owls in this region is generally episodic, particularly after wet winters. A nesting pair was observed on Santa Fe Grade, Merced County, sometime in the 1980s (D. Shearwater in litt.). Following the El Niño rains of 1998, a vole population explosion in the Panoche Hills of Fresno County was apparently responsible for several Short-eared Owl broods where none are usually found (S. Fitton in litt.). About a dozen owls have been resident near Mendota WA, Fresno County, since 2000, with three nests found in 2002, and individuals were resident at another restoration site, near Alpaugh, Tulare County (K. Kreitinger in litt.). The species may also nest regularly in alfalfa and grain fields in the Tulare Basin of the southern San Joaquin Valley (R. Hansen in litt.). Ten nests were in alfalfa fields during the summer of 1983 near Wasco, Kern County (R. Hansen in litt., MPCR files). On the Carrizo Plain, San Luis Obispo County, rodent numbers rebounded following rains in March 1991, and by the spring of 1992 nesting Short-eared Owls were observed there (S. Fitton in litt.). A Breeding Bird Survey route in the Carrizo Plain recorded 17 and 15 birds in 1992 and 1993, respectively, but none in any other year from 1981 to 2001 (Sauer et al. 2005).

Coastal California. Following the winter of 1989–90, when up to 24 owls remained into April in ungrazed pastures with high rodent populations, at least one owl pair was feeding young in early June 1990 near what is now the Mad River Slough WA in the Arcata bottoms, Humboldt County (Harris 2005, Hunter et al. 2005). The compilers of the Humboldt County breeding bird atlas project, 1995–1999, found it difficult to distinguish between wintering birds, migrants, and prospective summering birds in early spring (Hunter et al. 2005). Their records of possible breeding included sightings at Mad River Slough WA of three owls, 7–19 April 1998; two, 13 April 1999; and one, 14 July 1999 (one post-atlas, 9 Apr 2005, D. Fix in litt.), and at Fay Slough WA of one owl, 19 April 1998, and three, 23 March 1999. Strongly suggestive of breeding were records of one to six birds at Humboldt Bay NWR from 27 March to 18 April 2001, including a pair performing courtship displays at the Salmon Creek Unit on 14 April (D. Fix in litt.). To the south, an observation of three fledged young at Point Reyes National Seashore, Marin County, in late June 1979 coincided with a 1978–1979 vole outbreak (Shuford 1993), and a fledged young was picked up injured at Annadel State Park, Sonoma County, that same spring (Burridge 1995).

Breeding was known from the Palo Alto Baylands, Santa Clara County, in 1966 and 1972 (Remsen 1978), and there is a midsummer record from the Napa County marshes in 1970 (MPCR files). Owls nested annually on Bair Island, San Mateo County, from 1971 to 1973 (Gill 1977) and periodically thereafter to 1994 (MPCR files), but apparently not since (P. J. Metropulos in litt.). Predation by non-native Red Foxes (*Vulpes vulpes*) and lowered microtine populations may account for the loss of this population over the past decade (P. J. Metropulos in litt.).

At the Salinas River mouth in Monterey County, which held summer birds as early as 1959, one or two pairs nested most years from 1974 to 1981; breeding behavior was also observed at a site on Elkhorn Slough (Roberson and Tenney 1993). The Salinas-Elkhorn population was apparently extirpated by non-native Red Foxes in the 1980s (Roberson 2002). Predator control programs initiated for the Snowy Plover and other species since 1990 have made the site suitable again, and subsequently there have been a few winter birds most years and one summer record in 1992 (Roberson 2002).

Short-eared Owls apparently breed along the southern California coast only very irregularly, except at Santa Barbara Island in the Channel Islands. Garrett and Dunn (1981) reported a 20 July 1947 record at Huntington Beach, Orange County, as the "most recent summer record for the coast." Following observations of courtship in 1979, these owls were documented breeding on Santa Barbara Island in 1980 to 1983, 1992, 1996, and 2001 (they possibly bred in 1993 and 1994); the hiatus in breeding in 1984 coincided with a decline in the island's mouse population (Collins and Jones in press). Egg dates on Santa Barbara Island from 20 March to 15 April suggest the possibility of breeding by adults seen on San Miguel Island 6–31 May 1999 (Collins and Jones in press) and on the mainland at Seal Beach NWR, Orange County, 16 April 1995 (Hamilton and Willick 1996). In San Diego County, one was observed at the Santa Margarita River mouth 23 May and 12 June 1972. No potential breeders were reported again until sightings at the Tijuana River estuary in 1998, of one 28 May and two 16 June**,** and at the Chula Vista Wildlife Reserve in south San Diego Bay 12 and 19 April 2000 (Unitt 2004).

