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GREAT GRAY OWLS NESTING IN FRESNO COUNTY, CALIFORNIA

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At two meetings in June 1772 of the Royal Society in London, Johann Reinhold Forster described the specimens of birds, fishes, and mammals that Hudson's Bay Company naturalists had collected and sent to England on their summer 1771 trade ships (Houston et al. 2003). Among them were five birds new to science. Andrew Graham, the factor at Severn River, provided most of these, including a specimen and accompanying notes that enabled Forster (1772) to describe a "fine non-descript [i.e., undescribed] owl," which he named the Grey Owl, *Strix nebulosa*. The other four were the birds we now know as the Eskimo Curlew (*Numenius borealis*), Boreal Chickadee (*Poecile hudsonicus*), Blackpoll Warbler (*Dendroica striata*), and White-crowned Sparrow (*Zonotrichia leucophrys*).

Status and Distribution

Two subspecies of the holarctic Great Gray Owl have long been recognized. *Strix n. lapponica* breeds across Eurasia from northern Scandinavia east through northern Siberia and south to central European Russia, northern Mongolia, northern Manchuria, Amurland, and Sakhalin (Holt et al. 1999). In comparison to *nebulosa* it is slightly smaller in body mass and wing length, slightly paler, and more prominently streaked below (Bull and Duncan 1993).

Nominate *nebulosa* breeds in North America from central Alaska east through the boreal forest of Canada and south locally in the interior to the mountains of north-central Washington, south-central Oregon, California to the southern Sierra Nevada, northern Idaho, western Montana, western Wyoming, southwestern and central Alberta, central Saskatchewan, southern Manitoba, northern Minnesota, northern Wisconsin, northern Michigan (casually), and south-central Ontario (AOU 1998).

Great Gray Owls winter throughout their breeding range in North America, but birds of the central and eastern populations wander south casually as far as Nebraska, Iowa, Indiana, Ohio, Pennsylvania, and New Jersey (AOU 1998). The winter of 2004–05 produced the largest irruption on record. Thousands of birds appeared in Ontario, with 501 found and reported dead (Jones 2005). Daily counts of more than 100 birds were reported as routine in Minnesota in December and January (Granlund 2005). In comparison, fewer than 60 wandering birds were noted in any winter from 1890 through 1965, and the peak irruption reported by Bull and Duncan (1993), in 1991–92, was of fewer than 500 birds. Suggested causes for these southward wanderings include attempts to avoid deep snow cover and shortages of prey in the breeding range (Bull and Duncan 1993).

Early California Records

Newberry (1857) was the first to report the Great Gray Owl in California: "This large and handsome owl is generally disseminated over the western part of the North American continent, at least we obtained proofs of its existence in the Sacramento valley, in the Cascade mountains, in the Des Chutes basin, and on the Columbia, in Oregon." He didn't indicate the nature of these proofs. Baird et al. (1874) mentioned Newberry's report without comment and reported a June specimen from near the mouth of the Columbia River. Apparently on the basis of only those two reports from

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the western United States south of Alaska, they stated, "On the Pacific coast it is resident as far south as the mouth of the Columbia, and is found in winter in Northern California." More specifically, Belding (1890) wrote that "Mr. Wm. Proud has a specimen, which he informed me was brought to him in flesh soon after it had been shot, in the hills near Chico." Belding reported no further details, and the disposition of that specimen is unknown. Grinnell (1914) reported a still extant specimen collected on 26 September 1913, about 10 km south of McCloud, Siskiyou County. In addition to this specimen, Grinnell (1915) cited the reports by Newberry (1857) and Belding (1890) when he reckoned the owl's status as a "rare winter visitant to the north end of the state." Noting the absence of extant specimens that would support the reports of Baird et al. or Belding, and the lack of subsequent records substantiating Newberry's claim from the Sacramento Valley, Winter (1986) judged that these three early California reports are best considered hypothetical.

Grinnell and Miller (1944) summarized records from California, including some apparently unknown to Grinnell in 1915. The earliest specimens they cited were three collected by Edward Garner in the vicinity of Quincy, Plumas County. Bryant (1920) examined one of these, a female taken on 12 May 1894. All that remains of these three specimens is a photograph, showing one mounted specimen, on file in the Plumas County Museum (Winter 1986). Other records cited include a 17 September 1937 specimen from 5 km south of Mt. Ingalls, Plumas County, a male and female—probably a mated pair (Grinnell and Storer 1924)—taken 18 June 1915 near Mono Meadow in Yosemite National Park, Mariposa County, and a specimen collected between Coarsegold and Finegold, Madera County, in May or June 1930 (Abbott 1943).

While researching this paper I located another extant specimen, one that predates by 16 years the 1894 specimen reported by Bryant (1920). Harvard's Museum of Comparative Zoology (MCZ) catalogs an adult male (MCZ specimen number 35407) collected by Ferdinand Gruber on 13 January 1878 in the "Sierra Nevada Mts." of California. Alison Pirie (pers. comm.) reported that MCZ reexamined this mounted specimen five years ago and confirmed its identification and data before returning the specimen to Phillips Andover Academy, which holds it on extended loan. Gruber (1830–1907), was an early California collector, taxidermist, and ornithologist who was curator of the Golden Gate Park Museum in San Francisco at the time of his death (Palmer 1928).

