

## BREEDING OF THE SHORT-EARED OWL IN NEW MEXICO

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**ABSTRACT:** We report four instances of breeding by the Short-eared Owl (*Asio flammeus*) in three areas of New Mexico in 2014, the first confirmed breeding for the state and southernmost known for interior North America. A nest and two pre-fledged juveniles plus a family group were at two sites in Otero County, a pair with one pre-fledged juvenile was found in Luna County, and a family group was observed in Roosevelt County. Each area had received substantial precipitation in September 2013, resulting in increased vegetative cover and growth of annual plants, presumably increasing small mammal prey for owls. Regurgitated pellets collected from the Otero County sites revealed that the Short-eared Owls preyed mainly on heteromyid rodents. Breeding should be considered possible for birds detected in March and later in areas south of the normal range when conditions are favorable.

In North America, the Short-eared Owl (*Asio flammeus*) breeds across the continent from the low Arctic, including southern Alaska, south to roughly 40° north latitude in the western states of Nevada, Utah, Colorado, and Kansas (AOU 1998, Wiggins et al. 2006). Historically, it nested in suitable habitat along the entire California coast, but in recent years it has bred consistently only in the central and northern regions of the state (Grinnell and Miller 1944, Garrett and Dunn 1981, Wiggins et al. 2006, Roberson 2008). On the east coast, the Short-eared Owl breeds from the northern portions of the Canadian provinces south to northern Virginia (AOU 1998). In interior states, instances of Short-eared Owls nesting south of the species' usual limit have been reported in southern Colorado (Boyle 1998), northern Oklahoma (Nice 1931, Blaha et al. 1995, Wilson 1995), and Kentucky (Stamm and Clay 1989).

The Short-eared Owl is a partial migrant, withdrawing from the northern portion of its range to winter farther south. It winters from southernmost Canada south through the U.S. into northern Mexico, and less commonly as far south as Oaxaca and the Yucatan Peninsula in southern Mexico (Enriquez-Rocha et al. 1993, Howell and Webb 1995, AOU 1998). The Short-eared Owl moves nomadically, responding to fluctuations in its prey such that its distribution and abundance can vary greatly from season to season anywhere in its range, including occasional extralimital breeding (Clark 1975, Poulin et al. 2001, Wiggins 2004, Wiggins et al. 2006, Booms et al. 2014).

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### STATUS IN NEW MEXICO

In New Mexico, the Short-eared Owl is considered an uncommon migrant and winter resident statewide with numbers and distribution varying from year to year (Hubbard 1978, Avery and Keller 2010). It is usually associated with open habitats, particularly open grasslands and wetlands, but it also occurs in shrublands and stands of trees (Ligon 1961, Wiggins 2004, Avery and Keller 2010). In the southern part of the state from November to March, Short-eared Owls use lowland desert swales and basins vegetated primarily with dense grasses including Tobosa (*Pleuraphis mutica*) and Alkali Sacaton (*Sporobolus airoides*) (Meyer pers. obs.).

Despite circumstantial evidence, Short-eared Owl breeding has not been confirmed previously in New Mexico. Such evidence was first reported from eastern New Mexico in 2005 (Avery and Keller 2006; Figure 1), on the basis of a suspected pair noted by multiple observers 14.5 km west of Portales in northern Roosevelt County from May to August. Though the birds' pro-

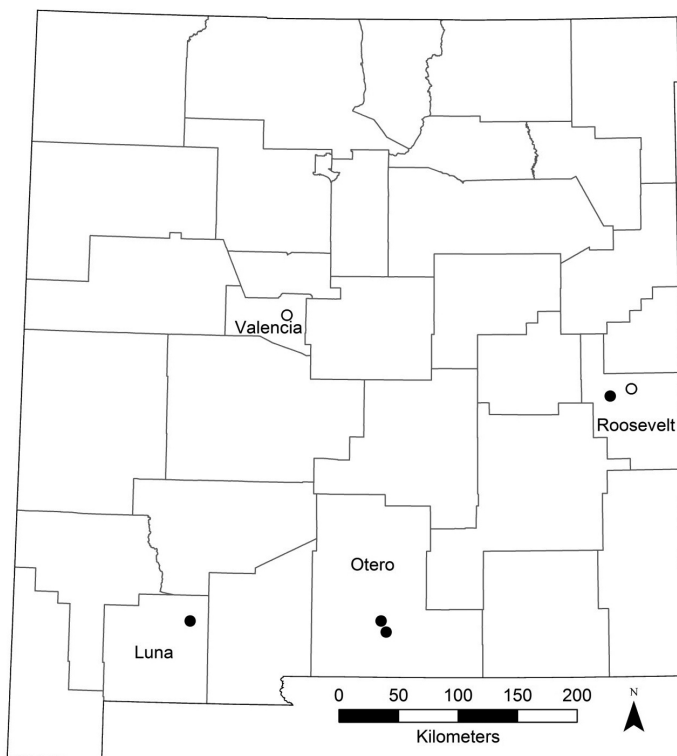


Figure 1. Locations of Short-eared Owl breeding in Roosevelt, Otero, and Luna counties, New Mexico, in 2014 (solid circles) and likely breeding in Roosevelt County in 2005 and Valencia County in 2007 (open circles).

