years during 2010–2012 and confirmed that eagle visitation to active rookeries was common, but did not provide evidence of eagles predating on eggs or carrying them in their talons (S. Windels unpubl. data). Systematic searches of the nest surface and a 15-m radius around the base of nest trees conducted on 20–25 occupied Bald Eagle nests annually from 2009–2012 throughout the rest of VNP did not document cormorant or gull eggs near eagle nest sites (S. Windels unpubl. data). Combined, evidence from nest searches and digital game cameras suggests that though Bald Eagle visitation to active rookeries of colonial waterbirds is common in our area, the egg predation behavior by Bald Eagles we observed appears much rarer. Most adult Bald Eagles in the area were not banded; thus, we did not know the relationships between the breeding pairs observed at Nests 209 and 266 in 2011, or with the immature eagles observed in the same areas in 2011 and 2012. We speculate that the egg predation behavior we observed is a learned behavior specific to Bald Eagles at this particular site.

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EXCEPTIONALLY LARGE CLUTCHES IN TWO RAPTORS BREEDING IN NEST BOXES

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In birds, clutch size can be affected by many factors. These factors include territory quality, food availability, predation pressure, parasitism, competition for nesting sites, nest size, age, and body condition of breeding birds, and finally, by various abiotic factors (Lack 1954, Högstedt 1980, Korpimäki 1985, Martin et al. 2000).

The Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) is a small owl that breeds from southern U.S.A., mainly Texas and Arizona, south to the center of Argentina (Holt et al. 1999). In such a large range, it inhabits tropical, subtropical, and semiarid forests, as well as areas with pastures and shrubs. In Argentina the species occupies diverse wooded areas, from small groves to large forests (Narosky and Yzurieta 2003). It is considered a generalist predator, feeding mostly on insects and small vertebrates (Holt et al. 1999, Proudfoot and Johnson 2000, Sarasola and Santillán 2014). One review reported a mean clutch size of 3.3 eggs and a range of 2–5 eggs in 43 nests, although with no geographic location (Holt et al. 1999). In North America, Proudfoot and Johnson (2000) found an average clutch size of 4.9 (range 3–7 eggs, $n = 58$ nests) in Texas. In Arizona and Mexico, mean clutch size was 4.2 eggs (range 2–6 eggs, $n = 229$ nests) and most nests produced four young (range = 1–5 young, $n = 186$ nests) in natural cavities (Flesch 2007). In South America, information on this species' breeding biology is scarce. König and Weick (2008) mention clutch sizes ranging from three to five eggs. In the dry Chaco of Argentina, clutch size in two nests averaged five eggs and brood size was 3.3 nestlings per nest ($n = 2$ nests, Carrera et al. 2008). De La Peña (2010) reports a clutch size of five eggs, with four nestlings per nest in three nests in the Espinal.

The American Kestrel (*Falco sparverius*) is a small falcon widely distributed in America from Alaska and Canada in the north to Tierra del Fuego and Islas Malvinas (Falkland Islands) in the south. It inhabits most natural and modified environments through the continent as long as they contain some open areas; it is not present in heavily forested areas, the tundra, and some areas of the Amazon basin and coastal Brazil (del Hoyo et al. 1994, Ferguson-Lees and Christie 2001, Smallwood and Bird 2002). In Argentina, it occurs throughout the country, occupying almost all ecosystems, being especially abundant in agricultural areas and other open areas (Donázar et al. 1993, De la Peña and Rumboll 1998, Narosky and Yzurieta 2003). An opportunist-generalist predator, the kestrel feeds on insects and small vertebrates (Ferguson-Lees and Christie 2001, Smallwood and Bird 2002, Sarasola et al. 2003, Liébana et al. 2009). Its breeding biology has been extensively investigated in North America using both natural nests and nest boxes (Smallwood and Bird 2002), but little studied in South America (Balgooyen 1989, De Lucca and Saggese 1993, Sarasola et al. 2003, Liébana 2008, Santillán et al. 2009, Liébana et al. 2013). In the northern hemisphere, where several large-scale long-term studies have been conducted, clutch sizes usually range from four to six eggs, with rare extreme ranges of 1–7 and a single record of eight eggs that was discounted because it was presumed to be the product of two females (Bird and Palmer 1988, Smallwood and Bird 2002). As an example, Wiebe and Bortolotti (1995) studied 1124 clutches during 3 yr in Saskatchewan and found only 48 clutches of six eggs (4.3%) and none of seven or eight. In Venezuela, mean clutch size was 3.7 eggs (range of 2–5 eggs, $n = 12$ nests, Balgooyen 1989). In Patagonia, De Lucca and Saggese (1993) found 3.2 nestlings per nest ($n = 6$ nests), whereas in our study area, the semiarid forests of central Argentina, Liébana (2008) reported a mean clutch size of 4.3 eggs (range 2–5 eggs) and a reproductive rate of 2.7 nestlings per nest (range 2–5 nestlings, $n = 6$ nests). We here present records of exceptionally large clutches in 2014 for the American Kestrel and the Ferruginous Pygmy-Owl, both breeding in nest boxes in central Argentina.

