

THE BARRED OWL (*STRIX VARIA*) INVASION IN CALIFORNIA

SHAWNA J. DARK,^{1,3} R. J. GUTIÉRREZ,^{1,4} AND GORDON I. GOULD, JR.²

¹Department of Wildlife, Humboldt State University, Arcata, California 95521, USA; and
²California Department of Fish and Game, Wildlife Management Branch, 1416 Ninth Street,
Sacramento, California 95814, USA

ABSTRACT.—We estimated the range expansion of Barred Owls (*Strix varia*) in California and the potential negative effects this species may have on Spotted Owls (*Strix occidentalis*). Barred Owl range expansion has been rapid over the past two decades. A total of 61 Barred Owls has been detected in 12 different California counties. Barred Owls were first sighted in California in 1981 in Del Norte and Trinity counties. They now have been detected as far south as Sonoma County in western California and Yuba County in the Sierra Nevada. The ratio of new Barred Owl sites found per new Spotted Owl territory has increased from one per 50 Spotted Owl territories in the 1980s to one per 10 to 20 new Spotted Owl territories in the mid 1990s. This suggests that the Barred Owl population in California is increasing. In addition, seven Barred Owl × Spotted Owl hybrids have been reported in California. Because of the potential for hybridization, competition for food and habitat, and predation, it appears that the Barred Owl could influence Spotted Owl populations negatively. Received 12 December 1996, accepted 19 May 1997.

THE BARRED OWL (*Strix varia*) has been expanding its range into the western United States (Shea 1974, Taylor and Forsman 1976, Dunbar et al. 1991). Historically, Barred Owls occurred from south-central Mexico north through the southern United States and into eastern North America south of the boreal forest (Johnsgard 1988). However, their distribution has expanded in a westerly direction over the past six decades, and they now are common in southwestern British Columbia, western Washington, western Oregon, and other areas of the northern Rocky Mountains (Grant 1966, Taylor and Forsman 1976, Boxall and Stepney 1982, Sharp 1989, Gilligan et al. 1994). Barred Owls were first documented in California in 1981 (Evens and LeValley 1982). They have successfully colonized a variety of forested and riparian habitats, including old-growth and mature forests that also are used by Northern Spotted Owls (*Strix occidentalis caurina*; Hamer 1988, Dunbar et al. 1991).

The recent range expansion of Barred Owls into the Pacific Northwest may have a negative effect on Spotted Owls (e.g. Taylor and Forsman 1976, Dunbar et al. 1991). Barred Owls are slightly larger than Spotted Owls, are more ag-

gressive in interactions with them, and have similar (but distinct) vocalizations (Dunbar et al. 1991, Hamer et al. 1994). Several interactions between Barred Owls and Spotted Owls have resulted in Spotted Owls leaving the area temporarily and/or permanently (Hamer 1988, Tanner and Gutiérrez unpubl. data). Also, Barred Owls hybridize with Spotted Owls, albeit not extensively (Hamer et al. 1994). These potentially negative interactions between the species, coupled with loss of suitable habitat for Spotted Owls, have added to the concern over the Barred Owl's range expansion.

Hamer et al. (1994) and Morlan et al. (1987) noted some of the recent observations of Barred Owls in California. However, there has been little documentation of the broad-scale range expansion of Barred Owls in California. In this paper, we discuss the range expansion of Barred Owls over the past two decades in California and its possible effects on Spotted Owls.

METHODS

Data were collected from three main sources. An extensive database of Barred Owl and Spotted Owl sightings in California has been maintained by the California Department of Fish and Game. This database has been updated yearly and includes information about all reported Barred Owl detections in California, including the type of detection (visual, auditory, or both), location and date of detection, and

³ Present address: 1385 Chamberlain Road, Pasadena, California 91103, USA.