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longed stay in presumably suitable habitat during the breeding season, and their territorial and aggressive behavior, suggested they were breeding, no nest or young were witnessed. A second instance involved up to 12 birds, possibly including a family group, in grasslands of central New Mexico near Tome, Valencia County, from June to July in 2007 (*N. Am. Birds* 61:621, 2008; Figure 1). In addition, Short-eared Owls were observed with no suggestion of nesting on at least five occasions in summer from 2000 to 2009 in Colfax (*N. Am. Birds* 59:634, 2006), Harding (*N. Am. Birds* 55:468, 2001), Curry (*N. Am. Birds* 54:409, 2000; 63:631, 2010), and Hidalgo (*N. Am. Birds* 61:621, 2008) counties in eastern and southern New Mexico.

### Breeding in 2014

In 2014, breeding by Short-eared Owls was documented in two areas of south-central New Mexico and at another site in eastern New Mexico (Figure 1). On Otero Mesa in central Otero County, Meyer observed two breeding pairs approximately 10 km apart from late May to early June. At one of the sites, the nest, two young, and two adults were observed. At the second location, two juveniles and two adults were seen but a nest was not found. During the same period, Meliopoulos observed one young bird and two adults farther west near Nutt in northeastern Luna County. In eastern New Mexico, Beauprez saw up to six birds, presumably a family group, southwest of Floyd in northern Roosevelt County from late May to early July.

### Otero County: Cocklebur Tank

On 28 May 2014, Meyer encountered a pair of owls aggressively defending an area on the Otero Mesa portion of the McGregor Range of Fort Bliss. One of the adult owls stooped on him several times, emitting loud alarm calls, while the other bird remained in flight at a distance. A search of the area resulted in the discovery of a nest and, nearby, an owlet approximately 12 days old (32.348° N, 105.711° W, elevation 1508 m). The McGregor Range includes the northwestern corner of Otero Mesa bounded to the north by the foothills of the Sacramento Mountains and to the west by the Tularosa Basin. In this portion of the range military activity is limited but modest numbers of livestock graze. Roads are mostly unmaintained and used infrequently.

The nest was a simple scrape with minimal lining of plant material and feathers. It was located on the northern perimeter of a small, shallow basin adjacent to the earthen Cocklebur Tank. Surrounding the nest was a dense canopy of vegetation, primarily Russian Thistle (*Kali tragus*) with some gumweed (*Grindelia* sp.), remaining from the previous growing season. Grass cover was sparse, primarily Vine Mesquite (*Hopia obtusa*). The accumulated Russian Thistle formed a ring about 25 m wide and 0.6 m high around the northern edge of the basin. Much of the basin's bottom was vegetated with dense cocklebur (*Xanthium* sp.). Surrounding the basin was homogeneous plains-mesa grassland with widely scattered Soap-tree Yuccas (*Yucca elata*) and shrubs on gently sloped terrain (Mehlhop et al. 1996).

On 3 June, two adults and two young were in a small group of shrubs (*Condalia ericoides*) about 120 m northwest of the nest (Figure 2). The

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young birds appeared incapable of flight and presumably had moved from the nest on foot. On 20 June, no Short-eared Owls were detected in the area.

### Otero County: Godfrey Tank

On 22 May 2014, Meyer observed a Short-eared Owl landing at a large mat of Russian Thistle southwest of Godfrey Tank, in a broad, rather flat swale known as El Paso Draw, about 10 km north-northwest of Cocklebur Tank. He initially presumed the owl to be a late migrant, but after finding the nest at Cocklebur Tank, he revisited Godfrey Tank on 28 May. No owls were detected in the immediate vicinity of the 22 May sighting, but two adults and an apparent juvenile were encountered roughly 650 m to the north (32.432° N, 105.757° W, elevation 1469 m), within 100 m of each other roosting under small Soap-tree Yuccas. After being flushed, one adult flew overhead briefly emitting alarm calls, while the other bird flew a short distance to another yucca. In a later visit to the site on 3 June, four birds were observed in close proximity to each other, roosting under yuccas about 165 m east of the 28 May location. After being flushed, two of the birds flew a few hundred meters to the east while the other two birds, roosting under one yucca, flew a short distance before landing. The behavior, slightly different appearance, and down and feathers found at their roost site suggested that the two latter birds were juveniles.

