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# Predation of a Red-browed Amazon, *Amazona rhodocorytha* (Salvadori, 1890), in Captivity by a Wild Margay, *Leopardus wiedii* (Schinz, 1821)

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## Abstract

*Leopardus wiedii* is a small neotropical felid whose diet primarily consists of small mammals, although birds may constitute significant prey in certain regions. Although birds are part of the margay's diet, no studies have documented psittacid predation in the wild. The only reported case of psittacid predation by the margay occurred in a scientific aviary in southern Brazil, within enclosures located in a forest remnant. The present study reports the predation of an *Amazona rhodocorytha* in captivity by a wild margay in southeastern Brazil. The predation likely occurred at night when the felid entered in the enclosure situated approximately 10 m from the forest edge. The parrot was partially consumed, and the margay was found trapped inside the enclosure the following morning. We suggest that psittacid predation, if it occurs in the wild, is opportunistic and sporadic. This rarity may be due to the social behavior of psittacids, which helps detect potential threats, and their use of high tree branches, making them less accessible to non-flying predators. These behaviors may result in a low predation rate, hindering detection in margay diet studies.

**Keywords:** Atlantic Forest; Felidae; Opportunistic Predator; Predator-Prey Interaction; Psittacidae

## Introduction

The margay, *Leopardus wiedii* (Schinz, 1821), is a small felid (average weight = 3.6 kg) with a wide geographic distribution, ranging from Mexico to northern Argentina and northwestern Uruguay [1]. It is primarily found in forest habitats and is more strongly associated with these environments than other neotropical felid species [1]. Despite its broad distribution, the margay has a much smaller occupancy area and faces habitat loss due to the conversion of forested areas into agricultural lands [2]. In addition to habitat loss, the species is threatened by retaliatory killings due to predation of domestic animals and the loss of individuals to roadkill [3]. In Brazil, which encompasses most of its range, the margay is classified as Vulnerable to extinction [3], while globally it is considered Near Threatened [2].

Distinct characteristics set the margay apart from other felids of the genus *Leopardus* Gray, 1842. These include prominent eyes, a more convex cranial structure, and wide and flexible paws with specialized adaptations in hind feet that enable it to climb tree trunks and move through vegetation with remarkable agility [1]. Its tail is

proportionally longer, serving as an additional adaptation for arboreal locomotion, aiding in balance and acrobatic abilities [1]. This combination of features allows the margay to exhibit a terrestrial-arboreal or scansorial locomotor behavior [4].

The diet of the margay is described as primarily consisting of arboreal mammals and birds [1], or small terrestrial and scansorial mammals, although birds can represent important food items in some regions [2].

Here we report the predation of a red-browed amazon, *Amazona rhodocorytha* (Salvadori, 1890), in captivity by a wild margay.

## Materials and Methods

The predation record was obtained at the Vale Natural Reserve (Reserva Natural Vale - RNV; 22,711 ha), located in the municipality of Linhares, in the state of Espírito Santo, southeastern Brazil (19°06' S, 39°45' W and 19°18' S, 40°19' W). The predation involved a red-browed amazon that was part of a group of 40 individuals being prepared for release at the RNV as part of a reintroduction project (IBAMA Memorandum No. 477/2008/DBFLO). The project included the construction of a pre-release acclimatization enclosure and two smaller support enclosures for eventual individual care (Figure 1).

The enclosures were located in the public-use area of the RNV, placed 5 to 10 meters from the forest edge. They were constructed from treated eucalyptus logs and enclosed with galvanized wire mesh (12-gauge, 2.54 cm mesh size, point-welded). The enclosures were partially covered with colonial-style ceramic tiles. Each support enclosure measured 2.0 m in width, 3.0 m in length, and 2.0 m in height, with the floor installed 1.5 m above the ground. The eucalyptus logs that supported these suspended enclosures were covered with metal plates (50 cm in height), fixed close to the floor of the enclosure, to hinder climbing by terrestrial animals. The support enclosures featured a door measuring 0.9 m in width and 1.0 m in height, made of treated wood with embedded mesh and a hinged system. The enclosure door had a lock positioned at mid-height of the structure.

**Figure 1:** The pre-release acclimatization enclosure (in the background) and the two smaller support enclosures (in the foreground), constructed in Vale Natural Reserve, southeastern Brazil [Photo credit: Ana Carolina Srbek-Araujo].

## Results and Discussion

The release of the parrots was carried out at the RNV on January 14, 2009. One parrot was having difficulty flying, and on January 18, it was captured for evaluation [5]. It was found that at least four primary feathers were missing from its right wing. The specimen was then transferred to one of the support enclosures to allow time for its feathers to fully regrow before a subsequent release attempt [5]. The predation likely occurred at night, after sunset on January 19. The predation was discovered on the morning of January 20, when water and food were brought to the specimen. The parrot had been partially consumed, and an adult margay was found inside the enclosure. The margay forced the door to enter the enclosure but was unable to escape, as the lock had not been released. Upon confirming the predation, the enclosure door was opened to allow the margay to leave.

The red-browed amazon is endemic to the Atlantic Forest in northeastern and southeastern Brazil, occurring in the humid forests of the coastal strip of central-eastern Brazil [6,7]. The front of its head is brightly red, as is the base of the maxilla; the area between the eye and beak is orange; and the cheeks and neck are blue [6]. The body is predominantly green, with reddish feathers on the edges of the wings, while the tail feathers are yellowish with red markings. It has a distinctive vocalization [6] and is a highly persecuted species for illegal domestic and international trade [7]. It is currently classified as Vulnerable to extinction [7,8].

Avian predation by margay is recorded in several locations and birds are generally the second most represented prey item in its diet. The frequency of bird consumption exceeded 50% of the samples analyzed in only three areas where the diet of this feline was systematically studied: Espírito Santo [9], São Paulo [10] and Rio Grande do Sul [11]. In one of these areas, the rate of bird consumption was higher than that of mammals [10]. However, the consumption of psittacids has not been reported in any of the studies conducted in the wild. The only report of psittacid consumption by the margay was from southern Brazil (state of Santa Catarina), where opportunistic predation of wild birds kept in captivity was documented [12]. Among the wild species predated, the death of *Amazona rhodocorytha* parrots and four other species from the same genus was reported [12]. In this case, the attack occurred in a scientific aviary, within enclosures located inside a forest remnant.

Despite bird predation being common for the margay, the only known report of psittacid predation involves birds kept in captivity. Thus, we suggest that predation of psittacids, if it occurs in the wild, happens opportunistically and sporadically. The absence of predation or the low consumption rate of this group may be related to: (1) the social behavior of psittacids, which facilitates the detection of potential threats through social signals emitted by other individuals [13]; and (2) the use of higher branches in the tree canopy, with psittacids flying from one emergent tree to another [6], which makes it difficult for non-flying predators to capture them. These behaviors likely result in a low predation rate and, consequently, the absence of scientific records of predation in the wild, as rare prey is harder to detect in diet studies.

The occurrence of predation records involving captive psittacids highlights the importance of implementing security measures in enclosures to prevent predatory interactions with the margay. We recommend using locking systems with multiple fixation points on the doors to reduce the potential for structural distortion that could allow access to the interior of the enclosures. In addition to secure locking systems, we emphasize the importance of using robust and resistant materials in the construction of enclosures, such as those mentioned in the present study.

## Conflicts of Interest

The authors declare that there are no conflicts of interest associated with this publication.

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