

SHORT COMMUNICATIONS

General Biology

ORNITOLOGIA NEOTROPICAL 10: 211–215, 1999
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NESTING OBSERVATIONS OF THE YELLOW-HEADED CARACARA IN THE CERRADO REGION OF BRAZIL

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Key words: Yellow-beaded Caracara, *Milvago chimachima*, breeding, nest, cerrado, Brazil.

INTRODUCTION

Although the Yellow-headed Caracara (*Milvago chimachima*) is widely distributed, common birds in South America, little is known concerning their breeding biology. Bierregaard (in del Hoyo *et al.* 1994) conducted an excellent review of known data, but details are based on fragmented observations, are incomplete, and often inferential (Mader 1981, del Hoyo *et al.* 1994). It is known that Yellow-headed Caracaras typically lay 1–2 eggs per nest, and they use of stick nests, as well as hills (termite mounds?), as nesting sites (del Hoyo *et al.* 1994). While information on nest placement and structure is well known (greater than 15 reported), information on the breeding behavior to be almost completely unknown (Bierregaard 1995).

Our observations of nesting pairs (or a single pair repeatedly) of Yellow-headed

Caracaras over a period of six breeding seasons indicate that, at least near the center of its distribution, and in the ranch setting where we observed them, Yellow-headed Caracaras always lay four eggs (previously reported as 1–2). We are also able to report previously unknown incubation and fledging rates, as well as to add to prey and food items utilized by Yellow-headed Caracaras. It is especially interesting to note that, while the nests themselves are considered to be fairly well known (Bierregaard 1995), we were able to observe previously unreported nest data.

STUDY AREA AND METHODS

The cerrado region (located primarily in central Brazil) is the second largest biome in South America. This region encompasses an area about 1.6 million km², or one half the size of Amazonia (Ab'Saber 1977, Furley & Ratter 1988). The vegetation types of the cerrado region range from grassland (campo) to dense savannah (cerradão). Gallery forests (mata galeria) occur in narrow bands along

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rivers and streams, and dry forests (mata mesofítica) occur in widely scattered small and medium patches where soil conditions are appropriate. It is these bands and patches of forest that are thought to be the critical element for the survival of many bird species in the cerrado (da Silva 1995). Unfortunately the natural vegetation of the cerrado has been badly fragmented by agricultural practices, including induced fire, which has resulted in a 45% reduction in undisturbed cerrado habitat in the past five years (N.G. da Silva Jr., pers. comm.)

All observations of breeding Yellow-headed Caracaras were recorded at a ranch located 43 km east of Caldas Novas, Goiás, Brazil (17°45'S, 48°35'W). This 3300 ha ranch has been returned (as much as possible) to pristine cerrado vegetation, while the surrounding landscape has been extensively altered by fire and agriculture. During each breeding season, between 1992 and 1998, pairs were observed several times daily (from two to five times per day). Once a nest was discovered it was visited briefly every day until the fledging of the young. Observations (dates, numbers, locations, behavioral traits etc) were recorded in daily journals.

OBSERVATIONS AND RESULTS

On 4 August 1992, a pair of Yellow-headed Caracara established a nest in a square plastic bucket, ½ full of ground corn, with an opening 20 cm on each side and a depth of 25 cm. The bucket was attached to the wall of the ranch house (1.6 m. above ground) on the house's inner court. There was no evidence of the nest building with sticks or other material, but ground corn was used as the nesting substrate. The first three eggs of a clutch of four were laid on consecutive days (4, 5, and 6 August) before skipping a day between the 3rd and 4th egg. Incubation began only after the fourth egg was laid. Incubation lasted for 22

days and all four eggs hatched synchronously on 30 August. Fledging time for each young varied slightly (17–20 days), with the first leaving the nest on 16 September, the next two on the 17th, and the last leaving on the 19th. The fledglings remained in the area throughout the next few months and were fed by both adults for approximately three weeks after fledging. We observed fledglings being fed ($n = 19$), with various beetles, grasshoppers and crickets making up about 90% of the food items being delivered, with an occasional lizard also being provided by the adults. On 31 July 1993, we found adults nesting in an empty 5-l oil can hanging on the inside wall of the second story of the ranch's water tower. Two eggs were already in the can and the next two followed on consecutive days. Eggs were deposited on the can's bare aluminum bottom. Incubation was again delayed until all four eggs were present. All young hatched on 24 August, with two fledging on 10 September and two the following day (again 17–19 days).