Mojave Desert. Nesting was suspected in the Antelope Valley, Los Angeles County, in the spring of 1992 (Garrett and Molina 1998). At Harper Dry Lake, San Bernardino County, a recently fledged young was present in mid-June 1978, and three nests, which fledged up to 12 young, were discovered the following spring (BLM nest record cards). More nests were present in May 1980, when one nestling was banded. At the time, nests were in a marsh adjacent to alfalfa fields experiencing a rodent boom (P. Bloom in litt.). Although agricultural fields in this area have been out of production for about the past 10 years (S. Meyers in litt.), one to two of these owls were seen in the Harper Dry Lake area on 30 May 2005 (T. Manolis in litt.).

Winter status. Numbers of wintering Short-eared Owls also vary widely. Annual numbers on all California Christmas Bird Counts combined (www.audubon.org/bird/cbc) in the past 30 years varied from a high of 152 to a low of 32; the highest generally coincided with the best years for breeding. Christmas Counts do not include many of the better habitats for owls in winter, when hundreds may appear in northeastern California (MPCR files), with good numbers (20–30 per site) occasionally as far south as Pixley NWR, Tulare County, and Kern NWR, Kern County (J. Engler, J. Govan pers. comm.), and east to marshes and fields in the desert of San Bernardino County (e.g., up to 150 at Harper Dry Lake in 1987; Garrett and Molina 1998). In such exceptional winters, it is possible that several thousand owls are present statewide; more typically, the number is probably in the hundreds.

Ecological Requirements

Nesting Short-eared Owls require open country that supports concentrations of microtine rodents and herbaceous cover sufficient to conceal their ground nests from predators (Holt and Leasure 1993). Suitable habitats may include salt- and freshwater marshes, irrigated alfalfa or grain fields, and ungrazed grasslands and old pastures. Tule marsh or tall grasslands with cover 30–50 cm in height can support nesting pairs (Holt and Leasure 1993). In restoration areas in the San Joaquin Valley, appropriate habitat may consist of short weedy vegetation with native *Atriplex* or *Allenrolfea* interspersed (K. Kreitinger in litt.).

Short-eared Owls are primarily crepuscular hunters (Holt and Leasure 1993), and often 99% of their diet is small mammals (e.g., Fisler 1960, Clark 1975). In years of high microtine productivity, a cyclical phenomena apparently related to food availability and cover (Krebs 1966, Batzli and Pitelka 1971), Short-eared Owls respond by producing many more young and expanding

their range (Lockie 1955, Clark 1975, Holt and Leasure 1993). In California, the owls are particularly attuned to the three-to-four-year cycle of the California Vole (*Microtus californicus*; Krebs 1966). These voles breed year round, producing 2–6 litters, but numbers reach a peak whenever both food and cover are abundant, most dramatically in ungrazed fields following unusually heavy rains (Krebs 1966, Batzli and Pitelka 1971). Short-eared Owls will resort to other prey when vole numbers ebb (Fisler 1960).

Threats

Historically, the primary threats to Short-eared Owls were shooting, and habitat loss and degradation (Grinnell and Miller 1944, Holt and Leasure 1993, Garrett and Molina 1998). Today, the primary threats are continued habitat loss and degradation, aggravated to an unknown extent by grazing, invasive exotic weeds, water management, and disease.

Productive habitat for resident owls is now almost entirely limited to wildlife refuges and management areas. Management of refuges and restoration areas for herbaceous cover has been successful in maintaining resident owls, even when prey dwindle (Larsen 1987, K. Kreitinger pers. comm.). The availability of appropriate habitat on private land in good years is often random and dependent on crop rotational schemes.

Biologists suspect that grazing cattle causes significant losses each year in northeastern California (P. Bloom, R. Ekstrom, J. Sterling in litt.). Areas that could be prime nesting habitat (e.g., Surprise Valley in Modoc County) have few or no nesting owls because little appropriate wetland or grassland habitat there is left ungrazed (J. Sterling in litt.). Vole populations often increase in California grasslands in response to the reduction or cessation of livestock grazing (Saab et al. 1995, Jones 2000); thus the reduction of grazing benefits not only the owls directly (by reducing loss of eggs and nestlings) but indirectly by increasing their prey.

