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THE NESTING AND FEEDING BEHAVIOR OF THE ORNATE 
HAWK-EAGLE NEAR MANAUS, BRAZIL

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Key words: Ornate Hawk-Eagle; Spizaetus ornatus; Amazonia; feeding behavior; nesting.

The Ornate Hawk-Eagle (Spizaetus ornatus), found over 
most of tropical Central and South America, is typi-
cally a bird of dense forest (Brown and Amadon 1968).
Nests are difficult to observe in high tropical forests. 
Little has been reported on its biology other than casual 
observations by Slud (Brown and Amadon 1968) and 
Lyon and Kuhnigk (1985). Our study provides infor-
mation on nest activity from copulation and nest build-
ing to 318 days after hatching.

1 Received 9 February 1987. Final acceptance 8 July 
1987.

STUDY AREA AND METHODS

A large stick nest was found in virgin forest 70 km 
north of Manaus, Brazil (2°25'S, 59°50'W, see Bier-
regaard 1984 for general habitat description). We ini-
tiated observations in June 1983 when adult Ornate 
Hawk-Eagles were found on and around the nest. In-
tensive observations were made from 21 September to 
28 November 1983. During this time we recorded 173 
hr of observations on the adults and 77 on the nesting. 
From 28 November 1983 until 27 July 1984 brief daily 
to bi-weekly observations were recorded. An observ-
ation platform constructed 19 m high in a tree and 
72 m from the nest across a clearing allowed an unob-
structed view of the nest.

The sex of the adults was distinguished by size dif-
fences and individual molting patterns. We assumed
The juvenile was captured 23 days after fledging. It was assumed to be a female (Bierregaard 1978, Weick and Hamerstrom 1962) baited with a live chicken. A 12-g transmitter was mounted on the eagle’s central rectrice.

ADULT BEHAVIOR

On the morning of 24 June, the eagles copulated on the nest. We later projected, based on observations of the nestling and an estimated incubation time of 40 days (Brown 1977), that the eggs were laid in the beginning of August. The occurrence of copulations in June indicates the species has a long period of courtship prior to egg laying.

After hatching, whenever the adult male approached the nest area, it vocalized. The female reciprocated by calling from on or near the nest. The calling bouts usually lasted from 2 to 8 min before the female flew to receive prey from the male. The male was observed on the nest only once for a few seconds before the female aggressively chased it off. In contrast, the male Crested Eagle (Morphnus guianensis) studied by Bierregaard (1984) always delivered prey to the nest during 4 weeks of observation and was never aggressively chased away by the female.

Throughout the nesting cycle, the female broke branches from trees within 100 to 200 m of the nest and added them to the nest. Prey remains were routinely removed from the nest at least 2 to 4 times daily and taken to a “dump,” a conspicuous perch 50 m from the nest where the bones were dropped to the forest floor.

On two occasions Blue-and-yellow Macaws (Ara ararauna) and Greater Yellow-headed Vultures (Cathartes melambrotus) passed within 25 m of the nest while both the nestling and adult female were on the nest. The adult called briefly as the vultures passed but did not leave the nest. The eagles showed no response to the macaws or to the presence of a crew of chain sawyers felling the forest within 38 m of the nest.

JUVENILE BEHAVIOR AND DEVELOPMENT

Based on the size of the nestling when we began observations, we estimated that it hatched 2 to 4 days earlier, between 17 and 19 September. At this time, the young was all downy and barely able to lift its head above the nest. We later projected, based on observations of the eagles with prey not represented in skeletal material taken from nest.

Remains of 45 prey items were collected in the nest (Table 1). Scott Robinson (pers. comm.) has recorded the Ornate Hawk-Eagle taking two squirrel monkeys (Saimiri sciureus), a Saddle-backed Tamarin (Saguinus fuscicollis), two spiny woodrats (Proecomys sp.), and three Purple Gallinules (Porphyrio martinica) in Manu Park, Peru.

