

Human-Animal Conflict Reasonable Solutions Based on National Condition in China

Yuxin Shan *

Department of Shanghai SouthWest Middle School International Division, Shanghai, China

* Corresponding Author Email: 631401100114@mails.cqjtu.edu.cn

Abstract. This paper analyzes the current situation of human-animal conflict in China, adopts the research methods of investigation and literature research, and finally obtains the results that are specific to individual cases. This paper analyzes the conflict between *Elephas maximus* and human beings in Xishuangbanna, and the disturbance brought by birds to residents' lives in Shanghai, and discusses the causes and status quo of these phenomena respectively. In the second half of this paper discuss the solutions to the conflict between *Elephas maximus* and humans in Xishuangbanna and the disturbance caused by birds in Shanghai. At the same time, this paper also discusses the idea of the causes of the current situation of human-animal conflict in China, and the prospect of future solutions to the human-animal conflict. Overall, the purpose of this paper is to provide some references for solving the problem of human-animal conflict and to raise public awareness of peaceful coexistence with wild animals.

Keywords: Human-animal conflict; *Elephas maximus*; the relationship between birds; animals; humans.

1. Introduction

China is the second most populous country in the world and one of the countries with very rich species resources. In China, there are 673 mammals, 1329 birds, 435 amphibians, and 464 reptiles [1]. The problem of human-animal conflict has always existed in China, and it has become more and more serious. In China, people's awareness of protecting animals and living peacefully with animals is not strong, and relevant laws are not perfect.

Human-animal conflict refers to harm to human rights, including poverty damage (livestock and crops and other personal poverty), a threat to human life safety, and the negative influence on animals' habitats, food resources, and living rights created by humans [2]. As a result, not only humans are affected by the human-animal conflict, but the animals are persecuted as well [3]. Human-animal conflict can be divided into two main types, human-wildlife conflict and human-city animal conflict. In China, growing urban development has come into conflict with animals' natural habitats. The built-up area of China reached 62,420.530 square kilometers on 12-01-2021. In the same year, China's forest area reached 2200000 square kilometers. (Including primary forests and human afforestation) While the area of the city is growing year by year, the area of the primary forest and the ecosystem are threatened, such as timber exploitation and arable land exploitation [4-5]. In modern cities such as Shanghai, the limited area is scrambled by urban green land and building construction [6]. In recent years, the expansion of roads has led to the demolition of many green areas, and unprofessional garden teams have destroyed green areas in residential areas and even cut down trees.

These phenomena are caused by a conflict between human settlement and animal habitat. In China, there is a lot of attention paid to human-animal conflicts in certain areas, such as the conflict between *Elephas maximus* and residents in Xishuangbanna. In other cities, the problems caused by animals and people have not received much attention, and the number of relevant studies has been limited. Therefore, this paper will take the *Elephas maximus* in Xishuangbanna and the birds in Shanghai as case studies, and show a successful case of resolving the conflict between humans and animals in Shanghai.

2. Case Study

2.1. The conflict between wild *Elephas maximus* in Xishuangbanna Dai Autonomous Prefectures

The *Elephas maximus* in Xishuangbanna is a kind of terrestrial herbivorous mammal with scallion. Its main habitat is distributed in local forests and jungles, and its activity range includes rivers or valleys below 1000 meters above sea level. The *Elephas maximus* is also a priority-protected wild animal in China [7]. The diet of wild *Elephas maximus* includes a variety of wild plants and some crops such as rice, corn, plantains, etc. [8]. By 2020, the forest coverage rate of Xishuangbanna will be 81.34%, including afforestation and primary forest (data from the website of the Chinese government). However, the lack of suitable habitat for *Elephas maximus* is being destroyed and fragmented year by year. The main reasons for the loss of *Elephas maximus* habitat are climate change and loss of primary forest area. As a result, current *Elephas maximus* habitats are separated into small pieces. To get enough food and space for living, the *Elephas maximus* need to migrate between these separated habitats. According to the record in 2021 (Data from PengPai news), the longest migration distance was more than 140 kilometers. During *Elephas maximus*'s migration process, they go through villages, cities, and roads. When the *Elephas maximus* pass through difficult obstacles, they continue to move forward by destroying these man-made structures. When passing through the fields, the *Elephas maximus* will eat some of the crops, or trample on the crops as they pass through the fields, resulting in economic losses for the farmers.