During the breeding season of 1994, no nest was located, but adult Yellow-headed Caracaras were observed in the same area. Young were never observed and we surmise that either egg laying never took place or the nest was depredated or otherwise lost.

In August 1995, Yellow-headed Caracaras nested in a wooden box originally constructed to attract snakes. The box was 35 cm. long, 25 cm. wide and 10 cm. tall, and open on the top (25 x 35 cm.) The wooden box attached to the side of the ranch house, 1.75 m. above the ground, just outside the kitchen window in an area of frequent human disturbance. The eggs were laid on consecutive days from 4–7 August, and were deposited on the bare wood of the box. Incubation began after the 4th egg was laid, and all four eggs hatched on 29 August. One of the four young appeared to be a "runt" throughout its development. Despite their size differences, all four young

fledged 17 days after hatching (15 September).

In 1996 a pair of Yellow-headed Caracaras were observed flying into and out of an excavated cavity about 10 meters above the ground in a tree, about 120 meters from the farmhouse. The cavity had been excavated and used as a nesting site the previous two years by toucans. While the nest site was inaccessible for direct observation we witnessed considerable activity in and around the nest site throughout August, and two recently fledged young were observed in the first week of September.

A pair of Yellow-headed Caracaras was observed using the same tree cavity in 1997, but no young were found. We did witness what we interpret as food begging by the female. While calling to the male, she bowed her head, extended her wings behind her body, and rapidly fluttered her wings. We believe this is a pairbonding and mating ritual, but were unable to remain on site to observe the selection of a nest or production of young. Food begging has been observed in subsequent breeding seasons as well (unpubl. data).

The female was always the primary incubator at the nest. She was occasionally (one or two times per day) relieved by the male who would call her off the nest. She would fly to the calling male, who in turn flew into the nest and settled on the eggs. The female would return a short time later (usually 5 to 10 min) and incubating duties would again be switched. We observed this behavior on a daily basis (during incubation) and were typically alerted to the event by the calling of the male.

DISCUSSION

Several things we have observed over a period of six breeding seasons appear to be in direct contrast with previously published

information concerning the nesting behavior of Yellow-headed Caracaras.

Bierregaard (1998) identifies Yellow-headed Caracaras as having "unknown breeding biology". While the data presented here do not answer all questions concerning the breeding biology of the Yellow-headed Caracara, it does provide a valuable starting point. In addition to the basic data and observations we recorded, we have found several facts which are unusual (and possibly unique) to the Yellow-headed Caracaras breeding biology. The consistent (and perhaps determinant) laying of four eggs conflicts with the reported 1–2 eggs in del Hoyo *et al.* (1994). The onset of egg laying occurred over a very narrow range of dates: last week of July or first week of August. The delaying of incubation until a full clutch of four eggs has been laid followed by synchronous hatching is unusual for falcons. In fact, the superspecies compatriot of the Yellow-headed Caracara, the Chimango Caracara (*Milvago chimachima*), begins incubation upon laying the first egg (del Hoyo *et al.* 1994).

A relatively short incubation period (22 days) as compared to similarly sized raptors is interesting, particularly in light of the incredibly short fledging period of 17 days. Again, compare these numbers with that of the Chimango Caracara. While the female Chimango Caracara is slightly lighter than the female Yellow-headed Caracara (320 vs 370 g average weight), it has an incubation of 26–27 days (4–5 days longer) and a fledging period of 32–34 days (del Hoyo *et al.* 1994), twice as long as that of the Yellow-headed Caracara. The Chimango Caracara is reported to typically lay 3 eggs, with up to 5 eggs being reported occasionally (del Hoyo *et al.* 1994). Falconids of similar size found outside of South America also appear to have considerably longer incubation and fledging periods. For example, the Australian Hobby (*Falco longipennis*) (female weight about 295 g, Dunning

1992), which is reported to lay 2–4 eggs, incubates for 28–35 days and has a fledging period of 34–38 days (del Hoyo *et al.* 1994). Eleonora's Falcon (*Falco eleonorae*) (female weight about 390 g), normally lays 2–3 eggs which it incubates for 28–30 days, while the fledging period is about 37 days (del Hoyo *et al.* 1994). Clearly the very short incubation period of the Yellow-headed Caracara (22–23 days) and incredibly short 17–18 day fledging period (less than half of the time required by other falconids of similar size) is an aspect that merits further study. We can think of no reason why these times should be so much shorter than similar falconids.

