**Résumé :**

La guerre civile en Côte d’Ivoire entre 2002 et 2010 a engendré une augmentation des perturbations anthropiques et la disparition des lions (*Panthera leo*) du Parc National de la Comoé (PNC). Après la crise, de nombreux efforts pour conserver et restaurer cet écosystème et sa biodiversité ont été faits et l’autorité de gestion envisage la réintroduction des lions. Nous avons évalué l’acceptation de la réintroduction des lions par les populations riveraines. A travers une enquête sociologique, nous avons administré des questionnaires à 307 personnes dans 23 villages riverains du PNC. Une majorité (71% ; n=218) des répondants est favorable au retour des lions dans le PNC avec une variation significative au sein des groupes ethniques. L’analyse GLM (modèle linéaire généralisé) révèle qu’en dehors de l’ethnie, la profession et la provenance (village) sont significativement déterminants pour l’acceptation de la réintroduction des lions au PNC. La plupart des répondants (96% ; n=296) a connu les lions au PNC. La majorité des répondants (81% ; n=250) a reconnu avoir coexisté avec les lions, les conflits antérieurs avec ces lions signalés par 16% (n = 49) des répondants et la volonté de cohabiter avec les futurs lions manifestée par 81% (n=248) des enquêtés. Plus de 84% (n=260) des répondants pensent qu’il y aura des bénéfices liés au retour des lions au PNC et respectivement 52% (n=161) et 14% (n=44) des répondants estiment que les bénéfices potentiels seront supérieurs et inférieurs aux risques éventuels liés au retour des lions au PNC. Un peu moins de la moitié des répondants (42% ; n=129) a confirmé la gestion participative actuelle du PNC alors que la majorité (91% ; n=280) a confirmé pouvoir prendre des mesures personnelles de protection contre les futures lions. Nous recommandons l’amélioration de l’implication des communautés autochtones dans toute action de réintroduction et la mise en œuvre des projets d’éducation environnementale comme une condition pour la réintroduction potentielle des lions.

**Mots clés :** Comoé ; Crise socio-politique ; Perturbations anthropiques ; Acceptation de la réintroduction ; Perceptions locales.

**Abstract:**

The civil war in Côte d’Ivoire between 2002 and 2010 led to a hike in human disturbances and the disappearance of African lions (*Panthera leo*) from the Comoé National Park (CNP). After the crisis, many efforts to conserve and restore this ecosystem and its biodiversity have been made and the management authority is considering the reintroduction of lions. We assessed the acceptance of the reintroduction of the lions by the local populations; through a sociological survey, we administered questionnaires to 307 people in 23 villages bordering CNP. A large majority (71%, n=218) were in favor of the return of the lions, with significant variation among ethnic groups. A general linear model analysis (GLM) revealed that apart from ethnic group, profession and origin (village) are significantly determinant for the acceptance of lion reintroduction to CNP. Most respondents had knowledge of the species (96%, n=296). The majority of respondents (81%, n=250) acknowledged having coexisted with lions, with previous conflicts with lions reported by 16% (n = 49) of respondents and a willingness to coexist with future lions reported by 81% (n = 248) of respondents. More than 84% (n=260) of respondents believed that there would be benefits associated with lion return to CNP and 52% (n=161) and 14% (n=44) of respondents believed that the potential benefits would be greater and less than the possible risks associated with lion return. Just under half of respondents (42%; n=129) confirmed the current participatory management of CNP while the majority (91%; n=280) confirmed the possibility of taking own precautions to prevent attacks from future lion. We recommend the improvement of the involvement of indigenous communities in any reintroduction and the implementation of environmental education projects as a condition for the potential reintroduction of lions.

**Keywords:** Comoé; Socio-political crisis; Anthropogenic disturbances; Acceptance of reintroduction; Local perceptions.

**Introduction**

Despite decades of conservation effort, biodiversity is rapidly being degraded across West and Central Africa (Mallon *et al*., 2015; Sarrazin & Barbault, 1996). Wildlife is mostly confined to protected areas but even there conservation is not always effective (Brashares *et al*., 2001; Brugiere et al., 2015). The situation is of great concern in West Africa where there are increasing population declines of many species due to hunting, habitat loss and degradation. Several carnivore species including the lion *Panthera leo* (Linnaeus, 1758), are threatened (Bauer *et al*., 2015; Henschel *et al*., 2010; IUCN SSC Cat Specialist Group, 2018).

The subspecies *Panthera leo leo* is classified as Vulnerable due to the loss of at least 75% of its original habitat (Barnett *et al*., 2009; IUCN SSC Cat Specialist Group, 2018). The situation is more critical in West Africa, where lions are classified as Critically Endangered at the regional level with fewer than 500 survivors and fewer than 250 mature lions (Henschel *et al*., 2015).