In 1998, we installed 10 nest boxes for American Kestrels in Parque Luro Natural Reserve, a remnant of semiarid forest of Caldén (*Prosopis caldenia*) located 35 km south of Santa Rosa, La Pampa province, in central Argentina. The following year, 40 additional boxes were put up in the reserve (Liébana 2008, Liébana et al. 2013). Since then, between 13 and 50 nest boxes have been monitored annually in the reserve, except in 2004–2005 and 2007–2009. In 2011, another 50 boxes were put up on power poles in an agricultural area between the towns of Anguil, Colonia Barón, and Winifreda, approximately at 30–70 km north-northeast of Santa Rosa, La Pampa. The area is characterized by a rotation of crops and cattle in a matrix of croplands and pastures, with small fragments of Caldén forest. In 2012, another 30 boxes were put up on power poles in a more intensively farmed area, mostly devoted to soybean production, close to the towns of Intendente Alvear and Ojeda in northwestern La Pampa province, at approximately 180–190 km from Santa Rosa (Table 1). These newer sets of boxes have been monitored annually since they were put up. All nest boxes were constructed approximately following the design of Bortolotti (1994), although with a larger entrance hole (ca. 9 cm in diameter), as we initially expected that they might also be occupied by the Spot-winged Falconet (*Spiziapteryx circumcincta*). The breeding season in our study area (from egg-laying to fledging) began in late October and ended in late December–early January (Liébana et al. 2009). In each year, we monitored the boxes regularly every week until the clutch was complete and then not again until near the presumed hatching date. We considered a box occupied if we observed breeding behavior such as a copulation near the box or a prey delivery by the male to the female, if we found a nest cup within the box and saw the adults near the box, or if we found adults, eggs, or fledglings inside the box during the breeding season.

Since 2011, a high percentage of boxes were occupied by American Kestrels in agricultural lands (from 66% [33 of 50] in 2011 to 97.5% [78 of 80] in 2014), whereas

Table 1. Nest-box availability and occupancy by American Kestrels and Ferruginous Pygmy-Owls in a semiarid forest and agricultural land in La Pampa Province, central Argentina from 1998 to 2014. Data for the semiarid forest from 1998 to 2010 taken from Liébana et al. (2013).

HABITAT	NO. OF NEST BOXES	YEAR											
		1998	1999	2000	2001	2002	2003	2006	2010	2011	2012	2013	2014
Semiarid forest	No. available nest boxes	10	50	42	42	42	42	13	19	24	24	24	24
	No. occupied by American Kestrels	2	7	7	8	8	5	6	6	4	6	6	12
	No. occupied by Ferruginous Pygmy-Owls	0	0	0	0	2	3	0	0	0	0	0	1
Agricultural lands	No. available nest boxes									50	80	80	80
	No. occupied by American Kestrels									33	74	73	78
	No. occupied by Ferruginous Pygmy-Owls									0	0	0	0