Mader (1981) noted that young fledged during the wet season. His interpretation was based upon two observations from the literature. In the first, Renessen (in Haverschmidt, 1968) described finding a “nearly fledged bird at the end of the dry season”. Similarly, Friedmann & Smith (1950) described finding a recently fledged bird during the wet season in Venezuela, although it is not clear at what phase of the wet season it was found. Taken with our own observations, we suggest that Yellow-headed Caracaras fledge at the start of the wet season, or even prior to, prepared to exploit this food-abundant period.

We suspect that previous reports of stick-nests may have been the opportunistic use of, or commandeering of, other species stick nests. In fact, Sick (1993) reports the use of piles of sticks gathered by both the Fire-wood Gatherer (*Anumbius annumbi*) and the Monk Parakeet (*Myiopsitta monachus*) as nest sites for the Yellow-headed Caracara. Our findings of the use of man-made structures, as well as cavity nesting by Yellow-headed Caracaras, add new information to an area previously considered quite well known.

Our data suggest several interesting questions. Why would the incubation and fledging periods be so short for Yellow-headed Caracaras? We can think of no compelling reason.

Why are our observations about egg numbers and nest construction and location so different than those previously reported? We think that this may be an artifact of previous observations of Yellow-headed Caracaras being done on the extreme periphery of its South American distribution, while our observations were from the center of their known range. At the range periphery, a species is experiencing ecological, and probably physiological, limitations. The differences found in clutch size may be linked to the readily available food supply provided by conditions at the ranch. Consequently, it is unclear if the larger clutch sizes we observed are attributable to differences in position within its geographic range (center vs. peripheral), or unique to conditions created at the ranch. This is one aspect, of many, of the Yellow-headed Caracaras breeding biology that needs to be addressed. Lastly, our new information on a common South American raptor serves to highlight the extreme lack of information available on South American raptors (Bierregaard 1995, 1998).

ACKNOWLEDGMENTS

We are exceedingly grateful to FURNAS-Centraís Eletricas S.A., for providing the opportunity for gathering the data used in this study and to Hamilton Garboggini for help in various aspects of logistics and general information of the study site. We also thank the Universidade Católica de Goiás (UCG) and particularly Dr. Nelson Jorge de Silva Jr., as without them we would have never had a chance to visit and work in Brazil. This manuscript has benefited from the reviews of R. Bierregaard and an anonymous reviewer.

REFERENCES

- Ab'Saber, A. N. 1977. Os domínios morfoclimáticos da América do Sul. Primeira aproximação.

- Geomorfologia 52: 1–21.
- Bierregaard, R. O., Jr. 1995. The biology and conservation status of Central and South American Falconiformes: a survey of current knowledge. *Bird Conserv. Int.* 5: 325–340.
- Bierregaard, R. O., Jr. 1998. Conservation status of birds of prey in the South American tropics. *J. Raptor Res.* 32: 19–27.
- Dunning, J. B., Jr. 1992. CRC handbook of avian body masses. CRC Press, Boca Raton, Florida.
- Friedmann, H. & F. D. Smith, Jr. 1950. A contribution to the ornithology of northeastern Venezuela. *Proc. U.S. Natl. Mus.* 100: 411–538.
- Furley, P. A. & J. A. Ratter. 1988. Soil resources and plant communities of the central Brazilian cerrado and their development. *J. Biogeogr.* 15: 97–108.
- Haverschmidt, F. 1968. *Birds of Surinam*. Oliver & Boyd, London.
- del Hoyo, J., A. Elliot, & J. Sargatal. 1984. *Handbook of the birds of the world*. Volume 2. New World vultures to guinea-fowl. Lynx Edicions, Barcelona.
- Mader, W. J. 1981. Notes on nesting raptors in the llanos of Venezuela. *Condor* 83: 48–51.
- Sick, H. 1993. *Birds in Brazil: a natural history*. Princeton Univ. Press, Princeton, New Jersey.
- da Silva, J. M. C. 1995. Birds of the cerrado region, South America. *Steenstrupia* 21: 69–92.

Accepted 6 May 1999.