Comoé National Park (CNP), located in northeastern Côte d’Ivoire, is one of the former habitats in West Africa where lions lived until the late 1990s. In CNP, lions used to hunt small and medium-sized prey in contrast to what we known about the Eastern and Southern African lions (Bodendorfer *et al*., 2006). During the civil war in Côte d’Ivoire from 2002 and 2010 an influx of refugees led to severe degradation CNP and the inscription of the park on the World Heritage in Danger List in 2003 (IUCN, 2008). The disappearance of the lion from CNP occurred in the same period. With the current socio-political stability and the efforts made by the Ivorian government through the Office Ivoirien des Parcs et Réserves OIPR, a positive trend in the state of its biodiversity has been noted and the park has been removed from the "World Heritage in Danger List" since 2017 (<https://www.iucn.org/km/node/28689>). Clearly, the ecological and environmental conditions in CNP became favorable and the management authority is considering the reintroduction of lions (Djafarou & Kalpers, 2013; OIPR, 2015). To reduce the extinction risk and improve the conservation status, reintroduction into former natural habitats should be based on the Guidelines for reintroductions of the International Union for Conservation of Nature (IUCN/SSC, 2016; IUCN SSC Cat Specialist Group, 2018; Mechin, 2012; Paquette-Boisclair, 2019; Seddon et al., 2014).

Aside from the requirements for the availability of suitable prey and preferred habitats that are crucial to ensure the existence of large carnivores such as lions (Karanth et al., 2004), their return to historic habitats dominated by human populations creates the critical need to understand community attitudes towards their new presence (Zajac et al., 2012). Human-wildlife conflict as a major source of mortality of large carnivores and particularly lions in protected areas, illustrates the consequences of the failures of conservation that does not integrate local people (Balme et al., 2009; Redpath, 2017 ; Woodroffe and Ginsberg, 1998). People engage in activities that affect the survival of large carnivores such as direct killing (Rosenblatt et al., 2014; Watson et al., 2013), reduction in habitat quality and prey availability (Ripple et al., 2015; Watson et al., 2014), and limitation of usable space and activity patterns (Boydston et al., 2003; Kolowski & Holekamp, 2009; Kolowski et al., 2007; Schuette et al., 2013). Involving local communities and taking into account their perceptions regarding the return of lions is therefore fundamental to the future management of this species in CNP (Redpath, 2017). Considering the potential reintroduction of lions to CNP, we aim to: (1) assess the degree of acceptance of lion return by local communities; (2) assess levels of knowledge, past coexistence and past conflicts with lions; (3) analyze benefits and risks perceptions toward the return of lions by the local populations; and (4) identify socio-demographic determinant factors for the acceptance of lion return. Hypotheses related to these objectives are: (1) a majority of local people want lions to be returned into CNP; (2) acceptance varies significantly between ethnic groups and socio-professional categories; (3) livestock depredation was limited and human lion conflict was historically tolerable; (4) potential perceived benefits of lion return outweigh the possible risks; and (5) socio-demographic factors are key to acceptance of lion return to CNP. This study will guide authorities in making appropriate decisions to limit post-reintroduction problems (IUCN/SSC, 2016).

**Material and methods**

**Study area**

CNP is located in the northeast of the Republic of Côte d'Ivoire, between latitudes 8°30' - 9°36' North and longitudes 3°6' - 4°25' West, and covers an approximate area of 11,500 km2 (Figure 1). The major watercourse is the Comoé River, which crosses the park in its western part from north to south and gives it its name. The climate is tropical sub-humid with two seasons, a long rainy season and a long dry season. The dry season can last up to 8 months, and covers the period from October to May. This is the period for development and management activities in CNP. The rainy season runs from June to September and the park is mostly inaccessibility during this period. March is the hottest month with temperatures around 37°C while January is the least hot with an average temperature of around 15°C. Annual precipitation ranges from 900 mm to 1200 mm with an average of 1084 mm per year (Fisher and Linsenmair, 2002). The average annual temperature ranges from 26 °C to 27 °C (OIPR, 2015). There are four main vegetation types in CNP namely gallery forests, forest patches, tree savannas and shrub savannas;savanna formations occupy more than 80% of the total area of the park (Poilecot, 1990; Schweter, 2016). As Comoé National Park is located at the transition zone, wildlife is diverse with savannah and forest species, including the Chimpanzee and forest elephant, and a variety of antelope species. In spite of the fact that the secondary streams and most of the pools dry up during several months of the year, the Comoé River, Iringou River, Kongo River and some other tributaries provide wildlife with ample access to water. Several saltpans allow the animals to cover their needs in mineral salts. Recent works in CNP including the last aerial census had identified 19 prey species and the Western hartebeest (*Acelaphus buselaphus major*), the African buffalo (*Syncerus caffer*), the kob (*Kobus kob*) and the roan antelope (*Hippotragus equinus*) are the most common species (Atta *et al*., 2021; Linchant *et al*., 2022; OIPR-PROFIAB II 2019, unpublished data).