⁴ Address correspondence to this author. E-mail: rgj4@axe.humboldt.edu

the observer. Because there have been no systematic surveys for Barred Owls, most sightings have been incidental to Spotted Owl surveys. Since the federal listing of the Northern Spotted Owl as a threatened subspecies in 1990, there have been more than 4,000 timber-sale consultations (each having a minimum of 20 to 30 associated individual owl surveys) conducted on nonfederal lands and an additional tens of thousands of surveys conducted on federal lands in northwestern California (A. Gonzales pers. comm.). Therefore, this database reflects more than 100,000 owl surveys. A second source of information was derived from a four-year survey of Spotted Owls in Redwood National/State Parks (RNSP) in Humboldt and Del Norte counties. The final source was derived from 17 years of Northern Spotted Owl studies (the past 12 years devoted to population studies) in the five northwesternmost counties of California. The purpose of these studies was to assess the population dynamics of Northern Spotted Owls; therefore, effort was extensive and thorough over very large areas (see Franklin et al. 1996a).

The RNSP project lasted from 1993 to 1996. Each year a different region of the study area was surveyed. Research in northwestern California was initiated in 1980. In 1985, the Regional study area (parts of Humboldt, Mendocino, Siskiyou, and Trinity counties) and the Willow Creek study area (parts of Humboldt and Trinity counties) were established to study population dynamics (Franklin et al. 1996a). These two intensive studies (hereafter "NSOSA") provided data from particular regions of California and allowed us to answer distributional questions that could not be answered using the statewide data. Studies were conducted following protocols specific to Spotted Owls (Franklin et al. 1996b). At both study areas, technicians were trained in distinguishing Spotted Owl vocalizations from those of Barred Owls. When identification of a species was not clear, a more experienced biologist visited the area for confirmation.

Sightings from each data source were assigned to Barred Owl "sites." Because little was known about Barred Owl ecology and territory size in the Northwest, the delineation of Barred Owl sites was difficult. Therefore, we defined Barred Owl sites using a similar definition for Spotted Owls. Spotted Owl territories have been defined as an area where Spotted Owls exhibit territorial behavior in response to surveys on two or more occasions separated by one or more weeks within a given year (Franklin et al. 1996a). However, because there were no systematic surveys for Barred Owls, the criterion of having a response on two or more occasions was not always met. Therefore, we did not define locations where Barred Owls were detected as "territories," but rather as "sites" to insure that these locations were not construed as permanent territories. We found that unique Barred Owl sites were separated by a dis-

tance of 6 to 9 km. By comparison, nearest-neighbor distances for Spotted Owls at Willow Creek averaged 1.6 km in 1990 (the halfway mark for the demography study; Hunter et al. 1995).

Barred Owl sites were placed into three time periods based on date of first detection: (1) 1981 to 1985, (2) 1986 to 1990, and (3) 1991 to 1996. These time periods corresponded to the establishment of statewide surveys by the U.S. Forest Service, the establishment of demographic studies in northwestern California and the Sierra Nevada, and intensive surveys for Spotted Owls on private lands mandated by the U.S. Fish and Wildlife Service after the Spotted Owl was listed, respectively. Therefore, each time period represented a substantial increase in owl survey effort. Barred Owl sites from each time period were then plotted on a map of California using PC ArcInfo 6.0 (ESRI, Redlands, California). Isoleths around the outermost locations were drawn onto the maps to provide a visual interpretation of Barred Owl range expansion.

Next, we plotted the number of Barred Owl sites identified by time period to obtain a graphical interpretation of the history of Barred Owl detections. Because many Barred Owl detections occurred during Spotted Owl surveys, we were concerned that the increase in the number of Barred Owl sites over time resulted from an increase in Spotted Owl surveys and not from a true range or population expansion. To examine this relationship, we graphed the ratio of new Barred Owl sites found to new Spotted Owl territories found per year. This allowed us to determine the effect of Spotted Owl surveys on the detection of Barred Owls by decreasing the influence of effort associated with repeated visits to a Spotted Owl territory to assess occupancy, nesting status, or reproductive success. If the number of Barred Owls was not increasing, we would expect to see this ratio remain constant over time.