There are also frequent incidents of elephants killing people during migration. Since 1991, almost every year there have been records of wild *Elephas maximus* wounding people, the most common being trampled by elephants to serious injury or even death. According to incomplete statistics, the number of casualties caused by *Elephas maximus* entering human settlements since 1991 is about 200. The human-animal conflict in Xishuangbanna not only brought great harm to human beings but also caused great survival pressure to *Elephas maximus*. *Elephas maximus* are timid, alert, and aggressive. The loss of habitat area increases their chances of contact with humans, and lights, cars, and noise in cities put wild *Elephas maximus* under a lot of mental stress [8]. Humans sometimes hunt and injure *Elephas maximus* and their young. Studies have shown that *Elephas maximus* has a memory and can remember up to 100 words and phrases [9]. After a trauma, such as the loss of a female calf, *Elephas maximus* can develop Post Traumatic Stress Disorder (PTSD), which can have a severe impact on their mental health [10].

According to a survey conducted in 2022, 68.1 percent of 182 Xishuangbanna Menghai-Pu'er L.Achang residents believe that Asian elephants should be completely controlled. Those who were strongly in favor of the construction of control zones accounted for 53.2% and 38.3%, respectively [11]. The ecological corridor bridge built to connect the fragmented habitat of *Elephas maximus* was one of the earlier proposed solutions to the problem of human-animal conflict. According to another survey conducted in 2007-2008, the survey of 196 households living in the covered Bridges shows that the number of people willing to conditionally support the construction of covered Bridges accounts for 80.61% [12]. In short, the Xishuangbanna people have a strong intention to solve the human-animal conflict, but the problem is that they cannot solve the problem of the habitat reduction of *Elephas maximus* from the root.

2.2. The Conflict between bird and human in Shanghai

Since 2000, about 517 species of birds have been recorded in Shanghai. (Data from PengPai News) The most common species of birds include sparrows, light-vented bulbul, spotted dove, blackbird, etc. Due to the generally small size of these common birds, Shanghai residents usually ignore the presence of this urban animal. However, residents complained about the problems caused by these birds many times. In neighborhoods, Birds often nest in the vents of old residential buildings. Because the bird's nest is mostly combustible materials such as tree branches and fluff, coupled with the relatively high temperature of the ventilation duct entrance, it is easy to cause fire. After the bird's

nest blocks the ventilation pipe, the air pressure in the pipe rises, which is easy to break. To solve the problem, people usually call an expert team to remove the bird's nest. However, there are often eggs or baby birds in the nest. During the removal process, these eggs and baby birds are probably damaged. Sometimes the eggs will be directly thrown, and the baby birds will be killed. In addition to this, birds often nest on telephone poles and power pylons. This not only causes hidden dangers to the safety of surrounding residents but also poses a great threat to the lives of the birds themselves.

According to conversations with citizens, they also reported that many birds caused them many troubles. For example, bird feces will fall on cars parked under trees, and bird feces will cause a certain degree of damage to the car paint, which is difficult to clean up.

The virus carried by birds is also a serious threat to human life. For example, one of the viruses which is carried by birds is LPAI. This kind of virus can be transmitted both directly and indirectly to wild animals, wild birds, domestic animals, and humans. LPAI can also mutate into subtypes H5 and H7, which the morbidity and mortality in Galliformes are high [13]. Migratory birds can accelerate the spread of the avian influenza virus, and Chongming Island in Shanghai is a stop for many migratory birds, with more than 25 species of 1% migratory birds (Figure 1).