Water management practices can affect nesting success if grasslands are flooded in spring (especially Apr–May; P. Bloom pers. comm.). Likewise, habitat can be lost if water deliveries are delayed or inadequate and productive grasslands dry up, reducing the vole population. Invasive exotic weeds can reduce the productivity of prime habitats. From the Klamath Basin to Lassen County, for example, incursions of non-native Peppergrass (*Lepidium latifolium*) have degraded numerous hay meadows that have been abandoned by hay farmers, resulting in loss of habitat for Short-eared Owls (F. Hall in litt.).

Losses of eggs and nestlings to ground predators can be a serious local problem, and predation by the non-native Red Fox likely led to the extirpation of nesting owls in the San Francisco Bay area (P. J. Metropolis in litt.) and in coastal Monterey County (Roberson 2002). Other potentially problematic ground predators include domestic dogs and cats, skunks, Raccoons (*Procyon lotor*), and corvids, especially increasing numbers of Common Ravens (*Corvus corax*) along the coast and in the deserts (Roberson 2002, Garrett and Molina 1998). Short-eared Owls are also susceptible to collisions with automobiles where paved roads cross wetland or grassland habitats (Garrett and Molina 1998). In addition, Short-eared Owls are one of four native owls known to have been infected with West Nile virus in the Midwest (Fitzgerald et al. 2003), and may be at particular risk with the spread of this infection in California.

Management and Research Recommendations

- Implement and monitor management practices on wildlife refuges and agricultural lands that are conducive to both vole and Short-eared Owl productivity, taking into account that, because of the cycles of both, obvious benefits may not be realized every year.
- Maintain a mosaic of habitats with lush herbaceous vegetation, including sufficient areas of weedy abandoned fields and wet grasslands; as appropriate, leave some areas ungrazed.
- Implement predator-control programs where necessary, particularly to eliminate non-native ground predators such as the Red Fox.
- Avoid flooding fields or wetlands where owls are known or suspected to be nesting.
- Encourage rotational schemes on cattle-grazed or agricultural fields that leave some land in lush herbaceous vegetation each spring.
- Minimize hay mowing and crop harvesting during the breeding season (particularly Mar–May) in fields that have sufficient cover (30–60 cm high) to support breeding owls, or mow around known nests if they are found.
- Protect coastal salt and interior freshwater marshes and grasslands.

- Educate the public on the cyclical nature of these owls and their prey and on the owls' value in the ecosystem.
- Vigorously enforce hunting requirements on refuges to reduce nontarget losses by hunting.
- Consider losses to owls from vehicle collisions in planning for roads across grasslands, marshes, and agricultural lands that have current or historic owl use.
- Study the relationships between management practices and owl breeding success, taking into account the cycles of both predator and prey.

Monitoring Needs

No current monitoring efforts (e.g., Breeding Bird Survey) are adequate to monitor annual or long-term population changes in breeding Short-eared Owls. Standardized surveys in California, sampling areas of both regular and irregular breeding, should be implemented. Ideally, surveys should be conducted at dusk and early in the breeding season (Mar-Apr), when owls make aerial courtship flights (Holt and Leasure 1993). All monitoring should consider the cyclical nature of the population and avoid drawing conclusions from short-term data.

Acknowledgments

Valuable unpublished information was provided by T. Beedy, P. Bloom, P. Collins, J. N. Davis, B. E. Deuel, R. Ekstrom, J. Engler, C. Fien, S. Fitton, D. Fix, S. Glover, J. Govan, F. Hall, S. Hampton, R. Hansen, R. Hasey, T. Heindel, B. Keener, R. Keiffer, K. Kreitinger, L. LaPre, T. Manolis, M. Matthiessen, G. McCaskie, C. McGaugh, P. J. Metropulos, J. Ranlett, P. Rauch, T. Rickman, D. Shearwater, W. D. Shuford, J. Sterling, J. Trochet, J. White, B. Williams, and B. Yutzy. P. Bloom, K. Garrett, and J. Winter provided helpful comments on an early draft of this account.

Literature Cited

Batzli, G. O., and Pitelka, F. A. 1971. Conditions and diet of cycling populations of the California Vole, *Microtus californicus*. J. Mammal. 52:141–163.

Burridge, B., ed. 1995. Sonoma County Breeding Bird Atlas. Madrone Audubon Soc., Santa Rosa, CA.

California Department of Fish and Game (CDFG). 1992. Bird species of special concern. Unpublished list, July 1992, Calif. Dept. Fish & Game, 1416 Ninth St., Sacramento, CA 95814.

Clark, R. J. 1975. A field study of the Short-eared Owl, *Asio flammeus* (Pontoppidan), in North America. Wildl. Monogr. 47.

