DISTRIBUTION AND ABUNDANCE OF BURROWING OWLS ON THE PENINSULA AND ISLANDS OF BAJA CALIFORNIA

EDUARDO PALACIOS and DANIEL W. ANDERSON, Department of Wildlife, Fish, and Conservation Biology, University of California, Davis, California 95616

ERIC MELLINK and SALVADOR GONZÁLEZ-GUZMÁN, Centro de Investigación Científica y Educación Superior de Ensenada, Ecología, Km 107 Carr. Tijuana–Ensenada, 22860 Ensenada, Baja California, México (U.S. mailing address: P. O. Box 434844, San Diego, California 92143-4844) (current address of Palacios)

ABSTRACT: We compiled 166 historical and recent records of Burrowing Owl sightings and/or specimens from 61 locations throughout the peninsula of Baja California and associated islands. Thirty-eight records are from the delta of the Colorado River, 57 from northwestern Baja California, 3 from the Central Desert, 12 from the Vizcaino Desert, and 12 from the Cape region. These records confirm that the Burrowing Owl is a widespread, albeit perhaps uncommon, resident the length of the peninsula. The larger aggregations have been reported from the central and northern portions of the peninsula, while the species is rather rare in the Cape region. About one half of the records of Burrowing Owls on the peninsula are from spring and summer. Forty-three percent of the records are from agricultural lands, 18% from wetlands, 15% from open desert, and 12% from coastal sage scrub.

In western North America the breeding range of the Burrowing Owl (*Athene cunicularia*) extends from southern interior British Columbia to Baja California, including many coastal islands, as well as Guadalupe Island, and south to central Mexico, including Clarión Island in the Revillagigedo group (Brewster 1902, Hang et al. 1993, Howell and Webb 1995, A.O.U. 1998). Burrowing Owls winter throughout their breeding range, except for the northern portions of the Great Basin and the Great Plains, and south to southern Mexico, Central, and South America (A.O.U. 1998).

The number of Burrowing Owls that breed in Canada and some parts of the U.S.A., including California, is declining (National Wildlife Federation 1989, Carter et al. 1996, James and Espie 1997, De Sante et al. 1997). It has been hypothesized that the major causes of such a decline have been habitat alterations and other human activities such as poisoning and loss of nest sites through the control of squirrels and prairie dogs (White 1994, see also Lincer 1997). In North America the Burrowing Owl has been designated as threatened widely throughout its range (James and Espie 1997). In Mexico the Burrowing Owl is listed as threatened in the 1994 official list of species at risk (NOM-059-ECOL-1994). Despite this designation, actual information on the status of this species in Mexico is scant (see Enriquez-Rocha 1997). If conservation plans for it are to be developed, more information is needed, especially from its wintering range.

Although the general distribution of the Burrowing Owl in the peninsula of Baja California is well known (see Grinnell 1928, and Wilbur 1987), specific habitats occupied and the abundance of owls are not. The Burrowing Owl was first recorded in the peninsula of Baja California by Baird et al. (1874) from the Cape region and by Sharpe (1875) from Magdalena Bay. Its status is poorly known over much of the peninsula, mostly because there has been

little observation effort and some potential habitats adjacent to coastal wetlands on the Pacific coast are not easily accessible. Analysis of its status as a breeding species is further complicated by the influx of migrants from the north, and all of Mexico is known to be an important wintering area (Enríquez-Rocha 1997).

In this paper we present an overview of the abundance and distribution of Burrowing Owls on the peninsula of Baja California and adjacent islands by using the information available in the literature, as well as our own unpublished field notes and those of others.

RESULTS AND DISCUSSION

We compiled 166 historical and recent records of Burrowing Owl sightings and/or specimens from 61 locations throughout the peninsula of Baja California, the islands in the northern and central Gulf of California (i. e., north of Cerralvo), and those on the Pacific coast of Baja California (Appendix 1, Figure 1). Thirty-eight records are from the delta of the Colorado River (including Mexicali Valley and San Felipe Desert), 57 from northwestern Baja California, 3 from the Central Desert, 12 from the Vizcaíno Desert, and 12 from the Cape region (see Roberts 1989 for a description of phytogeographical regions and map). These records confirm that the Burrowing Owl is a widespread, albeit perhaps uncommon, resident the length of the peninsula. The larger aggregations have been reported from the central and northern portions of the peninsula, while the species is rather rare in the Cape region (Appendix 1). About one half of the records of Burrowing Owls on the peninsula are from spring and summer.

Brewster (1902) considered the Burrowing Owl a rare bird in the Cape region, and stated that it "seems to be but little more numerously represented in the central and northern portions of the peninsula." In the Cape region, it was apparently confined to the low country near the coast (Brewster 1902). Grinnell (1928) and Wilbur (1987), 60 years later, also considered the Burrowing Owl a widespread resident, both on the mainland at low altitude and on most of the islands, common in the north and rather rare in the Cape district. More recently, however, Howell and Webb (1995) considered it common to fairly common from sea level to 2000 m above sea level, rather than restricted to the lowlands, without providing supportive records. We did not find any records of a high-altitude occurrence of Burrowing Owls.