Current Status in California and Oregon

The Great Gray Owl was placed on California's endangered species list in June 1980. In the Department of Fish and Game's first five-year status report on the species Gould (1987) noted that it has suffered from two forms of habitat loss. The zones of mixed conifers and red fir forest, where the majority of owls have been located during their breeding season, had by 1987 experienced well over 100 years of large-scale commercial logging, which had reduced substantially the quantity of mature forest and the number of large trees on which the owl depends for nest sites. Second, long-term overgrazing of montane meadows had reduced their grass cover, lowering the water table and increasing the gulying of watercourses through the meadows. These changes reduced the ability of meadows to sustain voles and pocket gophers, reported by Winter (1986) as the owl's main prey in the Sierra Nevada.

The California Department of Fish and Game continues to classify the species as endangered, meaning that it is in danger of extinction throughout all or a significant portion of its range within the state. A rough estimate of California's current population is approximately 300 birds (K. O'Connor pers. comm.).

In Oregon, the Great Gray Owl is a fairly widespread breeder in the Blue, Cascade, and Siskiyou mountains (Janes 2003). Just north of the state line, the Oregon Breeding Bird Atlas (Adamus et al. 2001) confirmed breeding in seven contiguous hexagonal

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blocks with centers lying roughly along an east–west line between Kerby Peak in Josephine County and Cox Butte in Jackson County. Surveys in the Siskiyou Mountains of southwestern Oregon in 1996 and 1997 found 25 sites where nests, fledglings, or pairs were confirmed. Sixteen of those sites were at atypically low elevations, below 915 m (Fetz et al. 2003). At those low-elevation sites Great Gray Owls inhabit rugged topography where north-facing slopes support mature Douglas-firs (*Pseudotsuga menziesii*) near south-facing slopes with meadows, Oregon white oak (*Quercus garryana*) woodlands, and chaparral. Stewart Janes (pers. comm.) suggests that similar low-elevation habitat in California may also host breeding Great Gray Owls.

California Breeding Records

Grinnell and Storer (1924) reported the earliest evidence of the Great Gray Owl breeding in California—and the first breeding south of Canada known to them—when Grinnell noted a large brood patch on the female he collected in Yosemite National Park, Mariposa County, on 18 June 1915. With well over 100 sight records accepted by Winter (1986), the central Sierra Nevada, especially the Yosemite area, remains the species' center of abundance in California.

The Great Gray Owl has been confirmed nesting at few locations in the Sierra Nevada outside of the Yosemite region. To the north, breeding was confirmed in El Dorado County in 2002, on private land near Plummer Ridge (G. I. Gould, Jr., pers. comm.). Farther north, systematic surveys in Plumas National Forest since 2004 have repeatedly yielded Great Gray Owls near Lake Davis, Plumas County, including near the site of the 1937 specimen. Pairs have been detected, and fledglings believed to be Great Gray Owls have been heard and seen (B. Shaw pers. comm.). But Gary Rotta (pers. comm.) reports that no nest has yet been found. In the California portion of the Sierra Nevada–Cascade range north of Lake Davis, Winter (1986) listed few observations of Great Gray Owls, and Chris Stermer (pers. comm.) reports that there is no firm evidence of breeding. In the Oregon Cascades, the most southerly confirmed nesting found by the Oregon Breeding Bird Atlas was in a block straddling the Jackson/Klamath county line, just west of Upper Klamath Lake (Adamus et al. 2001). That location is about 300 km from Lake Davis.

Fetz et al. (2003) reported sightings of a pair of Great Gray Owls in Siskiyou County about 5 km south of the Oregon line over multiple years. I have been unable, however, to locate any confirmed reports of nesting there or elsewhere in northwestern California.

In 2007 the National Park Service and the U.S. Forest Service embarked on a three-year study to address two questions related to the central Sierra Nevada population of Great Gray Owls (S. Stock pers. comm.). First, is that apparently geographically isolated population genetically different from Great Gray Owls in other parts of North America, and deserving of greater conservation attention? Second, what ecological factors limit the distribution of the central Sierra Nevada population? Blood and feather samples collected in the Yosemite region in 2007 will be compared with those from Oregon and Canada to assess the genetic distinctiveness of the central Sierra population. The second question will be addressed by assessing the current population status and by comparing the habitat at known foraging and nesting sites with sites where the owls are absent, to generate predictive habitat-association models.