<table>
<thead>
<tr>
<th>TABLE 1. Spizaetus ornatus prey species identified from bones in the nest and prey observed delivered to the nest.</th>
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</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Reptiles</td>
</tr>
<tr>
<td>Unidentified snake*</td>
</tr>
<tr>
<td>Unidentified lizard (Teiidae)</td>
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<tr>
<td>Total reptiles</td>
</tr>
<tr>
<td>Birds</td>
</tr>
<tr>
<td>Tinamus sp. (major or guttatus)</td>
</tr>
<tr>
<td>Crypturellus sp. (variegatus or soul)</td>
</tr>
<tr>
<td>Crypturellus variegatus</td>
</tr>
<tr>
<td>Ara macao</td>
</tr>
<tr>
<td>Ara sp. (probably manilata)</td>
</tr>
<tr>
<td>Ramphastos vitellinus</td>
</tr>
<tr>
<td>Penelope sp. (probably marail)</td>
</tr>
<tr>
<td>Penelope sp. (probably jacuaca)</td>
</tr>
<tr>
<td>Ornalis motmot</td>
</tr>
<tr>
<td>Smaller birds</td>
</tr>
<tr>
<td>Total birds</td>
</tr>
<tr>
<td>Mammals</td>
</tr>
<tr>
<td>Opossums* (Didelphis marsupialis, Metachirus nudicaudatus)</td>
</tr>
<tr>
<td>Dasyproctidae (Myoprocta sp. or Dasyprocta sp.)</td>
</tr>
<tr>
<td>Myoprocta sp.</td>
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<tr>
<td>Coendu sp.</td>
</tr>
<tr>
<td>Total mammals</td>
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<tr>
<td>Grand total</td>
</tr>
</tbody>
</table>

* Indicates records based on observations of the eagles with prey not represented in skeletal material taken from nest.

that the larger bird found consistently on or close to the nest was the female.

On 12 May 1983, 19 to 26 days after fledging, the juvenile was captured with a bal-chatri trap (Berger and Hamerstrom 1962) baited with a live chicken. A 12-g transmitter was mounted on the eagle’s central tail rectrice.

Seven months after fledging, the nest tree was cut down in the ranch’s attempt to create more cattle pasture. The nest was measured and prey remains removed for identification.

RESULTS AND DISCUSSION

NEST SITE

The nest site was in a small ravine next to a stream 1 to 2 m wide. From rim to rim, the nest was 1.7 m in diameter and located 37 m high in the main fork of an emergent 46-m tall Hymenanua sp. (Leguminosae) tree. The tree’s diameter at breast height was 1 m. The canopy was 11 m in diameter at nest level with branches of 25 cm, 18 cm, and 15 cm in diameter supporting the nest.

PREY SPECIES

Remains of 45 prey items were collected in the nest (Table 1). Scott Robinson (pers. comm.) has recorded the Ornate Hawk-Eagle taking two squirrel monkeys (Saimiri sciureus), a Saddle-backed Tamarin (Saguinus fuscicollis), two spiny woodrats (Proecomys sp.), and three Purple Gallinules (Porphyrio martinica) in Manu Park, Peru.
The juvenile was never found more than 170 m from the nest. Over 90% of the observations were within 100 m of the nest. On 27 July, 225 days after fledging, we observed a food transfer from an adult hawk-eagle to the juvenile within 100 m of the nest. Before the transfer the adult and juvenile called repeatedly 160 m apart for 36 min. The juvenile then left its perch and flew to the adult, grabbed the prey item from its talons without landing and continued to a nearby perch. It continued to exchange calls with the adult for 2 min. These observations indicate that the juvenile hawk-eagle was partially dependent on parental feeding 3-12 days after hatching when the study was concluded. This supports Brown's (1977) generalization that tropical raptors have a long parental dependency period compared to similar sized temperate raptors.

If we assume that Ornate Hawk-Eagles have an incubation period of at least 40 days, they will require well over a year for courtship, nesting, and raising one young to independence. At most, this species may produce one nestling every other year. Such low productivity may make the species sensitive to habitat destruction or hunting pressure.

We appreciated the help of Susan Renner and Antonio Cabral in identifying the nest tree. Antonio Cabral also helped with the construction of the observation platform. Fernando C. Novaes, Jose Maria Cardosa da Silva, and Maria de Fatima Lima identified the prey remains from the nest using reference material at the Museu Goeldi in Belem, Brazil. Rocelino Marajo dos Reis and Luis Raimundo helped with many of the ordeals of living in a remote field site. Scott Robinson provided unpublished data on prey species. The manuscript benefited from conversations with Jay Malcolm and John Eisenberg. This study was supported by the World Wildlife Fund-US, the Instituto Nacional de Pesquisa da Amazonia (INPA), and the Instituto Brasileiro de Desenvolvimento Florestal (IBDF), and represents publication number 32 in the Minimum Critical Size of Ecosystems Project (Dinamica Biologica de Fragmentos Florestais) technical series.

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