As 39 records from 23 islands suggest, this owl occurs on most of the coastal islands from the Pacific coast of Baja California and on Guadalupe Island, but it is only a vagrant on 12 islands in the Gulf of California (Appendix 2). It is a common winter visitor to Tiburón and San Esteban islands (van Rossem 1945). Cody (1983) reported the species from seven Gulf islands of various sizes and characters (both land-bridge and non-land-bridge islands). Numerous records from boats suggest that this species commonly disperses over water, accounting for occurrences on Guadalupe and the non-land-bridge islands of the Gulf of California (P. Unitt pers. comm.). The only probable nesting record on an island in the Gulf of California is of an individual at a burrow with abundant pellets and feces at

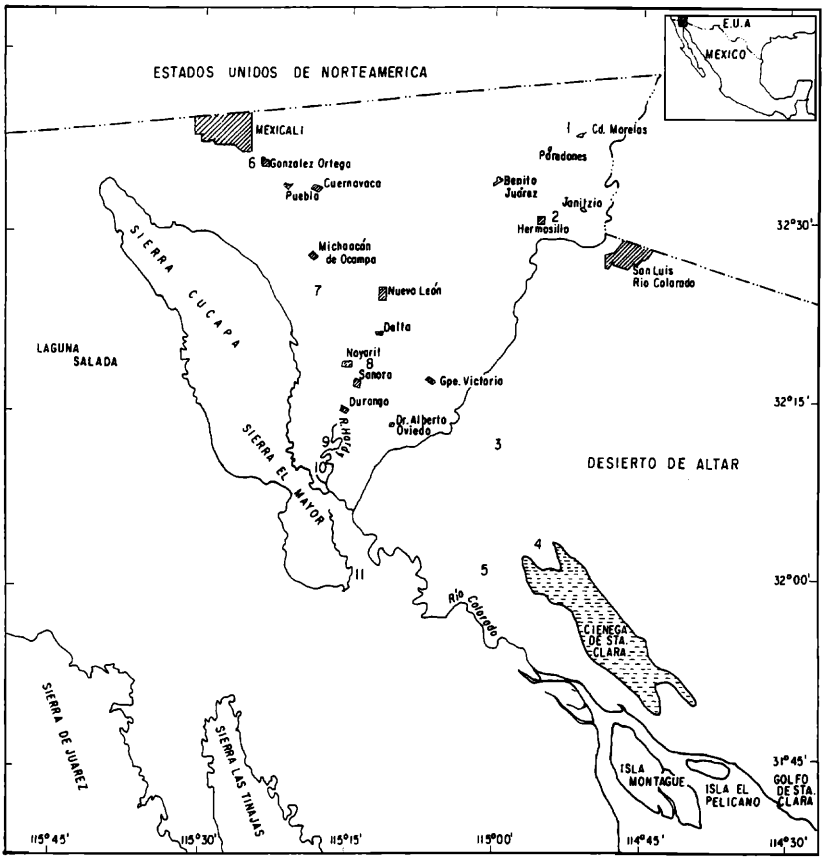

Figure 1. Burrowing Owl locations in the Mexicali Valley, Baja California. Numbers correspond to numbers in Appendix 1.

its entrance on Isla Piojo (Anderson pers. obs.). Burrows of the Black Chuckwalla (*Sauromalus hispidus*) are potential nesting sites for Burrowing Owls on gulf islands.

Anthony (1925), on his expedition to Guadalupe Island, visited all the coastal islands en route with the exception of San Geronimo and collected specimens at several locations on the mainland. He saw Burrowing Owls at San Quintín but not on the San Benitos, Natividad, and other nearshore islands where it had been reported as resident. Although his 1925 expedition extended from 9 July to 16 August, a time of year when these owls are less likely to be detected, he assumed that they had been exterminated by introduced cats. Neither Boswall (1978) nor Mellink (pers. obs. 11 July 1995) recorded any Burrowing Owls on these islands. The latter, however, noted large-scale habitat modification due to introduced domestic rabbits.