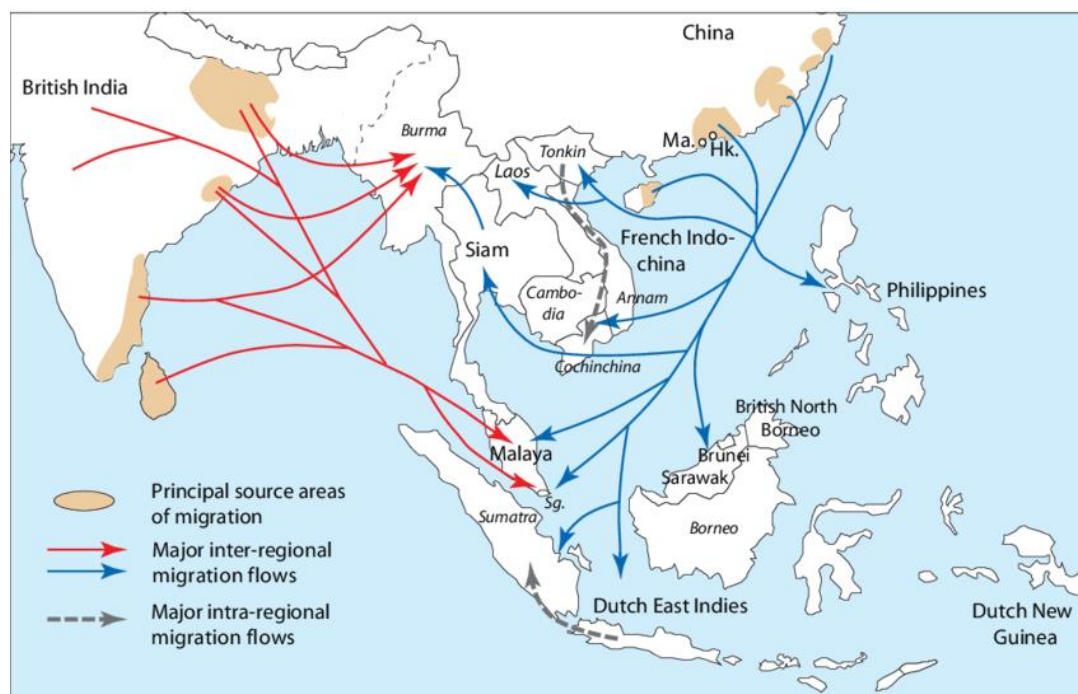


Figure 1. The migration system of Southeast Asia during the colonial era: Significant migration flows from 1870 to 1940 [14].

2.3. Raccoon dog in Shanghai: An example of harmony between humans and animals

Raccoon dog is a kind of carnivorous animal found in East Asian countries. In Shanghai, the raccoon dog has become one of the city animals that live depending on humans. Raccoon dogs are common in Shanghai Songjiang Division, they often live in rockery located in the neighborhoods. Raccoon dog's habitats are usually close to water sources.

In 2020, an event in which a raccoon dog hurt a human was reported in the news. This accidental incident was caused by the mass feeding of raccoon dogs by residents of the housing estate. Large-scale feeding has overpopulated the housing estate with raccoon dogs. Residents feed these wild animals out of their concern and kindness, which is a good sense of peace with animals, but it has caused bad consequences. The raccoon dog's diet includes earthworms, beetles, small fish, roots, and fruits of plants. Meanwhile, Shanghai Forestry Bureau. "No raccoon dog feeding" signs have been posted, and the overabundance of raccoon dogs in housing estates has been systematically captured, and they help them return to the wild. As a result, raccoon dogs and residents in Shanghai have kept a balance in this huge city since 2020[15].

3. Overall problems and causes

3.1. For animals

In general, the damage received by animals is more serious than the damage to humans. The current situation in China is not positive enough for most animals, especially for those animals in danger. *Elephas maximus* which is mentioned previously is a typical example. The most obvious change is the whole *Elephas maximus* habitat's decrease. Other problems faced by animals in human-animal conflict include physical and mental health damage, life safety threats, living resources, etc. The main cause is Animals' habitat is affected by human.

3.2. For human

For humans, in most cases of human-animal conflict, humans receive slightly less threat to life than animals. Most problems focus on damage to property, personal safety threats, and quality of life decrease. Considering that humans are capable of building more facilities to prevent human-animal conflict, the main causes of human-animal conflict for humans are the awareness of protecting animal rights, the right to equality in life, and living peacefully with animals is still weak.

4. Solutions

Xishuangbanna, as a biodiversity functional reserve and a key ecological functional area in China, is now facing a trend of declining biodiversity and decreasing and fragmented wildlife habitats[16]. The dwindling habitat makes the conflict between man and *Elephas maximus* more and more intense. As a result, the solutions to solve the problem are necessary.

4.1. The improvement of ecological corridor bridge construction

The project of the ecological corridor bridge has been begun since the early 21st century. Ecological corridors can be divided into key corridors, potential corridors, optimized corridors, and river corridors. By 2022, the total length of ecological corridors has reached 910.32 km (41), of which the length of potential corridors and key corridors are 631.73 km and 278.59 km, respectively(Figure 2)[17].