South of Yosemite, the first Madera County nest was found in 2002, near Beasore Meadow in the Sierra National Forest (K. O'Connor pers. comm.). Nesting near that location has also been confirmed in several subsequent years (C. Stermer pers. comm.). In Fresno County, nesting was confirmed first in 1998 near Shaver Lake and again there in most subsequent years, including 2007 (S. Byrd pers. comm.; see photo featured on this issue's back cover photo). Farther south, Tulare County's first report of a Great Gray Owl was of one observed at Wolverton Meadow in Sequoia National Park on 23 July 1965 (Winter 1986). The California Natural Diversity Data Base (CNDDB) contains a

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report of nesting near Jackass Creek in the Sequoia National Forest in 1986. A Great Gray Owl was detected there on more than one occasion in 1986, but Steve Anderson (pers. comm.) reports that nesting was not confirmed. Since then, Great Gray Owls have been reported at several other locations in Tulare County, and a juvenile believed to be of this species was seen in mid-August 2007 (G. Lindquist pers. comm.), but no nest has yet been found (S. Anderson pers. comm.). Fresno County remains the most southerly location in the world where a Great Gray Owl nest has been found.

Biologists are interested in gaining a better understanding of the southern extent of the Great Gray Owl's range in the Sierra Nevada. Birders interested in helping to expand knowledge of the species are requested to contact first the biologist for the land management agency responsible for an area of interest. Making such a contact will allow the Forest Service or California Department of Fish and Game to coordinate efforts, avoid excessive disturbance of individual birds, improve the quality and integrity of observations, and ensure the reporting of observation results. For the Sequoia National Forest contact Steve Anderson at (760) 376-3781. He can also direct interested parties to the appropriate biologists with other agencies in the southern Sierra Nevada.

The Photographs

Gary Woods took the photograph on this issue's outside back cover, showing an adult female Great Gray Owl and one of its two nestlings near Shaver Lake, Fresno County, on 1 June 2007. The female has spread its rictal bristles and associated feathers, exposing its entire bill in a mild threat display; compare with its more relaxed facial expression in Figure 1. Woods' photograph on this issue's inside back cover shows both Great Gray Owl nestlings on 1 June. Their grayish facial disks and grayish plumage overall help distinguish them from Great Horned Owl nestlings, whose facial disks and overall plumage are brownish. The nest is about 9 m above the ground in



Figure 1. Adult female Great Gray Owl near its nest, Shaver Lake area, Fresno County, California, 1 June 2007. Note that the tips of the rectrices appear to be broad and fresh.

Photo by Gary Woods

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the top of a broken white fir (*Abies concolor*) snag with an estimated diameter of 66 cm at breast height and 50 cm at the nest. The canopy closure around the nest tree is about 50%. The nest is 200 m from a meadow in which the adult owls sometimes foraged, but the adult male hunted mostly in a larger meadow about 400 m from the nest. The forest that includes the nest tree was extensively logged prior to 1914, so only a small proportion of its trees is now >100 years old. Since 1979 the area around the nest has undergone three episodes of selective single-tree logging. This logging was intended to recreate an uneven-aged forest of mainly yellow and sugar (*Pinus lambertiana*) pines, like the forest prior to European settlement. Great Gray Owls successfully fledged two young from the same nest in 2006, and a juvenile found nearby in 2005 strongly suggests that the same nest was also used then, although the nest could not be located that year (S. Byrd pers. comm.).

The nest's location in a broken snag is typical of the species (Bull and Duncan 1993). Its height is typical of nests studied in southeastern Idaho and northwestern Wyoming, and the nest tree's diameter is typical of snag nests that Franklin (1988) studied there. Its diameter is also similar to that of nest trees Beck and Winter (2000) measured in Stanislaus National Forest but smaller than the 115 cm (at breast height) average they found in Yosemite National Park. The nest's distance from nearby meadows seems consistent with the distances Winter (1986) reported from the Yosemite area. Nest sites are often reused for several years, and in Oregon, Idaho, and California pairs probably remain together as long as both individuals live. Great Gray Owls breed rarely at an age of one year, occasionally at two years, and more commonly at three years (Bull and Duncan 1993).

No reliable way to determine the sex of an adult Great Gray Owl by plumage is known (Pyle 1997). We may safely assume, however, that the adult in these photographs is the female, because only the female broods the nestlings (for 2–3 weeks, beginning immediately after hatching), after which it starts roosting near the nest (Bull and Duncan 1993). Peter Pyle (pers. comm.) notes that this adult displays at least two generations of post-juvinal secondaries (see photograph on back cover) and that the tips of its rectrices (see Figure 1) appear to be both broad and fresh, indicating that it is at least three years old and probably at least four years old. The older estimate is supported by known or suspected nesting probably by the same female in two preceding years.

One of the two nestlings at Shaver Lake left its nest on the windy night of 5 June 2007; its sibling was still in the nest the next day. On 8 June, Woods photographed one fledgling on the ground (see Figure 2), while the other called softly and unseen from ferns nearby. One fledgling was seen regularly around the nest over the next three weeks, including in the canopy near the nest tree on 14 June. A single fledgling was last observed several hundred meters away during the first week of September (S. Byrd, G. Woods pers. comm.).

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Figure 2. Fledgling Great Gray Owl near its nest, Shaver Lake area, Fresno County, California, 8 June 2007.

Photo by Gary Woods

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