



Naïve Encounters With Chimpanzees in the Goulougo Triangle, Republic of Congo

Dave Morgan^{1,3} and Crickette Sanz²

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We describe the behavior of an unhabituated population of chimpanzees in the Goulougo Triangle, Republic of Congo. We encountered chimpanzee parties on 218 occasions during two field seasons (February 1999–December 1999, June 2000–June 2001). Overall contact rate was 0.63 contacts per day in the field ($n = 347$). During the first 5 min of observation, we recorded individual responses as curious, ignore, hide, or depart. In contrast to other unhabituated chimpanzees, curiosity was the most common response (84%) of individuals in the Goulougo Triangle. However, the responses were deeply integrated in the group's reaction to our arrival and behavior throughout an encounter. Based on the behavior of the majority of individuals in a group, we categorized entire contact events as naïve, ignore, nervous, or depart. Naïve contacts accounted for 69% of all encounters. Other contacts types occurred much less frequently: nervous (12%), depart (11%), ignore (8%). Naïve contacts were characterized by chimpanzees that continued to exhibit curiosity throughout the encounter, the arrival of other individuals at the contact location, and relatively prolonged contact with observers (average duration: 136 min). It is likely that the high frequency of curious responses and naïve contacts are due to the remote location of the Goulougo Triangle and the chimpanzees's lack of experience with humans. Documentation of this naïve phenomenon has been successfully used to lobby for the protection of the chimpanzees and their habitat.

KEY WORDS: *Pan troglodytes troglodytes*; chimpanzee; curious; naïve.

¹Wildlife Conservation Society, Republic of Congo.

²Washington University, St. Louis.

³To whom correspondence should be addressed at 1431 Island Dr. S., St. Petersburg, Florida 33707; e-mail: goulougo@uuplus.com.

With the goal of directly observing the full repertoire of chimpanzee behavior, researchers at various field sites have dedicated many resources toward achieving habituation: the acceptance by wild animals of a human observer as a neutral element in their environment (Tutin and Fernandez, 1991). In general, chimpanzees have been difficult to habituate unless provisioned or patiently followed for several years. As a result, only several chimpanzee communities have been successfully habituated: Gombe Stream National Park (Goodall, 1986); Mahale Mountains National Park (Nishida, 1990), Kibale Forest National Park (Wrangham *et al.*, 1996), Budongo Forest Reserve (Reynolds, 1992), Tai National Park (Boesch and Achermann-Boesch, 2000); and Bossou (Sugiyama, 1981). All of them are located in eastern or western Africa and represent only 2 of the 4 subspecies of chimpanzee: *Pan troglodytes schweinfurthii* and *Pan troglodytes verus*.

Currently, there are no habituated communities of *Pan troglodytes troglodytes*, which live in central Africa. Research on the central subspecies has been limited to surveys of indirect evidence—nests, feeding signs, feces, tracks—and occasional observations of unidentified individuals (Fay and Carroll, 1992; Garcia and Mba, 1997; Gonder *et al.*, 1997; Idani, 1994; Ihobe, 1993, 1995; Kuroda *et al.*, 1996; Moutsambote *et al.*, 1994; Nishihara, 1995/1996; Tutin and Fernandez, 1984, 1985, 1993a,b; Tutin *et al.*, 1994; White and Tutin, 2001; Yamagiwa *et al.*, 1995). Attempts have been made to habituate chimpanzee communities in central Africa by Nishihara (1995/1996) and Tutin and Fernandez (1991). Tutin and Fernandez (1991) documented the behavioral responses of chimpanzees to humans in the Lopé Reserve, Gabon. The most common responses were immediate departure by flight, approach/wait for another before moving away from the observer, and stealthy retreat. They very rarely exhibited hide, ignore, charge, or curiosity. Researchers at Guga in the Ndoki Forests of the Republic of Congo succeeded in directly observing chimpanzees, but a community was never habituated during their 7-year research presence (Nishihara, 1995/1996). Due to paucity of data from direct observation of *Pan troglodytes troglodytes*, the expansion of mechanized logging, and the effects of rapidly increasing human populations, it became a priority to identify a site in central Africa where chimpanzee research was feasible.