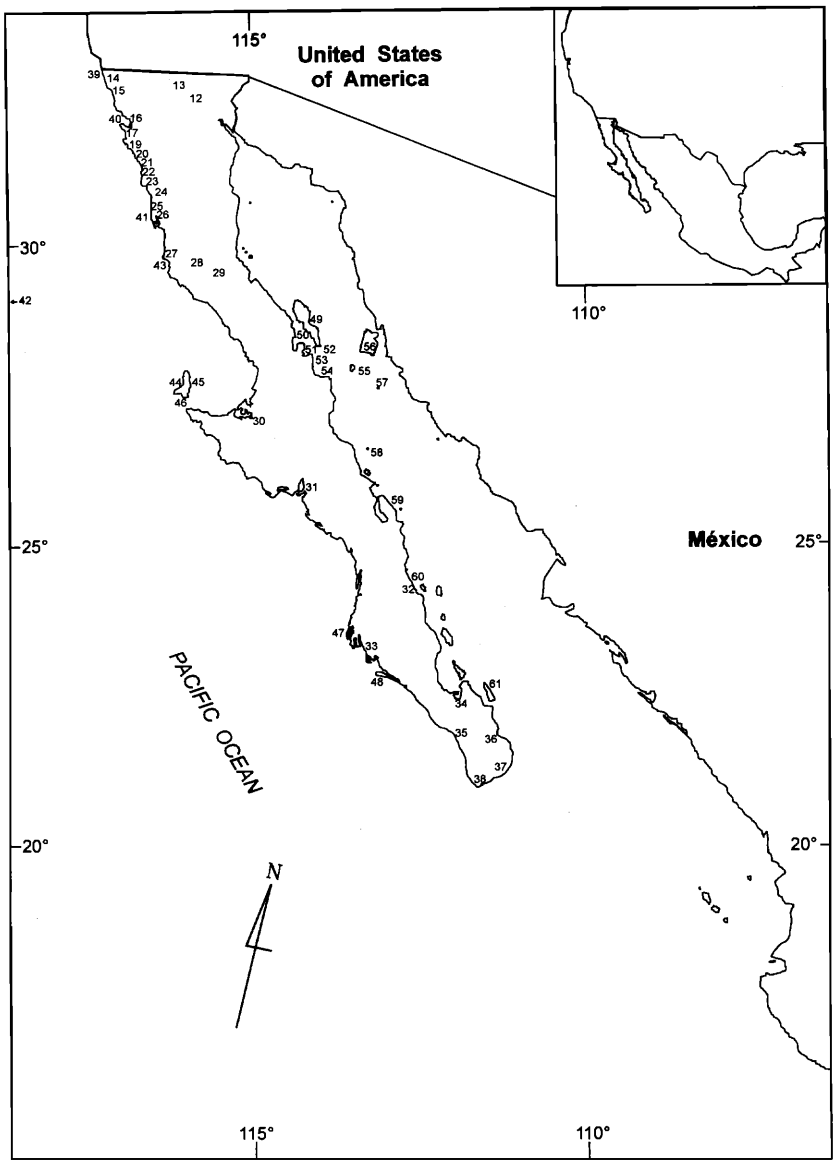

Figure 2. Burrowing Owl locations on the peninsula of Baja California and its associated islands, excluding the Mexicali Valley. Numbers correspond to numbers in Appendices 1 and 2.

Similarly, Bryant (1889) recorded Burrowing Owls on Santa Margarita Island, but Amador (1985) failed to observe them on any of his 21 visits (including 34 days of observation) from 1980 to 1984. On this island, feral cats prey upon nesting seabirds (Anderson et al. 1989).

The Burrowing Owl has been reported several times from Guadalupe Island, beginning with Bryant (1887). W. W. Brown's notes (in Thayer and Bangs 1908) on the Burrowing Owl in Guadalupe Island read "very common in the high, open, rocky country of the table lands, but not found in the pine or cypress woods." Apparently, the owl has endured the predation pressure from feral cats, as it is still widespread and common on the island (Jehl and Everett 1985). Mellink and Palacios (1990), however, did not see any owls on this island. Burrowing Owls occur also on Islote Negro, near the south end of Guadalupe (Jehl and Everett 1985).

In Baja California, Burrowing Owls have been recorded mostly on agricultural lands (43% of all records), especially along dirt embankments. They occur also in wetlands (18%), on open desert (15%), and in coastal sage scrub (12%). The largest concentration of Burrowing Owls (23 individuals) reported for Baja California was recorded during waterbird surveys along the Bordo Lerma flood-control dikes in the Mexicali Valley (Appendix 1, see Mellink et al. 1997 for a detailed map). This area and habitats are geographically and ecologically related to the Salton Sea area (Imperial Valley) where the species is widespread year round (Garrett and Dunn 1981, Rosenberg et al. 1991), although it is much less abundant in winter (P. Unitt pers. comm.). Along Bordo Lerma the winter population was much larger than that during the breeding season, although there was much variability within and between years (Mellink et al 1997). Local movements of Imperial Valley birds could account for the winter increase at Bordo Lerma.

In the Mexicali Valley, no Burrowing Owls were reported by Grinnell (1914), but van Rossem (1945) reported the species as a common breeder. Currently it is quite common and breeds in open areas near human habitation, especially along channel edges, including some in the city of Mexicali (Appendix 1). Therefore, the population of this owl in this area may actually have increased with the expansion of agriculture early this century (see Mellink 1995).