The main ethnic groups around CNP are Koulango, Lobi, Djimini, and Malinké (OIPR, 2015). Their settlement occurred in successive waves in the 16th and 19th centuries. In addition to these four main communities, there are Peuhl nomads. Already a long-standing presence, they increased following the droughts of 1971-73 and 1982-84 in the Sahelian regions. Finally, there are a few non-natives from three neighboring countries (Lobi from Burkina Faso, Bozo from Mali, Awlan from Ghana). Around CNP, there are five (05) provinces (Tehini, Bouna, Nassian, Dabakal and Kong). The main activities carried out around CNP are agriculture, livestock raising, most often with transhumant movements, agri-food processing and artisanal gold panning. The high rate of population growth combined with difficulties in accessing alternative sources of income for the populations, causes pressure on arable land, animal resources and forest products around and within CNP (OIPR, 2015; UNEP-GEF Volta Project, 2011).

**Methods of data collection**

***Sampling and survey techniques***

Our survey was carried out among local populations from September to November 2021. The socio-professional groups considered in villages were crop farmers, mixed farmers, homemakers, former hunters, traditional healers, notables, livestock breeders, and others (drivers, students, traders). Since hunting is illegal, the use of ‘former hunters’ is a locally conventional way to allow for uncontroversial dialogue with people that may, in fact, still hunt. Respondents were selected from twenty-three (23) villages bordering CNP (Figure 1). The choice of surveyed villages was based on the criteria of accessibility, proximity to CNP (villages located at less than or equal to 1 km to CNP), particularity of socio-cultural groups and security of the area (Atta et al., 2021).

This study combined a quantitative and qualitative approach given the nature of the information sought. Semi-structured interview guides and photo support sheets designed on the lion and its potential prey were used (Dickman, 2008). Twenty-three (23) focus group was carried out in the communities for a brief presentation of the project to the respondents followed by individual interviews (Koue Bi *et al.,* 2017). The service of an interpreter was used for translations into the main local languages during the surveys. We interviewed 307 respondents from the six main ethnic groups: Lobi, Koulango, Malinke, Dioula, Djimini, and Fulfulde.

***Questionnaire development***

The interviews covered socio-demographic variables such as province, village, ethnic groups, age, gender, religion and profession. Questions were organized into sets addressing Acceptance of lion reintroduction - Personal control - Perception of benefits of lion return - Perception of risks of lion return - Current management system. For the "Acceptance of reintroduction" group of variables, we have the wish of the lion to return, knowledge of the lion, previous coexistence with the lion, previous conflicts with the lion, and acceptance for future coexistence with the lions. The "Personal control" group of variables consists of people's involvement in participatory management and their ability to protect themselves from future lion attacks by taking control precautions. For the "Perceived benefits of lion return to CNP" group of variables, we have improved living conditions for people around CNP by carrying out socio-community works, ecotourism, recreational and educational potential, improved health of CNP and its ecosystem services, and the balance of benefits versus risks. The "Perceived risk of lion return to CNP" group of variables consists of future inconvenience of lion return, attacks on communities, attacks on domestic animals, contribution of lion return to increased human-wildlife conflict. Finally, the management system is measured with its current state, the ability of the manager to use appropriate techniques for the effective management of lions and conflicts related to lion returns, and to implement strategies for communication, awareness, and responsiveness to community concerns.

***Statistical analysis***

After tabulation, the data collected from the respondents were cleaned, processed, and compiled in a spreadsheet. Response frequencies (%) were determined for the variables measured (Mouzoun, 2014). After coding data, statistical analysis was performed using R 4.1.0 software (Core Team, 2020). The non-parametric chi-square test was done to assess the significance of differences in the degree of acceptance of the return of lions to CNP among ethnic groups and socio-professional categories. To identify the determinant factors for acceptance of the lion return, the generalized linear model (GLM) under the *nnet* package with binomial and multinomial distribution was used to analyze the groups of variables such as ‘’acceptance of lion reintroduction to CNP’’ (Moral et al., 2016). The explicative variables for identifying the determinants in the model were province, village, age group, gender, ethnicity, religion and profession. The explicative variables that were determinant for the responses provided by the respondents were identified. For all statistical analyses, the threshold of significance of the results is validated for probability values lower than 0.05. The results of these analyses were visualized using the *ggeffect* package with the plot function.