Finally, we used data from the RNSP and NSOSA projects to estimate the average elevation of Barred Owl sites and Spotted Owl territories. We made a univariate comparison of Barred Owl elevation and Spotted Owl elevation for the RNSP study area with a two-sample *t*-test for unequal sample size and variance (SPSS 6.1). Because the sample size of Barred Owl sites was small ($n = 5$) on the NSOSA compared with the number of Spotted Owl territories ($n = 90$), we did not make univariate comparisons. However, we reported the average elevation of Barred Owl sites and Spotted Owl territories for the NSOSA. We also presented the median elevation of Northern Spotted Owl territories and Barred Owl sites from the California Department of Fish and Game regional database of Spotted Owl surveys. We did not calculate mean values for the regional database because the data were not normally distributed. Also, we did not analyze elevations of California Spotted Owl (*Strix o. occidentalis*) territories because of the small

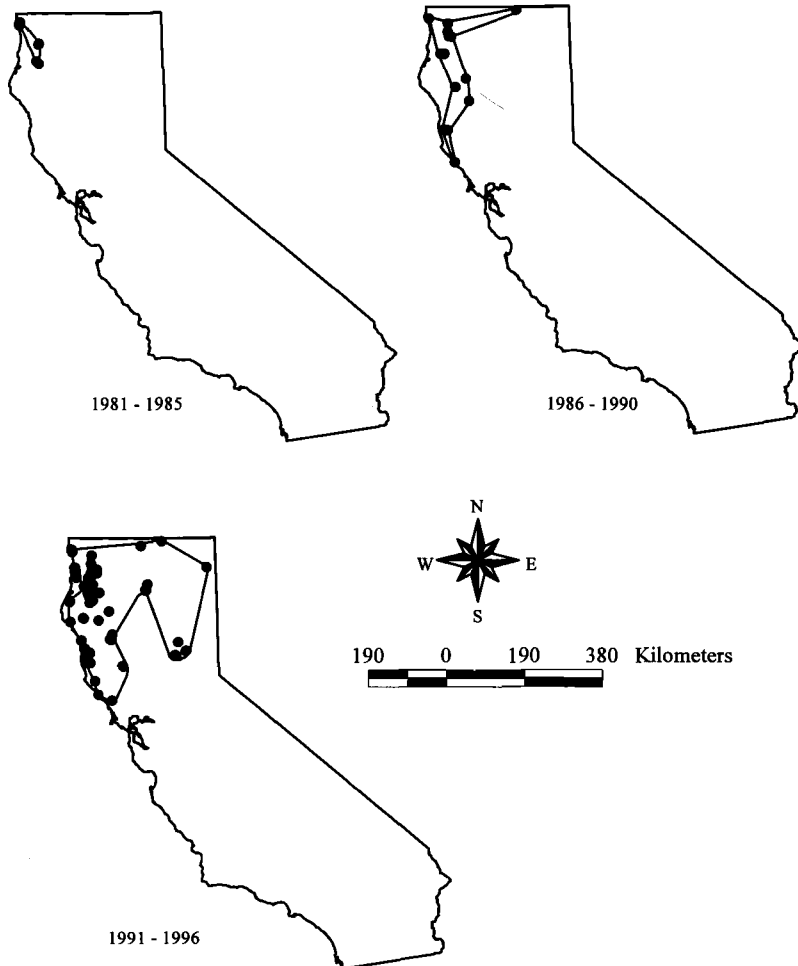


FIG. 1. Range expansion of the Barred Owl in California. Filled circles represent Barred Owl sites that were detected within each time period. The nonforested Central Valley of California was not included in range isopleths.

sample of Barred Owls within the range of California Spotted Owls (i.e. Sierra Nevada). We did not analyze regional data further because the greater density of Barred Owls in coastal locations potentially could bias regional comparisons of elevation.

RESULTS

We identified 61 Barred Owl sites that occurred in 12 California counties since 1980; 73% of these sites were occupied by single Barred Owls, 11% by pairs of Barred Owls, and 5% were unknown regarding owl social status. Seven hybrids between Barred Owls and Spotted Owls also were reported in California within the last decade. The first two hybrids were

reported in 1991 in Nevada (eastern California) and Del Norte (northwestern California) counties.