Although in low numbers, Burrowing Owls breed in the seven major coastal wetlands of Baja California: Punta Banda Estuary, San Quintín Bay, Ojo de Liebre (Scammon's) Lagoon, San Ignacio Lagoon, Magdalena Bay, La Paz Bay, and delta of the Colorado River. In these areas they prefer the upper salt marsh and playas with sand dunes (Massey and Palacios 1994). During May 1992 in San Ignacio Lagoon there were nine adult owls (including three pairs with two young each) along the sides of a road across the barren playa of the lagoon. The owl population at San Ignacio Lagoon is likely greater than in any other coastal wetland of Baja California, by virtue of the extensive playas that provide suitable habitat. To date, however, these playas have not been surveyed thoroughly. Recent (now abandoned) plans to construct the world's largest system of solar salt evaporation pond system at San Ignacio Lagoon would likely affect this population of resident Burrowing Owls, as well as Snowy Plovers (*Charadrius alexandrinus*; see Palacios et al. 1994).

Anthony (1893) saw Burrowing Owls "in several of the valleys between Tia Juana and San Telmo" between 27 May and 7 June 1893. At present most of these river valleys on the coastal plain of northwestern Baja California have been developed into housing and agriculture.

From the information presented, it is apparent that the Burrowing Owl is widespread though local in Baja California and that in some areas it has likely increased as a result of human transformation of the habitat. However, our information is scant and patchy, and comprehensive surveys, both during the breeding season and during the winter, remain to be done.

ACKNOWLEDGMENTS

This study was supported through a special award from the California Department of Fish and Game; we thank David Zezalak and Cynthia Chadwick for assistance. The Consejo Nacional de Ciencia y Tecnología (México) supported field work by Mellink, Palacios, and González. We greatly appreciate editorial assistance by Jeff Lincer and Philip Unitt. We thanks the following people for allowing us to use their unpublished field notes: A. D. Barron, S. Detwiler, T. Donahoe, G. Fernandez, R. Erickson, K. Garrett, R. Hamilton, S. N. G. Howell, J. Llinas, J. Luevano, L. Martinez, A. L. Mendez, M. A. Patten, K. A. Radamaker, G. Ruiz-Campos, M. San Miguel, D. E. Schmoldt, R. Webster, and T. E. Wurster. Richard Erickson also provided us with specimen data from three museums.

LITERATURE CITED

Abarca, F. J., Ingraldi, M. F., and Varela-Romero, A. 1993. Observations on the desert pupfish (*Cyprinodon macularius*), Yuma Clapper Rail (*Rallus longirostris yumanensis*) and shorebird communities in the Ciénaga de Santa Clara, Sonora, Mexico. Ariz. Game & Fish Dept., Phoenix.

Allen, J. A. 1909. [Review of] Thayer and Bangs on the birds of Guadaloupe Island. Auk 26:319–320.

Amador, E. S. 1985. Avifauna de Isla Santa Margarita, B.C.S., México. Bachelor's thesis. Univ. Autónoma Baja Calif. Sur.

American Ornithologists' Union. 1998. Check-list of North American Birds, 7th ed. Am. Ornithol. Union, Washington, D.C.

Anderson, D. W., Keith, J. O., Trapp, G. R., Gress, F., and Moreno, L. A. 1989. Introduced small ground predators in California Brown Pelican colonies. Colonial Waterbirds 12:98–103.

Anthony, A. W. 1893. Birds of San Pedro Martir, Lower California. Zoe 4:228–247.

Anthony, A. W. 1895. Birds of San Fernando, Lower California. Auk 12:134–143.

Anthony, A. W. 1925. Expedition to Guadalupe Island, Mexico, in 1922. The birds and mammals. Proc. Calif. Acad. Sci. 14:277–320.

Baird, S. F., Brewer, T. M., and Ridgway, R. 1874. A history of North American birds, land birds. Little, Brown, Boston.

Bancroft, G. 1922. Some winter birds of the Colorado Delta. Condor 24:98.

Banks, R. C. 1963a. Birds of Cerralvo Island, Baja California. Condor 65:300–312.

Banks, R. C. 1963b. Birds of the Belvedere expedition to the Gulf of California. Trans. San Diego Soc. Nat. Hist. 13:49–60.

Brewster, W. 1902. Birds of the Cape region of Lower California. Bull. Mus. Comp. Zool. 41:1–241.

Bryant, W. E. 1886. Cerros Island. Forest and Stream 27:62–64.

Bryant, W. E. 1887. Additions to the ornithology of Guadalupe Island. Bull. Calif. Acad. Sci. 2:269–318.

Bryant, W. E. 1889. A catalogue of the birds of Lower California, Mexico. Proc. Calif. Acad. Sci. 2:237–320.

Carter, M., Fenwick, G., Hunter, C., Pashley, D., Petit, D., Price, J., and Trapp, J. 1996. For the future—WatchList 1996. Field Notes 50 (3).

Clark, R. J. 1997. A review of the taxonomy and distribution of the Burrowing Owl. J. Raptor Res. Reports 9:14–23.