Collins, P. W., and Jones, H. L. In press. Birds of California's Channel Islands: Their Status and Distribution. Santa Barbara Mus. Nat. Hist., Santa Barbara, CA.

Dixon, J. B. 1934. Records of the nesting of certain birds in eastern California. Condor 36:35–36.

Fisler, G. F. 1960. Changes in food habits of Short-eared Owls feeding in a salt marsh. Condor 62:286–487.

Fitzgerald, S. D., Patterson, J. S., Kiupel, M., Simmons, H. A., Grimes, S. D., Sarver, C. F., Fulton, R. M., Steficek, B. A., Cooley, T. M., Massey, J. P., and Sikarskie, J. G. 2003. Clinical and pathologic features of West Nile virus infection in native North American owls (Family Strigidae). Avian Disease 47:602–610.

Gaines, D. 1992. Birds of Yosemite and the East Slope, 2nd ed. Artemisia Press, Lee Vining, CA.

Garrett, K., and Dunn, J. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Soc., Los Angeles.

Garrett, K. L., and Molina, K. C. 1998. Short-eared Owl (*Asio flammeus*). Account for the West Mojave Habitat Conservation Plan. Available from the Bureau of Land Mgmt., 22835 Calle San Juan de los Lagos, Moreno Valley, CA 92553 or at www.blm.gov/ca/st/en/fo/cdd/wemo_species_birds.html.

Gill, R. E. 1977. Breeding avifauna of the south San Francisco Bay estuary. W. Birds 8:1–12.

Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Hamilton, R. A., and Willick, D. R. 1996. The Birds of Orange County, California: Status and Distribution. Sea and Sage Press, Sea and Sage Audubon Soc., Irvine, CA.

Harris, S. W. 2005. Northwestern California Birds, 3rd ed. Living Gold Press, Klamath River, CA.

Holt, D. W., and Leasure, S. M. 1993. Short-eared Owl (*Asio flammeus*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 62. Acad. Nat. Sci., Philadelphia.

Hunter, J. E., Fix, D., Schmidt, G. A., and Power, J. C. 2005. Atlas of the Breeding Birds of Humboldt County, California. Redwood Region Audubon Soc., Eureka, CA.

Jones, A. L. 2000. Effects of cattle grazing on North American arid ecosystems: A quantitative review. W. North Am. Nat. 60:155–164.

Krebs, C. J. 1966. Demographic changes in fluctuating populations of *Microtus californicus*. Ecol. Monogr. 36:239–273.

Larsen, C. J. 1987. Short-eared Owl breeding survey. Nongame Bird and Mammal Section Rep., Proj. IW-65-R-4, Job 11-13, Calif. Dept. Fish & Game, Sacramento.

Lehman, P. E. 1994. The Birds of Santa Barbara County, California. Vert. Mus., Univ. Calif., Santa Barbara.

Lockie, J. D. 1955. The breeding habits and food of Short-eared Owls after a vole plague. Bird Study 2:53–67.

Remsen, J. V., Jr. 1978. Bird species of special concern in California: An annotated list of declining or vulnerable bird species. Nongame Wildl. Invest., Wildl. Mgmt. Branch Admin. Rep. 78-1, Calif. Dept. Fish & Game, 1416 Ninth St., Sacramento, CA 95814.

Roberson, D. 2002. Monterey Birds, 2nd ed. Monterey Peninsula Audubon Soc., Carmel, CA.

Roberson, D., and Tenney, C., eds. 1993. Atlas of the Breeding Birds of Monterey County, California. Monterey Peninsula Audubon Soc., Carmel, CA.

Saab, V. A., Bock, C. E., Rich, T. D., and Dobkin, D. S. 1995. Livestock grazing effects in western North America, in Ecology and management of neotropical migratory birds: A synthesis and review of critical issues (T. E. Martin and D. M. Finch, eds.), pp. 311–356. Oxford Univ. Press, New York.

Sauer, J. R., Hines, J. E., and Fallon, J. 2005. The North American Breeding Bird Survey, results and analysis 1966–2004, version 2005.2. USGS Patuxent Wildl. Res. Ctr., Laurel, MD. Available at www.mbr-pwrc.usgs.gov/bbs/bbs.html.

Shuford, W. D. 1993. The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds. California Avifauna Series 1. Bushtit Books, Bolinas, CA.

Unitt, P. 2004. San Diego County bird atlas. Proc. San Diego Soc. Nat. Hist. 39.

Willett, G. 1933. A revised list of the birds of southwestern California. Pac. Coast Avifauna 21.

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