There were few Barred Owl sightings reported from 1981 to 1985 compared with more recent years despite the initiation of statewide Spotted Owl surveys by the U.S. Forest Service (Fig. 1). The first documented sightings in California were in 1981 about 5 km east of Crescent City, Del Norte County, and at Salyer, Trinity County (Evens and LeValley 1982). A belated report was received by the California Department of Fish and Game of a Barred Owl detected in Mendocino County in 1978. This detection was not confirmed by a biologist until

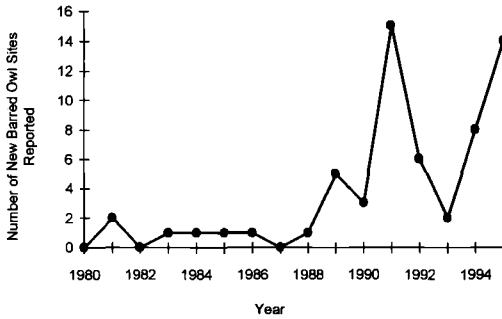


FIG. 2. Number of new Barred Owl sites reported in California from 1980 to 1995. Each observation was divided by the sum of all detections within a site during a single year.

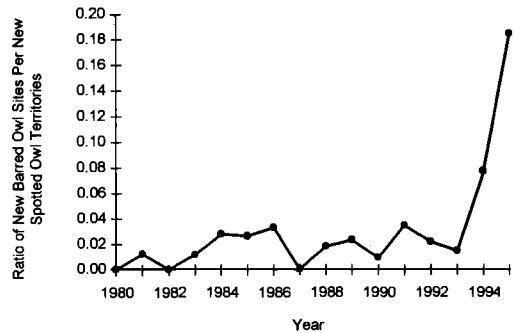


FIG. 3. The ratio of new Barred Owl sites detected per new Spotted Owl territories. Ratios were calculated separately for each year.

1989. Therefore, we included this observation only in the time period from 1986 to 1990. In 1983, we observed Barred Owls in Humboldt County, and the first breeding pair of Barred Owls was reported in the Klamath National Forest during 1991 (T. Hacking pers. comm.). The first sighting of a Barred Owl in northeastern California was in 1986 at Tule Lake (Morlan et al. 1987), and the first sighting in the Sierra Nevada was in 1991 in Nevada County.

From 1986 to 1996, Barred Owl detections appeared to expand to the south and east (Fig. 1). Barred Owls were detected as far east as the Warner Mountains, Modoc County, and as far south as the Russian River, Sonoma County (Coast Range), and Nevada County (Sierra Nevada). Extensive surveys of Spotted Owls were implemented throughout northern California, the central Sierra Nevada, and southern California in the late 1980s and early 1990s.

Our data indicate that Barred Owl detections began to increase in the early 1980s (Fig. 2). Evidence also indicates an accelerated increase in Barred Owl detections during the mid-1990s (Fig. 2). Furthermore, the ratio of new Barred Owl sites to new Spotted Owl territories suggests that the population of Barred Owls in California has increased. From 1980 to 1993, there were 0 to 0.035 new Barred Owl sites found per new Spotted Owl territory (Fig. 3). In 1994 and 1995, there were 0.077 and 0.184 new Barred Owl sites found per new Spotted Owl territory (Fig. 3). This represents an increase from one new Barred Owl site found per 50 new Spotted Owl territories to one new Barred Owl site found per 10 to 20 new Spotted Owl territories.

Barred Owls probably were not present in California prior to initiation of Spotted Owl surveys; 132 new Spotted Owl territories were located from 1970 to 1974, averaging 26.4 sites per year. From 1975 through 1979, 160 new Spotted Owl territories were located, averaging about 32 sites per year. From 1980 through 1984, the number of new Spotted Owl territories ranged from 159 in 1981 to 36 in 1984. Despite the relatively constant effort, Barred Owls were not detected until the beginning of the latter period, when an increase in sites became more apparent. In addition, early naturalists did not detect Barred Owls in California (e.g. Grinnell and Miller 1944).

At the RNSP study area, 8 Barred Owl sites and 47 Spotted Owl territories were identified. The average elevation at Barred Owl sites ($163 \pm \text{SE of } 47 \text{ m}$) was significantly lower than that at Spotted Owl territories ($258 \pm 54 \text{ m}$; $t = 4.14$, $df = 120$, $P < 0.001$). Six Barred Owl sites and 90 Spotted Owl territories were identified on the NSOSA. The average elevation of Barred Owl sites was $794 \pm 84 \text{ m}$, and the average elevation of Spotted Owl territories was $850 \pm 30 \text{ m}$. Using the California Department of Fish and Game regional database, Barred Owl sites had a median elevation of 305 m and Spotted Owl territories a median elevation of 762 m.