**Results**

***Sociodemographic characteristics of the respondents***

We surveyed 307 respondents consisting of 69% (n=212) men and 31% (n=95) women, aged 33-94 through 23 focus groups and one questionnaire by respondent. Our sample was composed of 61% (n=188) Muslims, 21% (n=65) Christians and 18% (n=54) Animists. A caveat is that traditional cultural practices are widely practiced in this region; each person is necessarily rooted in tradition irrespective of their religious affiliations. The ethnic groups and socio-professional distributions of the sample are summarized in Table 1. Our sample had significantly more respondents from the regionally dominant ethnic group, the Koulango (χ² = 31.92; Df = 5 and p-value <0.05), and significantly more respondents from the main profession, farmers (χ² = 36.71; Df = 7 and p-value <0.05).

***Acceptance of the reintroduction of the lion to CNP***

More than two thirds of the respondents were in favor of lion return to CNP (Table 2). The degree of acceptance varied significantly among the ethnic groups (Table 4). The Koulango were the most favorable ethnic group to lion return with 84% of responses of acceptance, followed by Dioula (P = 70%), Djimini (P = 65%), Malinké and Lobi, while Fulfulde were unanimously against CNP (P = 0%) (Figure 2).

Acceptance of lion reintroduction varied significantly between socio-professional categories but not at the level of gender or religion (Table 4). We note that categories of notables, traditional healers and other are totally in favor of the lion return to CNP with 100% of acceptance opinions, followed by former hunters, farmers, agro-pastoralists and homemakers, while livestock breeders are totally against to lions return with 0% of favorable responses (Figure 3). Table 2 presents the level of relationships with lions that existed at CNP. This include proportions of respondents living near CNP who have the lion knowledge, the rate of previous coexistence with lions, the estimated proportion of people who have been harmed by conflicts with lions in the past, and the willingness to coexist with future lions. Non-negligible rate of respondents confirmed to be involved in the current management of CNP they qualified participatory (Table 2). Table 3 presents results related to potential benefits and possible risks of lion return to CNP. Most important benefits perceived by the majority of respondents are the improvement of well-being conditions for people around CNP (89%; n=273), followed by ecotourism, recreational and educational potentialities, and CNP health and ecosystem services improvement. Main risks perceived by respondents toward lion return were the future inconvenient (35%; n=107), followed by lion attacks on communities, lion attacks on pets and livestock, and the contribution of lion return to the human-wildlife conflicts increasing. Finally, more than half of respondents (53%; n=163) thought that benefits higher than risks related to the lion return, and the majority (91%; n=279) agree taking own strategies to prevent future lion attacks (Table 3).

***Determinant factors for the acceptance of lion reintroduction to the CNP***

The identification of the socio-demographic factors determinant for the acceptance of the return of lions to CNP thank to the GLM shows the following results (Table 4).

The table 4 shows that ethnic group, profession and village of the respondents are significant determinants for the wish of lion return and other related variables (p-value < 0.001). Most of professions with farmers, former poachers and mix-farmers on top, are relatively in favor of lion return to CNP except the livestock breeders. All main ethnic groups surveyed except the Fulfulde were in favor of lion return to CNP. Respondents from all villages were globally in favor of lion return with some notices of disagree in the villages of Kokpingué, Koutouba, Sanguinari and Lambira where respondents from certain ethnic groups carrying out certain activities have experienced past conflicts with lions (Figure 4). Old and adult respondents got better knowledge of lions based on their past coexistence with this species in most of villages. Ethnic group, profession and village of the respondents were the same determinant factors for the current management system of CNP. Most of respondents from certain ethnic groups in some villages carrying out some activities felt that the current state of management was acceptable and could be improved. Majority of respondents expressed their confidence and believed that OIPR is able to manage effectively future lions and the related conflicts as well as taking into account the concerns from local populations (Table 2).

**Discussion**

This study provides a baseline for the potential reintroduction of lions and their sustainable conservation in the future. Given the main socioeconomic activities of the local populations are agriculture and livestock (OIPR, 2015; UNEP-GEF Volta Project, 2011), this category of stakeholders is important to consider for this study because it demonstrates their influence on the proposed lion reintroduction project at CNP. However, the perceptions of all occupational categories and ethnic groups are important to this study.