In February 1999, a study site was established in the Goulougo Triangle, Republic of Congo. Initial survey teams reported that chimpanzees there did not immediately flee at the approach of humans, the most common response of unhabituated chimpanzees (Fay, 1993). Instead of retreating, the chimpanzees responded to the arrival of human observers with curiosity and interest. Blake (1995) and Fay (1993) labeled the behavior naïve. It is probably restricted to individuals with very limited exposure to humans. Due to the remote location of the Goulougo Triangle, the chimpanzee population and

their habitat have remained undisturbed. The Ndoki and Goulougo Rivers form the western and eastern borders of the Goulougo Triangle. Their floodplains are dominated by swamps that may have formed geographical barriers to human encroachment. We documented the chimpanzees's responses to our presence and its implications for conservation efforts in the region.

STUDY SITE & METHODS

Study Site

The Goulougo Triangle is located within the Nouabalé-Ndoki National Park (2°05'–16°56' N; 3°03'–16°51' E), Republic of Congo (Fig. 1). The study area covers 30,000 ha of lowland forest and altitudes range between 330 and 600 m. Four habitat types occur in the Goulougo Triangle: monodominant *Gilbertiodendron* forest, *Gilbertiodendron* mixed species forest, mixed species forest, and swamp forest (Fay, 1993, 1997; Kuroda *et al.*, 1996; Moutsambote, *et al.*, 1994).

The climate is transitional between the Congo-equatorial and subequatorial climatic zones (White, 1983). Rainfall is bimodal with a main rainy season from August through November and a short rainy season in May. Average monthly rain fall and temperatures at Mbeli Bai base camp, Republic of Congo, 17 km from the study area, are 1,710.9 mm (Stokes, 2000) and 21.1°C (minimum) and 26.5°C (maximum). There is little seasonal variation in temperature (Stokes, 2000).

Methods

Chimpanzee Detection and Contact Protocol

We used 4 methods to locate chimpanzees: mimicking duiker calls to attract them, hearing their vocalizations or buttress drumming, opportunistic encounters, or conducting vigils of fruiting trees. We most frequently located chimpanzees by approaching vocalizing groups or by opportunistic encounters while walking through the forest. Encounters or contact events involved the direct observation of ≥ 1 chimpanzee. During all contacts, observers minimized disturbance to the chimpanzees by immediately sitting down and remaining quiet. Throughout the contact, chimpanzees dictated the proximity to the stationary human observers by either moving closer or retreating. Time of day, environmental conditions, or detection of other groups occasionally prompted the observers to end contact.

Data Collection Protocols

During the first 5 min of observation, we recorded individual responses as curious, ignore, hide, or depart (Table I). We did not recognize the vocalization categories defined by Tutin and Fernandez (1991) as independent responses, but instead as components of other categories. We collapsed approach/wait for another, avoid, flight, and stealthy retreat into a single category: depart. We observed no change.