Cody, M. 1983. The land birds, in Island Biogeography in the Sea of Cortez (T. J. Case and M. L. Cody, eds.), pp. 210–245, 455–473. Univ. of Calif. Press, Berkeley.

De Sante, D. F., Ruhlen, E. D., Adamany, S. L., Barton, K. M., and Amin, S. 1997. A census of Burrowing Owls in central California. J. Raptor Res. Reports 9:38–48.

Enriquez-Rocha, P. L. 1997. Seasonal records of the Burrowing Owl in Mexico. J. Raptor Res. Reports 9:49–51.

Escofet, A., Loya-Salinas, D. H., and Arredondo, J. I. 1988. El Estero de Punta Banda (Baja California, México) como habitat de la avifauna. Ciencias Marinas 14:73–100.

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

Grinnell, J. 1928. A distributional summation of the ornithology of Lower California. Univ. Calif. Publ. Zool. 32:1–300.

Hang, E. A., Millsap, B. A., and Martell, S. 1995. Burrowing Owl (*Speotyto cunicularia*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 16. Acad. Nat. Sci., Philadelphia.

Howell, A. B. 1911. Some birds of the San Quentin Bay region, Baja California. Condor 13:151–153, 211.

Howell, T. R., and Cade, T. J. 1954. The birds of Guadalupe Island in 1953. Condor 56:283–294.

Howell, S. N. G., and Webb, S. 1995. A Guide to the Birds of Mexico and Northern Central America. Oxford Univ. Press, Oxford, England.

James, P. C., and Espie, R. H. M. 1997. Current status of the Burrowing Owl in North America: An agency review. J. Raptor Res. Reports 9:3–5.

Jehl, J. R., Jr., and Everett, W. T. 1985. History and status of the avifauna of Isla Guadalupe, Mexico. Trans. San Diego Soc. Nat. Hist. 20:313–336.

Kaeding, H. B. 1905. Birds from the west coast of Lower California and adjacent islands. Condor 7:105–111, 134–138.

Lamb, C. C. 1927. Notes on some birds of the southern extremity of Lower California. Condor 29:155–157.

Lincer, J. L. 1997. Toward an action plan: The results of the Burrowing Owl Workshop, 14 November 1992, Bellevue, Washington. J. Raptor Res. Reports 9:11–13.

Massey, B. W., and Palacios, E. 1994. Avifauna of the wetlands of Baja California, Mexico: Current status. Studies Avian Biol. 15:45–57.

McGregor, R. C. 1897. Nest and eggs of the San Benito Sparrow. Osprey 2:42.

Mellink, E. 1995. Status of the muskrat in the Valle de Mexicali and Delta del Río Colorado, México. Calif. Fish and Game 81:33–38.

Mellink, E., and Palacios, E. 1990. Observations on Isla Guadalupe in November 1989. W. Birds 21:177–180.

Mellink, E., Palacios, E., and González, S. 1997. Nonbreeding waterbirds of the delta of the Río Colorado, México. J. Field Ornithol. 68:113–123.

Murphy, R. C. 1917. Natural history observations from the Mexican portion of the Colorado desert with a note on the Lower Californian pronghorn and a list of the birds. Proc. Linn. Soc. New York 24–25:43–101.

National Wildlife Federation. 1989. Proceedings of the Western Raptor Management Symposium and Workshop. Natl. Wildlife Fed. Tech. Ser. 12.

Palacios, E., Alfaro, L., and Page, G. W. 1994. Distribution and abundance of breeding Snowy Plovers on the Pacific coast of Baja California. J. Field Ornithol. 65:490–497.

Rosenberg, K. V., Ohmart, R. D., Hunter, W. C., and Anderson, B. W. 1991. Birds of the Lower Colorado River Valley. Univ. of Ariz. Press, Tucson.

Ruiz-Campos, G., and Rodríguez-Meraz, M. 1997. Composición taxonómica y ecológica de la avifauna de los ríos El Mayor y Hardy, y áreas adyacentes, en el Valle de Mexicali, Baja California, México. An. Inst. Biol. Univ. Nac. Autónoma Mex., Ser. Zool. 68:291–315.

Sharpe, R. B. 1875. Catalogue of the Striges, or nocturnal birds of prey, in the collection of the British Museum. Br. Mus., London.

Short, L. L., Jr., and Crossin, R. S. 1967. Notes on the avifauna of northwestern Baja California. Trans. San Diego Soc. Nat. Hist. 14:283–299.

Tershy, B. R., and Breese, D. 1997. The birds of San Pedro Martir Island, Gulf of California, México. W. Birds 28:96–107.

Thayer, J. E. 1909. [Letters from W. W. Brown, Jr.]. Condor 11:142–143.

Thayer, J. E., and Bangs, O. 1907. Catalog of birds collected by W. W. Brown, Jr., in middle Lower California. Condor 9:135–140.