The reappearance and re-establishment of large carnivore populations in human-dominated landscapes create the need to understand how people react to the new presence of these animals (Zajac *et al*., 2012). Understanding the attitudes and behaviors of local communities toward the return of large carnivores to protected areas is critical to the success of reintroduction projects (Breitenmoser *et al*., 2001; Reading & Clark, 1996). Our study contributes to determining the feasibility of the potential reintroduction of lions to CNP. It focuses on the current thoughts and perceptions of local people and places local communities at the center of the management strategies and mechanisms of the potential lion reintroduction project. The lion is an emblematic species with very important ecological, economic and social roles currently missed in Côte d’Ivoire (Maddox, 2003; Sergio *et al*., 2008; Simberloff, 1998; Sogbohossou, 2006; Terborgh *et al*., 1999). This study will also inform the implementation of lion reintroduction and conservation projects elsewhere in West Africa.

We found that the majority of the local population would like to see lions returned to CNP, whereas opposition comes mainly from the Fulfulde out of concern for their livestock. Our results are similar to work conducted on endogenous Taiwanese attitudes toward the reintroduction of the clouded leopard into Tawushan Nature Reserve (Greenspan *et al*., 2020a; Greenspan *et al*., 2020b), and about the preference for increasing tiger population size in Chitwan National Park, Nepal (Carter *et al*., 2012). The overall low casualty rate due to human-wildlife conflict specifically related to lions is a factor in favor of accepting lions return to CNP. Another key factor is the familiarity of local communities with the species as good knowledge of the concerned species allows local people to weigh the relative risks and benefits, thereby promoting coexistence and community contribution to conservation. This is supported by Auster *et al*. (2020) who showed that high knowledge of the clouded leopard was correlated with positive attitudes of rural communities towards the reintroduction of animals. In addition, the majority of respondents felt that the return of lions would have benefits related to ecotourism, recreation and public education, among others. As showed by Zajac *et al*. (2012), this perception of benefits represents an asset to animal reintroduction initiatives that increases community acceptance and support (Greenspan *et al*., 2020a; Greenspan *et al*., 2020b). Community acceptance and support could be justified by business opportunities related to tourism (Auster *et al*., 2020) as it was the case for the reintroduction of the clouded leopard (*Neofelis nebulosa*) in the Tawushan Nature Reserve in Taiwan (Greenspan *et al*., 2020a; Greenspan et al., 2020a).

Across the globe, high levels of perceived risk (such as perceived conflict) can lead to negative attitudes among local residents regarding carnivore reintroduction (Fort *et al*., 2018; Ramesh *et al*., 2019). In general, even when there are positive feelings, negative public attitudes toward reintroduction projects may still exist. Opposition among some local residents may stem from both past conflicts with lions and concerns about the impacts of future carnivore reintroduction such as the risk of domestic animal predation and attacks on local populations (Greenspan *et al*., 2020a). In our case, some stakeholders, mainly livestock breeders opposed to lion return because of their experience (Figure 2). This is the case in Ohio Department of Natural Resources (USA) where risk perception strongly influences the level of acceptance to coexist with black bears (*Ursus americanus*) by people (Zajac *et al*., 2012). Even though livestock breeders constitute a minority group, they can determine most consequences, as pointed out by the Pareto principle (Pareto, 1967). The low proportion of respondents can potentially lead to project failure, as a small population of lions is relatively easy to eradicate with poison. It was the case in Michigan (USA) and Zimbabwe, where all reintroduced wolves and wild dogs (*Lycaon pictus*) were respectively poached after their release (Davies & du Toit, 2004; Kellert et al. 1996). This suggests that any long-term reintroduction planning must be based on awareness campaigns in order to have the support of all stakeholders. The project can only be effective if livestock depredation is very well mitigated, and that is only possible through improved animal husbandry practices (Bauer *et al*., 2010; Frank *et al*., 2004).

When local people and carnivores share the same living landscape, personal interactions can occur (Carter et al., 2012). CNP is a historic habitat where lions lived until the 2005s before disappearing (Bodendorfer *et al*., 2006; Red List, 2015). As a result, local populations around CNP have a high level of knowledge about lions, good past coexistence and reportedly a low level of past lion-related conflicts. These important parameters are determinants for respondents’ acceptance of lions return. Respondents with low knowledge who had experienced previous conflicts with lions perceived unbearable levels of risk; knowledge and experience are assets for reintroduction because it allows local people to weigh the relative risks and benefits, and improves future coexistence. This was demonstrated by the work of Auster *et al.* (2020) who showed that high knowledge of the clouded leopard is positively correlated with rural community attitudes towards reintroduction.