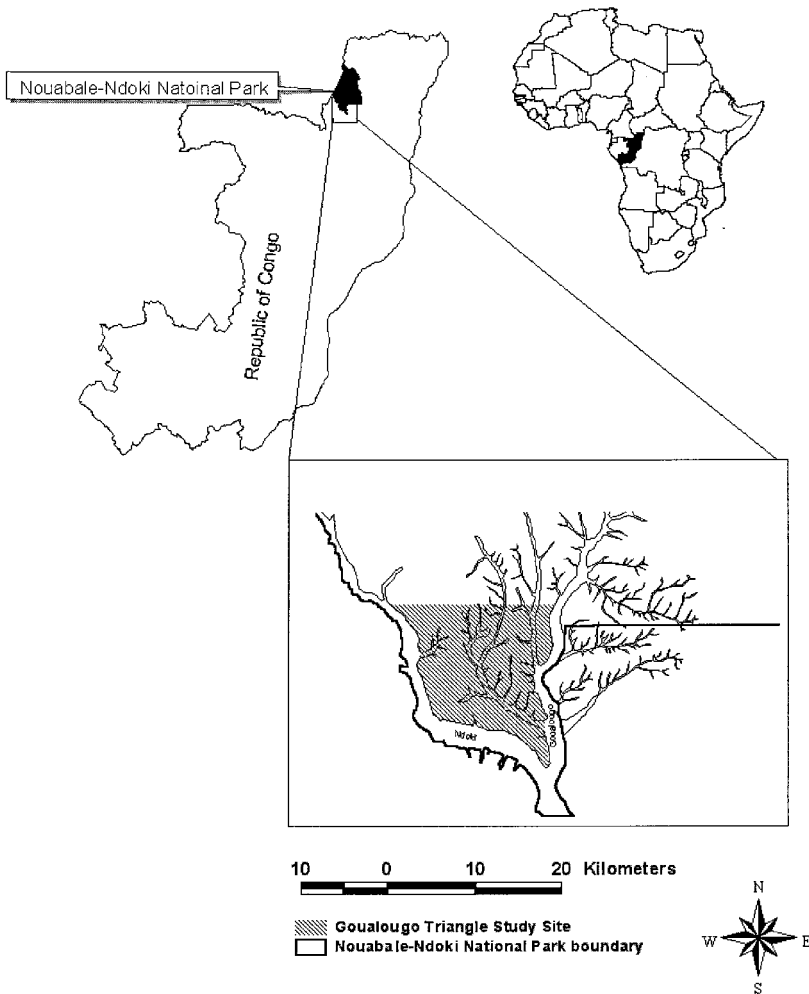


Fig. 1. Goulougo Triangle study site.

Table I. Individual response categories (adopted from Tutin and Fernandez, 1991)

| | |
|---------|---|
| Curious | Individual response includes ≥ 2 of the following elements: staring, head swaying, crouching to get a better view of human observers, moving closer to observers, slapping tree trunk to elicit response, inquisitive vocalizations, following observers as they depart. |
| Ignore | No discernable response shown. After noticing an observer, individual continues with previous activity. |
| Hide | Individual departs from view, but remains at contact location. We occasionally see individual peering toward us through thick vegetation. |
| Depart | After detecting human observers, individual leaves contact location. This definition incorporates all departure categories defined by Tutin and Fernandez (1991). |

We categorized entire contacts as naïve, ignore, nervous, or immediate departure (Table II). Although chimpanzees may have shown different behaviors, the classification is based on the behavior of the majority of individuals.

We collected the following data during each contact: method of location; contact location (forest type, location in canopy or on ground); age-sex class per Goodall (1986) of all individuals; party size; party type per Doran (1997); overall contact duration. We identified individual chimpanzees via detailed documentation (sketches and video recorded images) of distinctive physical characteristics (Morgan, 1999). A spotting scope (Bausch and Lomb 15-45 \times 60) aided in viewing the physical features of distant chimpanzees.

Table II. Contact type categories

| | |
|---------------------|--|
| Naïve | After initial response, the majority of chimpanzees present at a contact show continued curiosity toward human observers (as indicated by exhibiting curious behaviors: (Table I). After a period of intense interest, chimpanzees may return to previous activities while monitoring human observers (For example, chimpanzee may build a day nest and then watch human observers while resting). |
| Ignore | Throughout the contact, chimpanzees show no discernible interest in observers. After noticing arrival of observers, chimpanzees continue with their previous activities. |
| Nervous | Chimpanzees retreat from observers by moving higher in canopy or hiding behind vegetation. Chimpanzees alternate attention between monitoring observers and other chimpanzees in the party. Other indications of nervousness include pilo-erection, self-scratching, and loose stool. |
| Immediate departure | All chimpanzees immediately depart after becoming aware of human presence. Same as depart category for individual response. |

Data Analyses

To allow intersite comparisons, we present individual responses in the same format as Tutin and Fernandez (1991) and Johns (1996). However, we conducted no statistical analysis on the individual responses because our study showed that data within each cell were not independent. Based on repeated contacts of known individuals, individual chimpanzees were represented more than once in a single cell.

Contact types aptly depicted the behavior exhibited by groups of chimpanzees in the Goulougo Triangle to the arrival of our research team. Although the same individuals were present at several contacts, we treated contact events between different groups of chimpanzees on different days as independent data points. We used Chi-square and Kruskal Wallis tests to evaluate the relationship between contact categories and other variables.

RESULTS

We collected data during 347 days in 2 field seasons (February 1999–December 1999, June 2000–June 2001). We have total of 365 h of direct observations during 218 chimpanzee contacts. Overall encounter rate is 0.63 contacts per field day. We contacted chimpanzees most frequently by following vocalizations and buttress drumming to the source (56% of contacts). Other means of locating chimpanzees include opportunistic encounters (34%), vigils of fruiting trees (8%) and mimicking duiker calls (1.4%).