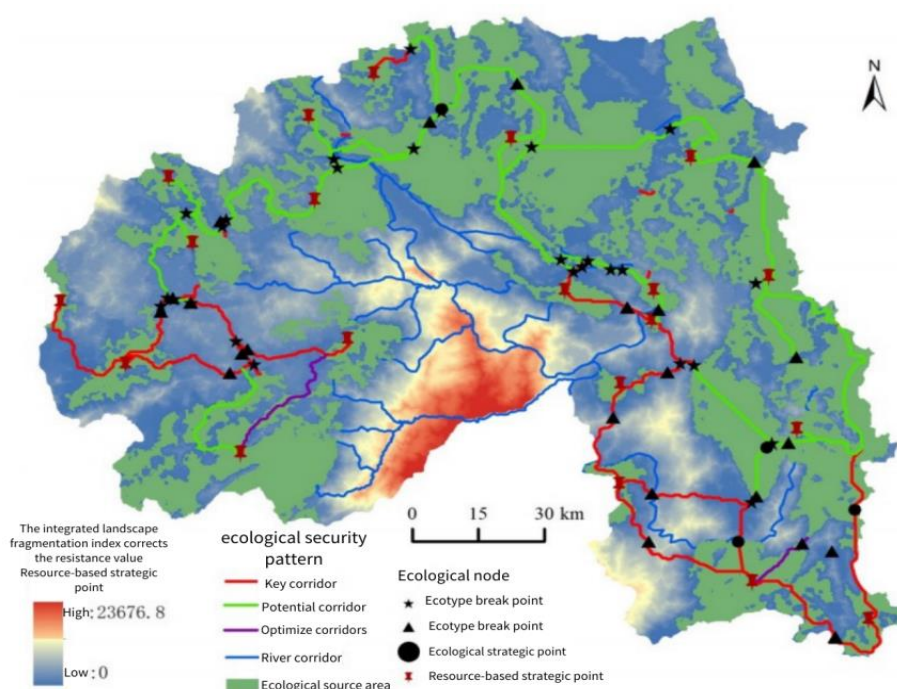


Figure 2. Construction of landscape ecological security spatial pattern in Xishuangbanna[17].

Although the current corridor construction connects adjacent animal habitats, the number is still small, especially the optimization corridor. In addition, some corridors are located close to villages, and *Elephas maximus* passing through the corridors are easy to contact with villagers, resulting in conflicts. Subsequently, it is suggested to speed up the construction speed and number of key corridors, and gradually transfer potential corridors to key corridors or optimize them. At the same time, local governments can take advantage of the existing river corridor resources and extend tributaries to connect separated habitats on both water and land.

4.2. The construction of animal-ejector lights

In addition, it is recommended to install animal-ejector lights at the edge of the village. At night, *Elephas maximus* tends to actively avoid areas with high light intensity. Therefore, animal-ejector lights can take advantage of this feature to avoid the effect of wild *Elephas maximus* approaching the village. The frequency of the light flickering was randomized to the intensity of the light, and the color of the light was set to red, orange, and yellow, which prevented the elephants from approaching the village better by simulating the color of the flame. Finally, using satellite, monitoring, and other data, real-time recording of the *Elephas maximus* activity track. After collecting enough data, a system for predicting the movement of elephants can be developed. The real-time light intensity, real-time location of the elephant population, weather conditions, and geographical characteristics are used to make accurate predictions, to interfere with the possible behavior of the elephant population entering human habitation, such as the use of sirens, drone guidance, and other devices that do not cause real harm to the *Elephas maximus*.

4.3. Methods to solve the problems caused by birds in Shanghai

For the various problems caused by birds in Shanghai, it is recommended to use some low-cost tools to solve the problem. In response to the phenomenon of birds nesting in the ventilation duct, residents can install special barbed wire to prevent birds from entering the ventilation duct. In response to the phenomenon of birds' feces smudging cars that park under trees, residents can choose to park their cars in underground garages. The government can also build more carport for residents to use. In response to the avian influenza problem, the government should continue to enforce the policy of closing the live poultry trade. For occasional cases of human infection with avian influenza, hospitals and the Centers for Disease Control and Prevention should isolate patients and trace the route of virus infection.

In general, close contact between birds and humans is unavoidable in Shanghai. Many birds have also gradually adapted to urban life, so humans must adapt to living with birds on the premise of preventing human-animal conflict.