Thayer, J. E., and Bangs, O. 1908. The present state of the ornis of Guadaloupe Island. Condor 10:101–106.

Townsend, C. H. 1923. Birds collected in Lower California. Bull. Am. Mus. Nat. Hist. 48:1–26.

Van Rossem, A. J. 1909. Some unrecorded species from Los Coronados Islands, Mexico. Condor 11:208.

Van Rossem, A. J. 1945. A distributional survey of the birds of Sonora, Mexico. Occ. Papers Mus. Zool. La. State Univ. 21:1–379.

White, C. M. 1994. Population trends and current status of selected western raptors. Studies Avian Biol. 15:161–172.

Wilbur, S. R. 1987. Birds of Baja California. Univ. Calif. Press, Berkeley.

Willett, G. 1913. Bird notes from the coast of northern Lower California. Condor 15:19–24, 184.

Accepted 1 May 2000

Appendix 1. Historical and recent records of Burrowing Owls on the peninsula of Baja California, México.

Colorado Delta Region

1. Alamo River, 24 Jan 1928, 1, collected, riparian (Grinnell 1928; W. E. Ritter, MVZ 52115).
2. HW 2 Ejido Hermosillo, 28 Aug 1998, 15, agricultural (A. L. Mendez).
3. N of Estación Coahuila, 4 Jun 1998, 2, adult and young, agricultural (our data). Mexicali Valley, 10 May 1997, 19, agricultural (R. A. Hamilton, S.N.G. Howell); 11 Jun 1997, 2–3, agricultural (S. N. G. Howell, M. San Miguel); 3 Aug 1997, 4, agricultural (R. A. Erickson, R. A. Hamilton, S. N. G. Howell).
4. Ciénaga de Santa Clara–Wellton Mohawk Canal, 4 Jun 1998, 4, adults and young, riparian (our data). Discharge channel to the Ciénaga de Santa Clara, 13–17 Oct 1992, 6 (Abarca et al. 1993).
5. Bordo Lerma, 8 Sep 1993, 0; 2 Nov 1993, 0; 6 Dec 1993, 16; 11 Jan 1994, 23; 8–9 Feb 1994, 0; 22 Mar 1994, 9; 6 Apr 1994, 12, agricultural (our data); 1 Apr 1996, 3, agricultural (S. Detwiler). Colorado delta region, 29 Mar–19 Apr 1915, not uncommon, desert (Murphy 1917); 22–23 Jan 1922, present, agricultural (Bancroft 1922).
6. Mexicali (south end), 31 Mar 1994, 2, agricultural (our data). Colonia Robledo, 6 May 1996, 12, adults and young, agricultural (J. Luevano). Mexicali, 4 Sep 1995, 1 (S. N. G. Howell, K. A. Radamaker).
7. Cerro Prieto, 13 Mar 1991, 4, adults and young; 4 Jun 1998, 6, adults and young, agricultural (our data).
8. Between ejidos Nayarit and Sonora, 17 Jun 1997, 3; 7 Aug 1997, 2, agricultural (G. Ruiz-Campos).
9. Río Hardy, 3–4 Oct 1995, 4, riparian (J. Luévano). Río Hardy area, 22 Apr 1984, 3; 21 Aug 1984, 1; 28 Mar 1985, 1 (R. Webster). Cucapa Indigena, 5 Feb 1995, 1; 9 Sep 1995, 1 (Ruiz-Campos and Rodríguez-Meraz 1997). Between Rancho El Caiman and Highway 4, 22 Apr 1995, 4 (Ruiz-Campos and Rodríguez-Meraz 1997). Ejido Monterrey, 22 Apr 1995, 1 (Ruiz-Campos and Rodríguez-Meraz 1997).
10. El Mayor, 8 May 1971, 1, agricultural (Wilbur 1987).
11. Yuri Muri, south of Mexicali, 12 May 1981, 1, agricultural (our data). San Felipe road, 31 Mar 1994, 1, desert (our data).

Northwestern Baja California

12. Rancho Neji, 27 Apr 1995, 1, riparian (our data).
13. Tecate, summer 1996, 1, agricultural (our data).
14. Tijuana, 25 Dec 1903 (W. E. Ritter, MVZ 5929). Playas de Tijuana, summer 1987, 2, adult and young, coastal sage scrub (our data).
15. Rosarito, 16 Jul 1976, 2, coastal sage scrub, adult and young (Wilbur 1987).
16. San Antonio de Las Minas, 2 Nov 1996, 1, agricultural (our data). Between El Tigre and San Antonio de Las Minas, 21 May 1996, 4, agricultural (our data).
17. N of Ensenada, 15 May 1979, 1, coastal sage scrub (our data). Mouth of Arroyo Ensenada, 9 Jan 1994, 1 (R. A. Erickson, R. A. Hamilton, S. N. G. Howell, M. A. Patten, P. Pyle); 24 Feb 1985, 2, collected, sand dunes (G. Gómez, UABC). Laguna El Ciprés, 12 Oct 1988, 1, agricultural (our data); 2 Aug 1997, 1, agricultural (R. A. Erickson, R. A. Hamilton, S. N. G. Howell); 5 Oct 1997, 2, agricultural (our data); 20 Jul 1998, 2, adult and young, agricultural (our data). El Ciprés Airport, 2 Jul 1999, several, agricultural (R. A. Hamilton, S. N. G. Howell); 6 Jul 1999, a few, agricultural (R. A. Hamilton, S. N. G. Howell). On road to Punta Banda, just south of Ensenada, 3 Jan 1979, 1, irrigation dike (D. E. Schmoldt). Estero Punta Banda, spring–summer 1985, 1, wetland (Escofet et al. 1988); fall