DISCUSSION

The range expansion of Barred Owls in California has been rapid and widespread. Because of early owl survey efforts and the rich tradition of natural history studies in California, we are confident that Barred Owls were

not present in California before the late 1970s or early 1980s. The increase in the number of Spotted Owl surveys during the 1980s probably is not the only factor in the increase in Barred Owl sites during the same period. Shortly before federal listing of the Northern Spotted Owl in 1990, private companies began surveying for Spotted Owls in earnest. Therefore, if an increase in Barred Owl sites resulted from an increase in Spotted Owl surveys, one would have expected a large increase in the number of Barred Owl sites during the early 1980s (following the U.S. Forest Service surveys) with another large increase after the federal listing of the Northern Spotted Owl in 1990. We did see this trend following 1990. Over the past five years, however, more effort has been devoted to monitoring existing sites than to finding new ones (except for new timber sale consultations). Of the 61 Barred Owl sites reported in California since 1980, 14 (23%) were reported in 1995 alone. Thus, there appears to have been a more recent population increase that does not correspond to increased survey efforts. Increased awareness by field technicians in differentiating Barred Owls from Spotted Owls may have played a role in the increase in Barred Owls, but it is unlikely that the increase was due solely to observer awareness. Finally, the high proportion of single Barred Owls, Barred Owls paired with Spotted Owls, and the presence of hybrids is characteristic of an increasing and recently arrived population (Johnston 1961, Pielou 1979).

The increase in Barred Owls in California may have a negative effect on Spotted Owls. Barred Owls have been detected in coastal Redwood forests, Douglas-fir (*Pseudotsuga menziesii*) forests of the Klamath physiographic province, and in the mixed conifer forests of the northern Sierra Nevada. Barred Owls also have colonized and maintained populations in a variety of habitat types from Canada to Oregon (Taylor and Forsman 1976, Boxall and Stepney 1982, Hamer 1988, Dunbar et al. 1991). Thus, Barred Owls apparently have the ability to use a variety of habitats in both disturbed and undisturbed conditions (Hamer 1988, Dunbar et al. 1991). Throughout the Pacific Northwest, biologists have hypothesized that Barred Owls have a negative effect on Spotted Owl populations (Taylor and Forsman 1976, Hamer 1988, Dunbar et al. 1991). This effect occurs, in part,

because Barred Owls use old-growth and mature forests and can displace Spotted Owls in territorial interactions (Hamer 1988, Tanner and Gutiérrez unpubl. data). In addition, extensive forest fragmentation (i.e. disturbed forest) appears to have a negative effect on Spotted Owls (Johnson 1992), whereas Barred Owls readily use these disturbed habitats (Hamer 1988, Dunbar et al. 1991). Therefore, Barred Owls may prove to be better competitors or more adaptable than Spotted Owls in areas where timber harvesting has altered Spotted Owl habitat.

Johnson (1994) argued that the range expansion of Barred Owls did not result from an increase in forest fragmentation. He suggested that because Barred Owls in the eastern United States and British Columbia use undisturbed forests (Campbell et al. 1990), their range expansion most likely was due to natural causes. However, Dunbar et al. (1991) found that in British Columbia, Barred Owls expanded into a variety of habitats, not just old-growth and mature (i.e. undisturbed) forests. Hamer (1988) also reported that Barred Owls in Washington occurred more often in low elevation mixed deciduous-coniferous forests than in undisturbed old growth. Finally, biologists in the eastern United States found that deciduous-coniferous forest was the primary habitat type used by Barred Owls (Dunstan and Sample 1972, Nicholls and Warner 1972).

The failure of Barred Owls to colonize western North America prior to recent times may be due to the absence of anthropogenic influences. The establishment of riparian forests and the planting of trees occurred simultaneously with human settlement of the Northern Great Plains (Knopf 1994). These actions may have provided habitat for Barred Owls that facilitated their dispersal across the midwestern United States and southern Canada. Once in the Rocky Mountains, the mosaic of habitats created by logging across western Canada would seem to favor the flexible habitat-selection patterns exhibited by Barred Owls. Thus, although logging may not be directly responsible for the invasion of Barred Owls in the Pacific Northwest, it probably facilitated their colonization. Additional research on habitat use and distribution of Barred Owls in western North America needs to be conducted to better understand the pattern of their range expansion.