the percentage in Parque Luro Natural Reserve has typically been <25%, although in the 2014 season, it was of 50% (Table 1). Ferruginous Pygmy-Owls rarely used the nest boxes, occupying them only in 3 yr of 12, no more than 7.1% of the boxes in any single year, and only in Parque Luro Natural Reserve. In the 2014 breeding season, one of the boxes in Parque Luro Natural Reserve was occupied by Ferruginous Pygmy-Owls (Table 1). This pair produced an exceptional clutch of seven eggs (to our knowledge the largest clutch ever recorded for the species in South America, Fig. 1), from which six nestlings hatched. Although the information on clutch or brood size for the species in South America is scarce, there are no records of even a six-egg clutch, suggesting that this clutch was indeed a rare event. In the northern hemisphere, Proudfoot and Johnson (2000) reported a range of 3–7 eggs, indicating that there was at least one seven-egg clutch among 58 monitored nests. However, Flesch (2007) did not record any seven-egg clutches among 229 nests in Arizona and Mexico, suggesting again that the clutch size we found in Parque Luro Natural Reserve represents a rare event.

Figure 1. Seven-egg clutch of Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) in a nest box in Parque Luro Natural Reserve in the 2014 breeding season, La Pampa, Argentina.

In the same 2014 breeding season, we also recorded unusually large clutches for American Kestrels, with six clutches of six eggs, and three clutches of seven eggs among 88 recorded clutches. Eight eggs were found in another box, although they apparently resulted from two separate laying episodes: on the first visit on 30 October 2014, we found five eggs and 19 d later there were eight eggs in the box. On subsequent visits, the number of eggs was reduced to three. Two young hatched and fledged, but their hatching date indicated that the eggs were laid around 16 November 2014, 16 d after our first visit. This suggests there were two laying episodes, the first producing 5–6 eggs and the second, at least 15 d later yielding 2–3 eggs. We don't know whether clutches belonged to one or two different females; however, the female in this box was particularly defensive and we observed no differences in its attack intensity throughout the season, suggesting that it was the same individual. Although there was a progressive reduction in the number of eggs present in the box, the eight eggs were perfectly ordered in the box when we found them on our second visit on 19 November, as if they were all being properly incubated (Fig. 2). In all the remaining large clutches, eggs hatched when predicted according to the laying dates.

No more than six nestlings hatched in any of the exceptional clutches, which might be expected, as American Kestrels only rarely are able to raise six fledglings and seem to have difficulties properly covering large clutches (Bortolotti

Figure 2. Seven- and eight-egg clutches of American Kestrels (*Falco sparverius*) in two nest boxes in agricultural lands in the 2014 breeding season, La Pampa, Argentina.

and Wiebe 1993, Wiebe and Bortolotti 1995). For American Kestrels, six-egg clutches in our study area, although rare, were found in some previous years. One such clutch was recorded in each of 2001, 2002, 2003 (Liébana pers. comm.), and 2011 breeding seasons, two were recorded in 2013, and none in the remaining years. In our study area, there were no previous records of seven or eight eggs in a box in the past, and records of clutches of six or more eggs are rare elsewhere (Bird and Palmer 1988, Wiebe and Bortolotti 1995, Smallwood and Bird 2002). Our results, even considering that the number of occupied boxes in the early years was low (2–6; Table 1), suggest that in our study area a relatively high percentage of pairs can have unusually large clutches in certain years: ca. 12% in 2001 and 2002, 20% in 2003 and 10% (with a much larger sample size) in 2014.

Clutch size is related to latitude, with larger clutches farther from the equator. Larger females and spacious nest boxes are also correlated with larger clutches (Lack 1954, Korpimäki 1985). In previous seasons, breeding parameters in our study area were similar to those reported in other areas, at least in the case of American Kestrels for which there is more information (Bird and Palmer 1988, Smallwood and Bird 2002, Liébana 2008, Liébana et al. 2013). Therefore, the high frequency of unusually large clutches we report for 2014 (and some previous years in the case of the American Kestrel) are probably the result of exceptionally good years in food resources for these two species, or at least the result of the birds' perception of the year as exceptionally good. Long-term monitoring of larger samples of pairs in coming years will eventually allow us to analyze potential sources of variation in breeding success and assess environmental factors supporting the unusually large clutches reported in this study.

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