1995, 1, wetland (G. Fernández); 10 Jan 1996, 1, wetland (S. N. G. Howell). Maneadero, 2 Jun 1996, 1, agricultural (our data). Valle de Maneadero, 18 Jul 1998, 6, adults and young, agricultural (our data). Punta Banda, between La Bufadora and Villarino, 6 Jan 1985, 1, chaparral/grass edge (D. E. Schmoldt).

18. Ojos Negros, 1–19 Apr 1967, 3, adults and young, riparian (Short and Crossin 1967); 22 Feb 1998, 2 pairs (R. A. Erickson, R. A. Hamilton, S. N. G. Howell). Marsh north of Ojos Negros, 14 Oct 1996, 2 (R. A. Erickson, R. A. Hamilton, S. N. G. Howell). Real del Castillo (old), 5 Jun 1995, 1; 5 Jun 1996, 1, agricultural (our data).
19. Santo Tomas, 4 Apr 1997, 1, agricultural (our data).
20. 7 km N of San Vicente, 6 Jul 1993, 1 (A. D. Barron, R. A. Erickson, T. E. Wurster). N of San Vicente, 9 Jul 1984, 3, adults and young, agricultural (our data).
21. San Antonio del Mar, 29 May 1991, 3, coastal sage scrub, adults and young (our data); 10 Jul 1996, 1, agricultural (our data).
22. Punta Colonet, 11 Jun 1996, 1, coastal sage scrub (our data).
23. San Telmo, 16 May 1996, 1, agricultural (our data).
24. Bocana de Santo Domingo, 18 Mar 1925, 1, riparian (A. E. Borell, MVZ 47243); 20 Jun 1980, 2, riparian (Wilbur 1987); 30 May 1993, 1, riparian (our data).
25. Field northeast of Laguna Figueroa, 26 Sep 1999, 1, agricultural (R. A. Hamilton, S. N. G. Howell). Laguna Figueroa south, 29 May 1993, 2, wetland (our data).
26. Bahía de San Quintín, 26 Apr–3 May 1910, several, coastal sage scrub–desert (Howell 1911); 18–21 Jul 1925, seen, coastal sage scrub–desert (Anthony 1925); 30 Nov 1974, 23 Dec 1974, 1, coastal sage scrub–desert (Wilbur 1987). San Quintín valley, 18 Dec 1981, 1, agricultural (our data). San Quintín, 29 Dec 1983, 4; 29 Jun 1984, 2; 3 Jul 1987, 1 juv.; 3 Jul 1992, 1 (R. E. Webster); 31 Mar 1996, 1, agricultural (our data). Mouth of Cañón de Agua Chiquita, 5 Jul 1991, 1, coastal sage scrub (our data). Bahía de San Quintín, Muelle Viejo, 9 Feb 1991, 18, agricultural; 16 Nov 1996, 1, coastal sage scrub (our data). Bahía de San Quintín, saltpond 1, 27 May 1993, 6, adults and young, coastal sage scrub; saltpond 3, 27 May 1993, 3, coastal sage scrub, adults and young (our data). Bahía de San Quintín, Punta Azufre, 29 May 1993, 1, wetland (our data). Bahía de San Quintín, English Graveyard, Aug 1995, 1, wetland (T. Donahoe). Bahía San Simon north, 29 May 1993, 1, wetland (our data).

Central Desert of Baja California

27. El Rosario, Nov 1906, 8, desert (Thayer and Bangs 1907).
28. Near San Fernando, 26 Apr–25 Jun 1894, a few, desert (Anthony 1895).
29, "San Jabier" (San Javier), Mar 1906, 8, desert (Thayer and Bangs 1907)