At this site, the dominant woody vegetation was short (height mostly <2 m) Soap-tree Yucca and Sand Sagebrush (*Artemisia filifolia*). Grass cover was sparse, primarily dropseeds (*Sporobolus* spp.), forbs were numerous, and the soil was sandy. Small clusters of dead Russian Thistle had built up around woody plants and in depressions throughout the area. Roost sites also were found in dense accumulations of Russian Thistle along a nearby fence. Two hours of searching in the roosting area or in the adjacent draw failed to reveal a nest.

Nine pellets collected at the Cocklebur Tank nest, possibly those of nestlings, were uniform in size and contained partial skulls and lower mandibles of 23 pocket mice, likely the Silky Pocket Mouse (*Perognathus flavus*) on the basis of morphological characteristics, geographic location, and habitat (Clary et al. 1999, Dalquest and Stangl 1986). More than 10 castings collected at the daytime roost near Godfrey Tank were more variable in composition, containing primarily pocket mice (30), but also five kangaroo rats (*Dipodomys* sp.), two unidentified heteromyids, a gopher (Geomysidae), and an unidentified bird.

### Luna County: Nutt Grasslands

On 1 June 2014, Meliopoulos observed a Short-eared Owl in flight during a breeding bird survey on the Nutt grasslands. Investigation after the bird landed revealed a second adult and one owlet, all roosting under separate Soap-tree Yuccas within 15 m of each other (32.568° N, 107.465° W, elevation 1435 m; Figure 3). The young owl appeared to be nearly fledged, being fully feathered with a black face, well-developed ear tufts, and an unstreaked

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buffy breast and belly. On 4 June, a search within a radius of 100 m of the detection site yielded neither the young nor adult owls, only down feathers and two pellets under Soap-tree Yuccas within 60 m of the owlet's location. The Soap-tree Yuccas used by the owls ranged from 1 to 1.3 m in height.

The Nutt grasslands are dominated by Tobosa grass with scattered forbs, Soap-tree Yuccas, and Longleaf Ephedra (*Ephedra trifurca*). The owls were in an area of dense Tobosa and small clusters of widely spaced yuccas with nearby fences lined with dense Russian Thistle. The Nutt grasslands are considered one of the few remaining tracts of relatively intact desert grassland, though a 769-ha wind farm was installed there in 2011, as well as a 202-ha solar facility in 2013. The owls were located 987 m from the solar facility, 3.43 km from the nearest wind turbine, and 219 m from New Mexico Highway 26.

### Roosevelt County: Southwest of Floyd

On 29 May 2014 during the Floyd Breeding Bird Survey, L. F. Neely observed a Short-eared Owl 13.4 km southwest of Floyd in northern Roosevelt County. During a visit to the same area on 14 June, Beauprez did not see owls at the original detection site but flushed three, suspected to be two adults and a fledgling, while driving approximately 560 m to the north (32.412° N, 103.684° W, elevation 1338 m). The owls flushed from the roadside where dense Russian Thistle had accumulated along a fence line. On 26 June Beauprez observed six owls along the same road about 120 m south of the 14 June location. In a final visit to the site on 8 July he flushed four Short-eared Owls. Roosevelt County lies at the western edge of the shortgrass steppe region of the Great Plains. The vegetation at the site was primarily native short/mixed grassland, minimally disturbed, dominated by grama (*Bouteloua* spp.), with widely scattered Sand Sagebrush.

No direct evidence of Short-eared Owl nesting was observed at the Floyd site, but the photographs of four individuals taken on 14 June suggested that two, if not all, were juveniles (D. Wiggins, D. Holt, pers. comm.). Two showed the dark facial disks typical of young birds. The plumage of all four was richly colored and unworn, suggesting that all were hatch-year birds. In addition, it is unlikely that more than two adults would occur during the breeding season in such close proximity or that adults would be attending young as late as July.

### Chronology

Short-eared Owls begin breeding in February, and most nest from April to mid June (Wiggins et al. 2006). At the New Mexico sites, the early stages of breeding, including pair establishment, probably occurred in March. For nests on Otero Mesa and the Nutt grasslands, we estimate the clutches were completed between 25 March and 18 April, hatching from 24 April to 16 May, and fledging from 25 May to 16 June, on the basis of known intervals for stages of the nest cycle (Wiggins et al. 2006).