A criterion for reintroduction is that the factor leading to the initial disappearance must have changed. During the civil war, people invaded CNP but this is not anymore the case. IUCN guidelines recommend that species reintroduction projects should affect and be impacted by the interests of local people (IUCN & SSC, 2013). Socioeconomic and political factors must therefore be integrated into reintroduction projects. Like Auster *et al*. (2020) and Carter *et al*. (2012), we found a large proportion of respondents who believe that there will be potential post-reintroduction benefits such as ecotourism, recreation and public education, etc., compared to potential risks, which will allow to avoid frustration and disappointment by creating business opportunities for positive influencing local community attitudes.

According to Kansky *et al*. (2021), human-wildlife conflict should be defined as consisting of impacts that deal with direct interactions between humans and wildlife species (Young *et al.*, 2010), and conflicts between humans over how to manage wildlife impacts (Redpath *et al*., 2015). The willingness of communities to share the landscape and tolerate possible costs from wildlife while ensuring sustainable wildlife populations is critical for the success of human-wildlife coexistence (Crespin and Simonetti, 2019; Redpath *et al.,* 2018). The tolerance is therefore as the willingness of an individual to absorb the extra potential or actual costs of living with wildlife (Kansky *et al.*, 2016). Wildlife reintroduction acceptance or tolerance is not just about balancing costs and benefits but include historical, political and religious dimensions (Bauer *et al*., 2022); for example perceptions might change as reintroduced lions shift from “God’s species to government’s species, and rapid, widespread changes in public perceptions and behaviors have the potential to influence conservation outcomes (Niemiec *et al*., 2022). Many other drivers motivate perceptions of local populations. Around CNP, we found that age, ethnicity, profession and previous exposure were particularly important. Current participatory, consensus-based decisions provide just and fair means to overcome challenges in human-wildlife conflicts and coexistence (Treves and Santiago-Avila, 2020).

Initiatives to reintroduce large carnivores into human-dominated environments require prior understanding of the attitudes and behaviors of local communities (Zajac *et al*., 2012). Our results show that the various stakeholders and socioeconomic activities around CNP will have impacts on the reintroduced lions. In general, anthropogenic factors and particularly human-wildlife conflicts with lions, are most often the cause of reintroduction failure. This is the case in Zimbabwe where wild dogs (*Lycaon pictus*) reintroduced in the Matusadona National Park in the northwest were poached after their release (Davies & du Toit, 2004). Our observations are consistent with previous studies that demonstrate the negative effects of socioeconomic activities of local populations on large carnivores in protected areas. These include direct killing, reduction in habitat quality and prey availability, limitation of usable space, and activity patterns (Becker *et al*., 2013; Boydston et al., 2003; Kolowski & Holekamp, 2009; Kolowski et al., 2007; Ripple *et al*., 2015; Rosenblatt *et al*., 2014; Schuette et al., 2013; Watson *et al*., 2014; Watson *et al*., 2013). Community awareness and greater involvement of local communities are importanr to limit human-wildlife conflicts that are a major source of post-reintroduction failures (Davies & du Toit, 2004; Kellert *et al.*, 1996). Therefore, lion reintroduction at CNP should be participatory and accompanied by projects that generate benefits capable of offsetting potential risks. The reintroduction of lions to CNP crucially depends on the support of local populations and our results show a favorable starting point but it is important to consider and monitor perceptions differentiated by socio-economic groups.