Initial Responses and Contact Types

The most frequent individual response was curiosity and the most common contact type was naïve. Table III has the overall relative frequencies of individual responses by age-sex class. Curious responses were shown by 84% of individuals, and chimpanzees in each age-sex class are represented.

Table III. Individual response to human observers

| Response | Adult | | Subadult | | Juvenile | | Infant | Unk. | Total |
|-----------|-------|--------|----------|--------|----------|--------|--------|------|-------|
| | Male | Female | Male | Female | Male | Female | | | |
| Curiosity | 266 | 278 | 56 | 38 | 41 | 45 | 177 | 49 | 950 |
| Ignore | 12 | 19 | 2 | 3 | 3 | 1 | 11 | 5 | 56 |
| Hide | 9 | 26 | 0 | 3 | 3 | 7 | 24 | 14 | 86 |
| Depart | 3 | 5 | 0 | 1 | 1 | 0 | 5 | 24 | 39 |
| | 290 | 328 | 58 | 45 | 48 | 53 | 217 | 92 | 1131 |

Table IV. Comparison of individual responses among field sites

| Individual response | Lopé Reserve (<i>n</i> = 153) | Kibale Forest (<i>n</i> = 436) | Goulougo Triangle (<i>n</i> = 1131) |
|---------------------------|-----------------------------------|------------------------------------|---|
| Curiosity | 1% | 6.70% | 84.00% |
| Ignore | 3% | 25.80% | 4.95% |
| Hide | 5% | 6.90% | 7.60% |
| Depart | 74% | 35.6% | 3.45% |
| Flight | 39% | 25.50% | 1.41% |
| Stealthy retreat | 10% | 9.60% | 2.03% |
| Approach/wait for another | 25% | 0.50% | — |
| Charge | 1% | 13.10% | — |
| Loud vocalizations | 8% | 7.10% | n/a |
| Soft vocalizations | 8% | 4.80% | n/a |

In Table IV we compare our results with chimpanzee responses in Lopé Reserve (Tutin and Fernandez, 1991) and Kibale Forest (Johns, 1996). In Goulougo, naïve contacts accounted for 69% of all encounters (Table V). Other contact types occurred much less frequently: nervous (11%), depart (11%), ignore (8%).

Individual Identification and Repeated Contacts

We have identified 152 individual chimpanzees in the Goulougo Triangle study area. The average number of contacts for each individual is 3.63 ± 4.04 (range = 1–21). Ninety-eight percent of known individuals have participated in ≥ 1 naïve contact. Some individuals have continued to exhibit curious behaviors after >20 contacts with human observers.

Table V. Duration of contacts ended by chimpanzees and humans

| Contact type | Proportion of total contacts | Average duration | SD |
|--|------------------------------|------------------|-------------|
| <i>Chimpanzees end</i> (<i>n</i> = 118) | | | |
| Naïve | 29% | 2 hr 16 min | 1 hr 38 min |
| Ignore | 6% | 2 hr 22 min | 2 hr 15 min |
| Nervous | 7% | 42 min | 37 min |
| Depart | 11% | 2 min | 1 min |
| | 54% | 1 hr 37 min | 1 hr 44 min |
| <i>Humans end</i> (<i>n</i> = 100) | | | |
| Naïve | 40% | 1 hr 55 min | 1 hr 25 min |
| Ignore | 2% | 35 min | 12 min |
| Nervous | 4% | 38 min | 40 min |
| Depart | 0 | — | — |
| | 46% | 1 hr 45 min | 1 hr 24 min |

Contact Location

As indicated by contact locations, chimpanzees showed a significant preference for certain forest types ($\chi^2 = 180.48$, $df = 2$, $p < 0.01$). Chimpanzees occurred most often in mixed species forest (76%) and much less frequently in *Gilbertiodendron* mixed species forest (14%) and *Gilbertiodendron* forest (10%). We never contacted chimpanzees in swamps. Forest type is not significantly related to contact type ($\chi^2 = 0.88$, $df = 3$, NS).

We contacted chimpanzees more often in the canopy (67%) than on the ground (33%). When contacted on the ground, chimpanzees were twice as likely to immediately depart than when contacted in the canopy. During 49.5% of all contacts, chimpanzees were observed descending to the ground. They were most likely to descend to the ground during naïve contacts and least likely during nervous contacts.