Interspecific interactions also indicate that Barred Owls may have a negative effect on Spotted Owls. Interactions between Barred Owls and Northern Spotted Owls often result in Barred Owls dominating the encounters (Hamer 1988, Tanner and Gutiérrez unpubl. data). In our study areas, we documented the displacement of two Northern Spotted Owl pairs by Barred Owl pairs. Although this displacement may not seem numerically significant, given the low density of Barred Owls relative to Northern Spotted Owls in both of these areas, it may have been indicative of a potential negative effect on Northern Spotted Owls.

In addition to direct competition, a possible instance of predation of a Northern Spotted Owl by a Barred Owl occurred on the RNSP study area. In May 1997, a freshly killed adult Spotted Owl was found dead on a trail (T. Leskiw pers. comm.). An agitated Barred Owl detected at the site had mottled brown feathers (i.e. resembling those of a Spotted Owl) stuck to its talons. Subsequent dissection by R.J.G. showed that the trauma was consistent with an avian predator. Habitat conditions and local population distribution in RNSP largely eliminated Northern Goshawks (*Accipiter gentilis*) and Great Horned Owls (*Bubo virginianus*) as potential predators of this bird. Therefore, it was likely that the Spotted Owl was killed by the Barred Owl that was observed at the scene.

Hybridization also may have negative effects on Spotted Owls in California. Hybridization can affect the Spotted Owl directly by influencing reproductive success and population dynamics and indirectly by affecting its conservation status. For example, Mallards (*Anas platyrhynchos*) hybridized successfully with closely related congeners in North America, including the Mexican Duck (*Anas p. diazi*). The Mexican Duck population in the southwestern United States was listed as endangered in 1966. In 1977, however, research indicated that the Mexican Duck population consisted almost entirely of hybrids (Cade 1983). Because the Endangered Species Act does not protect hybrids, the Mexican Duck was removed from federal listing. This example underscores the need to monitor the effect of hybridization on Northern Spotted Owls even though the current incidence appears to be very low.

It will be interesting to monitor the effect of geographical barriers on the range expansion

of Barred Owls in central and southern California. Only one Barred Owl has been sighted in the nonforested valley regions of northern California. The sighting was at Tule Lake outside of the breeding season and apparently was of a transient bird. Because of the lack of sightings in the Central Valley, we hypothesize that the range expansion of Barred Owls will be slower in southern California where forests are isolated by deserts, grasslands, agricultural, and urban areas.

ACKNOWLEDGMENTS

We thank Peter Carlson, Alan Franklin, Armand Gonzales, Tony Hacking, John Hunter, Tom Leskiw, Howard Sakai, David Solis, Richard Tanner, and Brian Woodbridge for providing new sightings and historical information. We also thank two anonymous reviewers and Kimball Garrett for making helpful suggestions. The California Department of Fish and Game (Federal Aid in Wildlife Restoration and California Environmental License Plate Fund), the U.S. Forest Service (contract 53-91S8-6-FW12), and the National Park Service (contract CA 8480-3-9005) provided financial support.

LITERATURE CITED

- BOXALL, P. C., AND P. H. R. STEPNEY. 1982. The distribution and status of the Barred Owl in Alberta. *Canadian Field-Naturalist* 96:46-50.
- CADE, T. J. 1983. Hybridization and gene exchange among birds in relation to conservation. Pages 288-348 in *Genetics and conservation* (C. M. Schonwald-Cox, S. M. Chambers, B. MacBryde, and L. Thomas, Eds.). *Biological Conservation Series*, Benjamin/Cummings Publishing Company, Menlo Park, California.
- CAMPBELL, R. W., N. K. DAWE, I. McTAGGART-COWAN, J. M. COOPER, G. W. KAISER, AND M. E. McNALL. 1990. The birds of British Columbia, vol. II, nonpasserines. Royal British Columbia Museum, Victoria.
- DUNBAR, D. L., B. P. BOOTH, E. D. FORSMAN, A. E. HETHERINGTON, AND D. J. WILSON. 1991. Status of the Spotted Owl, *Strix occidentalis*, and Barred Owl, *Strix varia*, in southwestern British Columbia. *Canadian Field-Naturalist* 105:464-468.
- DUNSTAN, T.C., AND S.D. SAMPLE. 1972. Biology of Barred Owls in Minnesota. *Loon* 44:111-115.
- EVENS, J., AND R. LEVALLEY. 1982. Middle Coast Region. *American Birds* 36:890.
- FRANKLIN, A. B., R. J. GUTIÉRREZ, B. R. NOON, AND J. P. WARD, JR. 1996a. Demographic characteristics and trends of Northern Spotted Owl populations in northwestern California. Pages 83-91 in *Demography of the Northern Spotted Owl* (E.