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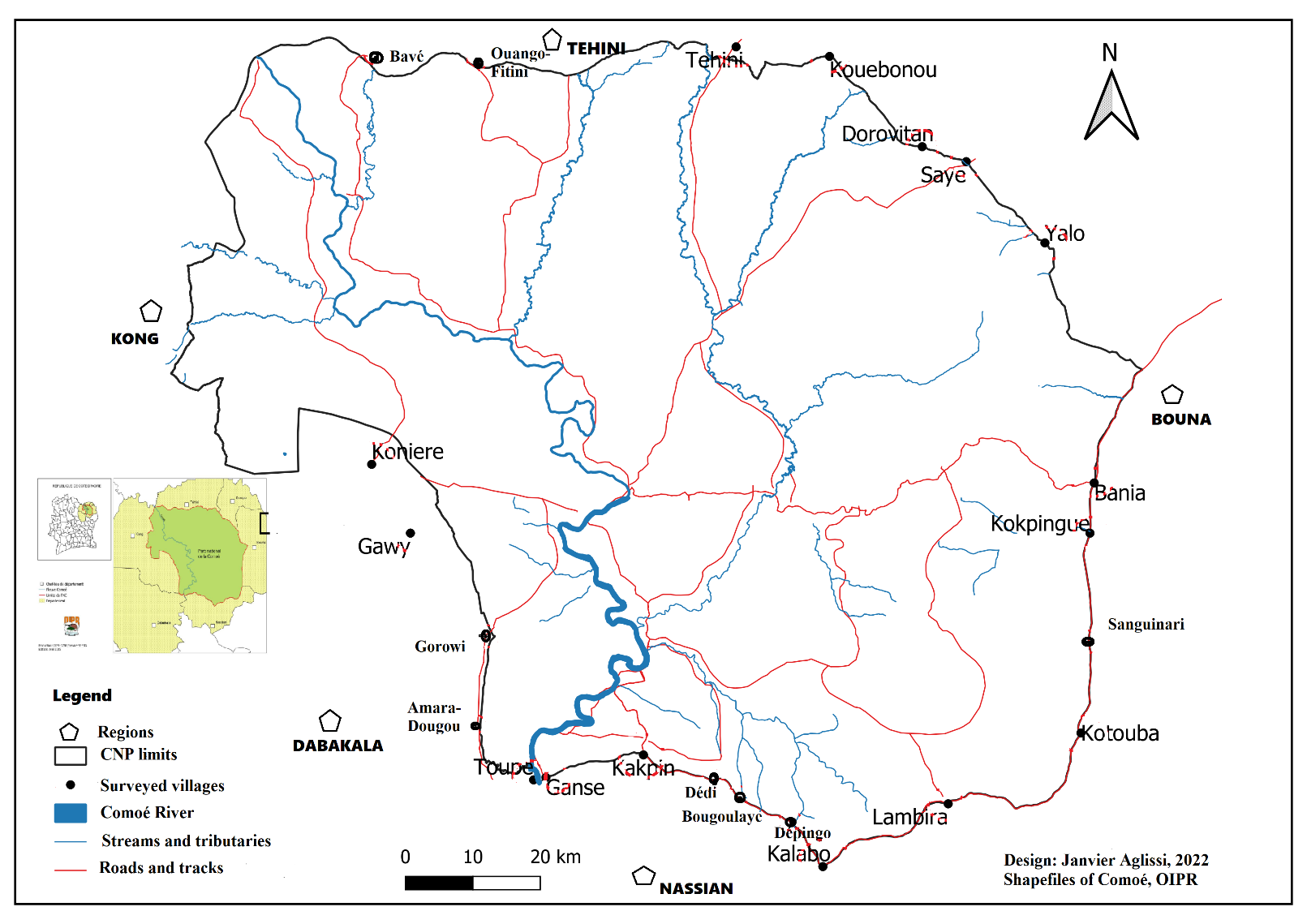


Figure 1: Geographic location of CNP and distribution of surveyed villages

Figure 2: Degree of acceptance overall and by ethnic group of the return of lions to the CNP

Figure 3: Acceptance of the lion return to CNP by professions

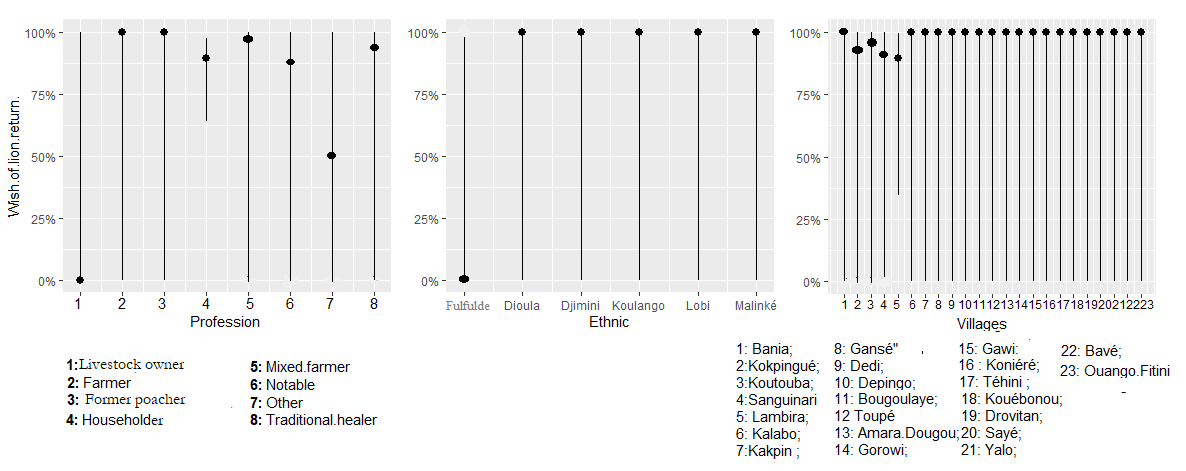


Figure 4: Inclusive factors in acceptance of lion return to CNP

Table 1: Ethnic groups and socio-professional composition of respondents with number of respondents in a given ethnic group or profession, and relative percentages.