Party Size and Composition

Average initial party size is 3.22 ± 2.07 chimpanzees ($n = 218$, range = 1 to 14). There is a significant difference between party size distributions among contact types (Kruskal-Wallis, $H = 29.21$, $df = 3$, $p < 0.01$; (Fig. 2)). Small initial party sizes are associated with immediate departures, and large initial party sizes are associated with naïve contacts. The small party size reflects the large proportion of lone individuals that immediately departed. Large party sizes are related to the relatively high proportion of mixed parties associated with naïve contacts (Fig. 2).

During 74 contacts, party size increased. Most of the increases (95%) occurred during naïve contacts. For naïve contacts in which party size increased, the average number of new arrivals is 6 ± 4.15 chimpanzees ($n = 70$, range = 1 to 18). Average total party size for other contact types is similar to initial party size. Increases in party size are significantly related to contact type ($\chi^2 = 34.40$, $df = 3$, $p < 0.01$). Table VI shows average initial party size, number of new arrivals, and total party size among contact types.

Contact Duration

The average duration of contacts is 100 ± 95 minutes ($n = 218$). In Table V, we compare duration of contacts ended by chimpanzees and humans by contact type. Duration of contacts ended by chimpanzees is related to contact type (Kruskal-Wallis, $H = 66.64$, $df = 3$, $p < 0.01$). Depart contacts were brief and showed relatively little variability, range of 1–5 min. In contrast, naïve and ignore contacts typically lasted >2 h with high variability, ranging from <10 min to >7 h.

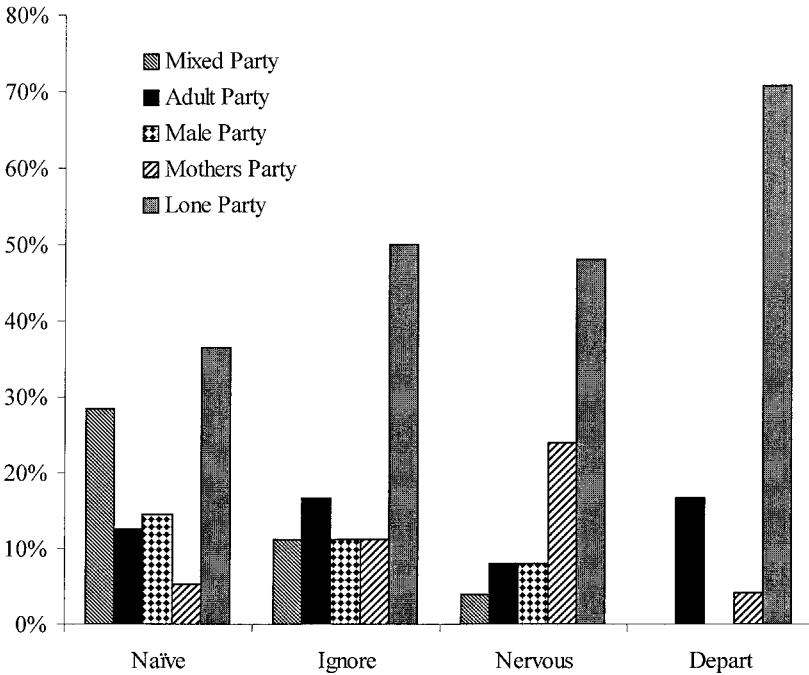


Fig. 2. Proportions of different party types by contact type.

DISCUSSION

Chimpanzees residing in the remote forests of the Goulougo Triangle most often responded with curiosity to our research presence. Comparing our data with reports from other sites, showed that the proportion of curious responses is relatively high (Johns, 1996; Tutin and Fernandez, 1991). However, researchers conducting initial surveys in remote regions of equatorial Africa have reported similar encounters with groups of curious primates. Kortlandt (1962) described encounters with chimpanzees that showed little

Table VI. Relationships between contact type and associated factors

| Contact type | Initial location | Departure location | Party size initial (increase) | Party size overall | Average duration |
|--------------|------------------|--------------------|-------------------------------|--------------------|------------------|
| Naïve | Canopy | Descend to ground | 3.51 (2.78) | 6.29 | 136 min |
| Ignore | Canopy | Remain in canopy | 2.78 (0.33) | 3.11 | 142 min |
| Nervous | Ground | Remain in canopy | 3.32 (0.12) | 3.44 | 42 min |
| Depart | Ground | Depart on ground | 1.63 (0) | 1.63 | 1 min |

fear toward humans in the Democratic Republic of Congo. In Tanzania, Itani and Suzuki (1967) described encounters with chimpanzees that exhibited curiosity toward their human observers. During a census of primates in the Ituri Forest, Thomas (1991) found that in remote locations chimpanzees showed less fear than those that lived in close proximity to humans. They share a suite of behaviors with chimpanzees in the Goulougo Triangle suggesting that they had limited contact with humans and had not experienced the negative impacts of human presence, such as hunting, poaching, and habitat destruction.