- D. Forsman, S. DeStefano, M. G. Raphael, and R. J. Gutiérrez, Eds.). *Studies in Avian Biology* No. 17.
- FRANKLIN, A. B., D. R. ANDERSON, E. D. FORSMAN, K. P. BURNHAM, AND F. W. WAGNER. 1996b. Methods for collecting and analyzing demographic data on the Northern Spotted Owl. Pages 12–20 in *Demography of the Northern Spotted Owl* (E. D. Forsman, S. DeStefano, M. G. Raphael, and R. J. Gutiérrez, Eds.). *Studies in Avian Biology* No. 17.
- GILLIGAN, J., M. SMITH, D. ROGERS, AND A. CONTRERAS (Eds.). 1994. *Birds of Oregon: Status and distribution*. Cinclus Publications, McMinnville, Oregon.
- GRANT, J. 1966. The Barred Owl in British Columbia. *Murrelet* 47:39–45.
- GRINNELL, J., AND A. H. MILLER. 1944. The distribution of the birds of California. *Pacific Coast Avifauna* No. 27.
- HAMER, T. E. 1988. Home range size of the Northern Barred Owl and Northern Spotted Owl in western Washington. M. S. thesis, Western Washington University, Bellingham.
- HAMER, T. E., E. D. FORSMAN, A. D. FUCHS, AND M. L. WALTERS. 1994. Hybridization between Barred and Spotted owls. *Auk* 111:487–492.
- HUNTER, J. E., R. J. GUTIÉRREZ, AND A. B. FRANKLIN. 1995. Habitat configuration around Spotted Owl sites in northwestern California. *Condor* 97:684–693.
- JOHNSGARD, P. A. 1988. *North American owls: Biology and natural history*. Smithsonian Institution Press, Washington D.C.
- JOHNSON, D. H. 1992. Spotted Owls, Great Horned Owls, and forest fragmentation in the central Oregon Cascades. M.S. thesis, Oregon State University, Corvallis, Oregon.
- JOHNSON, N. K. 1994. Pioneering and natural expansion of breeding distributions in western North American birds. Pages 27–43 in *A century of avifaunal change in western North America* (J. R. Jehl and N. K. Johnson, Eds.). *Studies in Avian Biology* No. 15.
- JOHNSTON, R. F. 1961. Population movements of birds. *Condor* 63:386–400.
- KNOPF, F. C. 1994. Avian assemblages on altered grasslands. Pages 247–254 in *A century of avifaunal change in western North America* (J. R. Jehl and N. K. Johnson, Eds.). *Studies in Avian Biology* No. 15.
- MORLAN, J. S. F., S. F. BAILEY, AND R. A. ERICKSON. 1987. Middle Pacific Coast Region. *American Birds* 41:322–327.
- NICHOLLS, T. H., AND D. W. WARNER. 1972. Barred Owl habitat use as determined by radio telemetry. *Journal of Wildlife Management* 36:213–224.
- PIELOU, E. C. 1979. *Biogeography*. John Wiley and Sons, New York.
- SHARP, D. U. 1989. Range extension of the Barred Owl in western Washington and first breeding record on the Olympic Peninsula. *Journal of Raptor Research* 23:179–180.
- SHEA, D. S. 1974. Barred Owl records in western Montana. *Condor* 76:222.
- TAYLOR, A. L., AND E. D. FORSMAN. 1976. Recent range extensions of the Barred Owl in western North America, including the first records for Oregon. *Condor* 78:560–561.

Associate Editor: R. L. Hutto