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### DISCUSSION

The Short-eared Owl observations in 2014 represent the first confirmed breeding for this species in New Mexico and the most southerly documented for interior North America, approximately 300–500 km beyond the southernmost known interior breeding sites in northern Oklahoma and southern Colorado. Nevertheless, the Short-eared Owl may breed widely, albeit infrequently, south of its normal range. Given previous reports of suspected breeding and periodically favorable conditions, it likely did so in New Mexico prior to 2014 (see Avery and Keller 2006, 2010). For example, a widespread rodent irruption, the result of a wet monsoon season in 2006, prompted unusual nesting in 2007 by raptors including the Long-eared Owl (*Asio otus*) and Northern Harrier (*Circus cyaneus*) at multiple lowland locations across the state (*N. Am. Birds* 61:489, 2007; 61:621, 2008). The winter–spring season of 2007 produced an unprecedented number of Short-eared Owl sightings in New Mexico (Williams unpubl. data) and the apparent family group in Valencia County. Occasional summer sightings also have been reported from coastal and inland Texas where breeding was not suspected but possible (*N. Am. Birds* 57:516, 2004; 59:622, 2006), including sites south of the New Mexico breeding localities (M. W. Lockwood pers. comm.).

The locations of New Mexico breeding in 2014, spanning a distance of 390 km and two ecoregions, shared common habitat features. All areas consisted of relatively flat, extensive grasslands, open or with sparse shrubs, although the cover and composition of grass varied. Apart from infrequent traffic on roads, there was little human activity near the sites. Dense accumulations of Russian Thistle, used in concealment at the Cocklebur Tank nest, also was potential nesting habitat at the other three sites. Use of such thickets was more likely at the Godfrey Tank and the Floyd sites where other habitat suitable for nesting was limited. Tall, dense tobosa grassland, similar in structure to nesting habitat farther north, was a viable option in Luna County. In addition to cover, Russian Thistle provides a food source for rodent prey (Forbes 1962, Schmidly 2004, Longland 2007).

Breeding of the Short-eared Owl has been closely linked to the abundance of small mammals (Bent 1938, Pitelka et al. 1955, Clark 1975). In arid regions, the growth of vegetation, particularly annual plants, induced by rain stimulates rodents' reproduction and rapid population growth (Brown and Heske 1990, Ernest et al. 2000, Lightfoot et al. 2012). The areas where the Short-eared Owls nested received rainfall well above average late in the 2013 growing season, following a period of severe drought. In September 2013, 12.6 cm fell at the Remote Automated Weather Station on Otero Mesa; 7.6–17.6 cm fell at stations around Nutt, and 15.1 cm was recorded at the Melrose Range station northwest of Floyd ([www.wrcc.dri.edu/raws.dri.edu/index.html](http://www.wrcc.dri.edu/raws.dri.edu/index.html)).

Breeding Short-eared Owls prey primarily on small mammals, particularly voles (Wiggins et al. 2006, Booms et al. 2014). South of the breeding range, wintering Short-eared Owls rely on other prey, and their diet may be more varied (Valdez-Gómez et al. 2009, Williford et al. 2011). The pellets collected on Otero Mesa in 2014 suggested that the owls preyed heavily on small heteromyids. Pocket mice (*Chaetodipus* spp., *Perognathus* spp.) and Ord's Kangaroo Rat (*Dipodomys ordii*) have high reproductive rates and

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Figure 2. One of two pre-fledged Short-eared Owls roosting under a shrub (*Condalia ericoides*) about 120 m from the nest on Otero Mesa, Otero County, New Mexico, 3 June 2014.

*Photo by Raymond A. Meyer*



Figure 3. Pre-fledged Short-eared Owl in tobosa grassland west of Nutt, Luna County, New Mexico, 1 June 2014.

*Photo by DeeAnne T. Meliopoulos*

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are active year round (Brown and Zeng 1989, Thibault and Brown 2008, Lightfoot et al. 2012). At Fort Bliss, Clary et al. (1999) found the Silky Pocket Mouse (*Perognathus flavus*) was the most abundant rodent and the one most frequently captured in yucca grassland and open grama grassland. While increased numbers of rodents likely contributed to the Short-eared Owl breeding on Otero Mesa, the low total biomass of the small-mammal community dominated by diminutive pocket mice (weight 6–10 g) may have resulted in owl broods smaller than in areas with larger, more typical prey, where clutch sizes are as high as 11 (Clark 1975, Wiggins et al. 2006).

These cases of breeding far south of its usual breeding range demonstrate the Short-eared Owl's tendency to nomadism and opportunism (Stone et al. 1994, Figueroa-R. et al. 2009, Valdez-Gómez et al. 2009, Williford et al. 2011). The species' nesting is difficult to confirm because of its nocturnal habits, selection of remote areas, reluctance of adults to leave nests, and resorting to defensive behavior only when a threat is very near a nest or young (Wiggins et al. 2006). Nevertheless, in suitable habitat during the potential breeding season (mid-February–August), observers should be alert for Short-eared Owl breeding activity after ample rain elicits abundant growth of grasses and forbs and elevated densities of small mammals.

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