During the past two years of surveys in the Goulougo Triangle, we have observed that the majority of chimpanzees encountered over a large landscape responded to us with curiosity. This phenomenon is more robust than a few curious individuals; it seemed that the entire population was responding to a novel stimulus in their environment. This was reinforced by several instances when the chimpanzees showed curiosity toward other objects. For example, we observed adult chimpanzees exhibiting curiosity toward unattended backpacks left on the path, tarps, and our empty campsites. During the past two years, we never encountered other humans or their signs—cut paths, campsites, trees slashed for rubber—in the Goulougo Triangle. From the history of the study area, it is likely that our presence constitutes most of these chimpanzees's only experiences with humans. This is further substantiated by their initial responses and continued curiosity.

We also observed that an individual's reaction was deeply integrated within a group's response to our presence. Within contacts, individuals seemed to be socially referencing from others. If an individual crouched or moved toward us for a better view, others would also exhibit the behavior. A calm chimpanzee's relaxed behavior seemed to soothe others, even if the same individuals showed nervous behaviors in different company. In contrast, a more fearful individual could easily rouse other chimpanzees with frequent vocalizations and nervous behaviors. Departures also seemed to be coordinated as all individuals in a group departed one after another through the canopy or single-file on the ground. The reaction of chimpanzee groups to our presence prompted us to categorize entire contact events as naïve, ignore, nervous, or depart (Table VI).

Naïve contacts were characterized by curiosity (Table I), the arrival of other chimpanzees, and maintaining prolonged contact with observers. During naïve contacts, there were many occasions when several individuals in a group would continue to show curiosity throughout the encounter. They would move closer, circle around us in the canopy and on the ground, and remain for hours intently watching us. The excited and inquisitive vocalizations of chimpanzees initially contacted seemed to draw others to the location. New arrivals often vocalized as they approached. Even chimpanzees

that had been contacted several times would join focal groups and monitor us with interest. On many occasions, we ended naïve contacts with groups intently watching us depart and sometimes even following us through the forest.

The discovery of a naïve population and their trust in humans is coupled with an obligation to ensure their long-term protection. Similar to habituated chimpanzees, their lack of fear toward humans could make them easy victims of poachers. We have also had naïve contacts with other primate species that would be vulnerable to hunting, including gorillas (*Gorilla gorilla gorilla*), grey-cheeked mangabeys (*Lophocebus albigena*), and black-and-white colobus (*Colobus guereza*). Serving as both a conservation and research presence in the Goualougo Triangle, we established a study site and began systematically to document the ecology and behavior of the chimpanzees. Within a relatively short time, we observed several behaviors that have been recorded at long-term study sites, including tool use, meat eating, food sharing, gestural communication, mating, reassurance, grooming, and nesting. We have also begun to elucidate the social structure, ranging patterns, and feeding ecology of a main study community.

Due to the rapid expansion of commercial timber extraction and increasing human populations, chimpanzee habitats throughout Africa are disappearing at an alarming rate. However, the discovery of naïve chimpanzees in northern Congo provides hope that intact habitats and populations still remain. Initial survey teams documented many aspects of the area that are important to conservation and science, but it was the naïve encounters with chimpanzee groups that highlighted the Goualougo Triangle as a conservation priority. Documentation of the chimpanzee's naïve behavior assisted in persuading government officials and the local logging company to preserve this pristine habitat. In July 2001, the Goualougo Triangle was annexed to the Nouabalé-Ndoki National Park as a result of collaboration between the Wildlife Conservation Society, the Congolese Ministry of Water and Forests, and Congolaise Industrielle du Bois. This is an example of how research and conservation efforts can be combined to identify and pursue the protection of remaining chimpanzee habitats.

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