Vizcaino Desert

30. Guerrero Negro, 30 Jun 1975, 3, desert (Wilbur 1987); 16 Jan 1981, 1, desert (D. E. Schmoldt, Wilbur 1987). Estero de San José, W of Guerrero Negro, 8–10 Jan 1985, 2, old salt works (D. E. Schmoldt, Wilbur 1987). E shore of Estero de San Jose, W of Guerrero Negro, 8 Jan 1987, 1, old salt works (D. E. Schmoldt).
31. Laguna San Ignacio, 6–8 Feb 1979, 1, desert (K. Garrett, Wilbur 1987). Laguna San Ignacio NW, 29 May 1992, 7, adults and young, wetland (our data). Laguna San Ignacio, El Cardón, 20 May 1992, 1, desert (our data). Laguna San Ignacio, El Delgadito, 20 May 1992, 1, wetland (our data).
Road to Punta Abreojos, 29 Mar 1998, 17, desert (L. Martinez). Isla Pelícanos, 1 May 1998, 1, desert (our data).
32. Loreto, 16 Feb 1991, 1 (A. D. Barron, R. A. Erickson, R. A. Hamilton).
33. Bahía Magdalena, before 1875, 1, desert (Sharpe 1875).

Cape Region

34, La Paz, 4 Apr 1887, 1, desert (Brewster 1902). 19 km N of La Paz, 8 Mar 1973, 2, desert (our data). Ejido Chametla, 5 Jun 1986, 1, desert (our data). Ejido Alfredo V. Bonfil, May 1991, 1 pair, abandoned field (J. Llinas). 3 km N of El Centenario, Feb 1998, 1 pair, desert (J. Llinas).
35. Todos Santos, 3 Oct 1923, 1, desert (Lamb 1927).
36. Miraflores, 20 Jan 1909, 3, subtropical deciduous scrub (Thayer 1909). Eureka, 20 Jan 1909, 1, subtropical deciduous scrub (Thayer 1909).
37. San José del Cabo, before 1874, ?, subtropical deciduous scrub (Baird et al. 1874); 26 Oct 1887, 1, subtropical deciduous scrub (Brewster 1902); 12 Apr 1923, 1, subtropical deciduous shrub (Lamb 1927).
38. Cabo San Lucas, before 1874, ?, subtropical deciduous scrub (Baird et al. 1874).

Appendix 2. Historical and recent records of Burrowing Owls on the offshore islands of Baja California peninsula (including those belonging to Sonora).

39. Los Coronados, 8 Apr 1909, 1 (van Rossem 1909, UCLA 11137).
40. Todos Santos, 10 Mar 1897, not uncommon (Kaeding 1905); 12 and 16 Jan 1927, 2, collected (Grinnell 1928, C. C. Lamb, MVZ 49817); 25 Jan 1980, 1; 2 Feb 1980, 1; 18 Feb 1981, 1, (R. LeValley); Todos Santos Sur, 27 Feb 2000, 1 (M. A. Patten, E. Mellink).
41. San Martín, 10 Feb 1979, 1 (K. Garrett and others).
42. Guadalupe, Jan 1885, 2, collected (Bryant 1887); 6 May–17 Jun 1902, 27 (Thayer and Bangs 1908); 16 May 1906 (J. A. Thayer, Field Museum of Natural History); 31 Jan 1950, 3; 11 Jun 1950, 2; 11 Jun 1953, 2 (Howell and Cade 1954); 18 Sep 1986, 1, collected (L. Quintana, UABC 350).
43. San Jerónimo, 14 Apr 1912, 1 (Willett 1913).
44. San Benitos, 27 Mar 1897, not common (Kaeding 1905); 30 Mar 1897, 1 (McGregor 1897); 9 Mar 1911, 1 (Townsend 1923); E San Benito, 21 Feb 1930 (UCLA 29819); W San Benito, 18 Dec 1973, 1 (Wilbur 1987);
45. Cedros, 7 Jan 1885, 1 (Bryant 1886).
46. Natividad, before 1925, resident (Anthony 1925).
47. Magdalena, March 1889, 1 or 2 (Bryant 1889).
48. Santa Margarita, 1 Mar 1889, 1 (Bryant 1889).
49. Ángel de la Guarda, 10 Apr 1911, 1 (Towsend 1923).
50. Piojo, 26 Mar 1974, 1 (our data).
51. Cardonosa, 27 Apr 2000, carcass (our data).
52, Rasa (Cody 1983).
53. Salsipuedes, 27 Apr 1978, 1 (our data); 20 Jan 1984, 1 (M. Harris).
54. San Lorenzo Norte (Las Ánimas), 1 Mar 1971, 1 (our data).
55. San Esteban, 12 Jan 1932, "common winter visitant" (van Rossem 1945, UCLA 38805).
56. Tiburón, winter 1932, "common winter visitant" (van Rossem 1945, Case in Cody 1983).
57. San Pedro Mártir (Cody 1983); 4–14 Mar 1992, 1 (Tershy and Breese 1997).
58. Tortuga, 29 Oct 1999, 1 (our data).
59. San Ildefonso, 24 Mar 1930, desert (J. E. Green, MVZ 57155); 1 (Case in Cody 1983).
60. Coronados, 3 Apr 1962 (Banks 1963b).
61. Cerralvo, 12 Feb 1906, 1 (Nelson and Goldman, USNM 197772, in Banks 1963b).