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Terms | n | % |
| Ethnic groups | Koulango | 153 | 49,83 |
| Malinké | 57 | 18,57 |
| Lobi | 40 | 13,03 |
| Djimini | 23 | 7,50 |
| Dioula | 20 | 6,51 |
| Fulfulde | 14 | 4,56 |
| Total | | 307 | 100,00 |
| Profession | Farmers | 150 | 48,86 |
| Homemakers | 38 | 12,38 |
| Mix-farmers | 36 | 11,73 |
| Former poachers | 22 | 07,16 |
| Traditional healers | 20 | 06,51 |
| Notables | 17 | 05,54 |
| Livestock breeders | 14 | 04,56 |
| Other (students, drivers, traders) | 10 | 03,26 |
| Total | | 307 | 100,00 |

Table 2: Number of respondents (n=307) and answer percentages (%) for parameters related to with of lion return, past relations with lions, current management system of the CNP, and future management of lions

|  |  |  |
| --- | --- | --- |
|  | Rates of response (%) | |
| Terms | Yes | No |
| Wish of lion return | 71 | 29 |
| **Past relationships with lions** |  |  |
| Knowledge of lion | 96 | 4 |
| Past coexistence with lions | 81 | 19 |
| Past conflicts with lions | 16 | 84 |
| Acceptance for future cohabitation with lions | 81 | 19 |
| **Current management system** |  |  |
| Participatory management | 42 | 58 |
| Acceptable management | 66 | - |
| Good management | 17 | - |
| Bad management | 17 | - |
| **Management of future lions** |  |  |
| OIPR can effectively manage future lions | 80 | 20 |
| OIPR can effectively manage conflicts related to future lions | 80 | 20 |
| OIPR can consider local people concerns through the management strategies ‘Mesures riveraines’’ | 81 | 19 |

Table 3: Number of respondents (n=307) and answer percentages (%) for parameters related to the potential benefits and risks of returning lions to the CNP.

|  |  |  |
| --- | --- | --- |
|  | Rates of response (%) | |
| Terms | Yes | Yes |
| **Benefits related to the lion return to the CNP perceived** | **Yes** | **Yes** |
| Improvement of well-being conditions for riparian people | 89 | 11 |
| Ecotourism, recreational and educational potentialities | 86 | 14 |
| CNP health and ecosystem services improvement | 84 | 16 |
| **Risks related to the lion return to the CNP perceived** | **Yes** | **No** |
| Future inconvenient related to the lion return | 35 | 65 |
| Attacks by lions on communities | 32 | 68 |
| Attacks by lions on pets and livestock | 30 | 70 |
| Contribution to the human-wildlife conflicts increasing | 33 | 67 |
| Ability to protect themselves from future attacks of lion by own precautions | 91 | 09 |
| **Balance between perceived benefits and risks** | **Yes** | **No** |
| Benefits higher than risks related to the lion return | 53 | - |
| Benefits equal to risks related to the lion return | 33 | - |
| Benefits lower than risks related to the lion return | 14 | - |

Table 4: Effect of socio-demographic parameters on acceptance criteria for lions in the CNP with sources of variation, likelihood ratio (LR Chisq), degree of freedom (Df) and test probability value (P ( >Chisq).

|  |  |  |  |
| --- | --- | --- | --- |
| Source of variation | LR Chisq | Df | Pr (>Chisq) |
| **Wish of lion return** | | | |
| Ethnic group | 31.729 | 4 | <0.001 |
| Profession | 85.826 | 5 | <0.001 |
| Village | 235.07 | 21 | <0.001 |
| **Knowledge of lion** | | | |
| Age class | 36.72 | 2 | <0.001 |
| Ethnic group | 11.87 | 5 | 0.037 |
| **Past coexistence with lions** | | | |
| Village | 43.47 | 21 | 0.003 |
| Profession | 19.51 | 6 | 0.003 |
| **Past conflicts with lions** | | | |
| Village | 114.33 | 21 | <0.001 |
| Ethnic group | 12.55 | 4 | 0.014 |
| Profession | 39.13 | 5 | <0.001 |
| **Current management system** |  |  |  |
| Village | 22.32 | 8 | 0.004 |
| Ethnic group | 18.22 | 10 | 0.051 |
| Profession | 41.26 | 14 | <0.001 |