5. Thoughts and prospects on the current situation of human-animal conflict

In China, with the worsening of human-animal conflict, attention to the issue is also growing. The rapid development of Chinese cities and towns is often accompanied by irrational planning. It is not uncommon for buildings to be constructed using wildlife habitats, but incomplete planning results in incomplete construction. Many ecologically sound areas have been turned into wastelands. In addition, most citizens do not have a comprehensive understanding of wildlife. In the Chinese education system, there is very little content on how to live with animals, and how to know and understand animals. The lack of popular science of wildlife knowledge leads to people's misunderstanding of wildlife. Citizens are prone to fear, disgust, and antipathy towards wild animals. Residents should recognize that animals also have the right to life. When human-animal conflict occurs, human beings should reflect on whether it is because they have caused the problem, instead of blaming animals for affecting human development and life. In recent years, with the improvement of China's education level, people have begun to realize that humans and animals should live together peacefully and equally. Young people, in particular, volunteer to organize public welfare activities to

help animals in cities live better and provide better habitats for wild animals. The call for improving the animal protection law, which is conducive to easing the conflict between humans and animals, is also getting stronger and stronger. Although the problem of human-animal conflict in China is still very serious at present, there is a trend of improvement.

6. Conclusion

Based on the relationship between humans and animals in China and the current situation of rapid development, it is very difficult to fundamentally solve the problem of human-animal conflict. As a large agricultural country, China has a large demand for land suitable for farming, which has also led to forest degradation and increased contact between wild animals and humans, thus exacerbating human-animal conflicts. However China's economic structure cannot be changed in the short term, so some indirect methods can be used to mitigate human-animal conflicts. For example, for the wild *Elephas maximus* in Xishuangbanna, the construction of ecological corridors should be strengthened to raise residents' awareness of the harmonious relationship between humans and animals. As for the troubles caused by urban birds in Shanghai, some simple facilities can be used to solve the problem, and the government should strengthen the management of poultry trading. In short, these methods can alleviate the problem of human-animal conflict to a certain extent.

References

- [1] Xing, Y., Zhang, C., Fan, E., & Zhao, Y. (2016). Freshwater fishes of China: species richness, endemism, threatened species and conservation. *Diversity and Distributions*, 22(3), 358-370.
- [2] Su Kaiwen, Ren Jie, Huang Yuan, Yang Jie, & Wen Yali. (2022). Current situation, challenges, and suggestions of man-animal conflict management in nature-protected areas. *Journal of Wildlife Science*.
- [3] Human-Animal Conflict Avoidance System DEEPAK KUMAR RAY¹, AAYUSHI SINGH², DIPANSHI SRIVASTAVA³, NIDHI JAISWAL⁴ 1, 2, 3, 4 Bharati Vidyapeeth (Deemed to be University) College of Engineering, Pune
- [4] Data from Chinese Ministry of Housing and Urban-Rural Development
- [5] Data from www.chinanews.com
- [6] Liu N. (2010). Current situation and prospect: Reflections on animal protection legislation in China. *Journal of China University of Geosciences: Social Sciences Edition*, 10(2), 32-37.
- [7] FENG Limin, ZHANG Li. Habitat Selection by Asian Elephant (*Elephas maximus*) in Xishuangbanna, Yunnan, China[J].
- [8] Guo Y L, Zhang L, & Dong Y H. (2006). Foraging behavior of wild Asian elephants in Xishuangbanna. *Journal of Animal Science*, 26(1), 54.
- [9] Shoshani, J., & Eisenberg, J. F. (1982). *Elephas maximus*. *Mammalian species*, (182), 1-8.
- [10] Rizzolo, J. B., & Bradshaw, G. A. (2016). Prevalence and patterns of complex PTSD in Asian elephants (*Elephas maximus*).
- [11] Liu Jiaqi, Wang Man, Zhu Gaofan, Li Zhongyuan, Ma Jie, Su Rui,... & Chen Mingyong. (2022). Cognition and attitude of villagers towards controlled conservation of wild Asian elephants in Xishuangbanna. *Chinese Journal of Wildlife* (2310-1490), 43(2)
- [12] Li Zhengling, Chen Mingyong, Wu Zhaolu, Wang Qian, & Dong Yonghua. (2009). The cognition and attitude of villagers in the Xishuangbanna community towards the construction of the Asian elephant protection corridor. *Chinese Journal of Applied Ecology*, (6), 1483-1487.
- [13] Verhagen, J. H., Fouchier, R. A., & Lewis, N. (2021). Highly pathogenic avian influenza viruses at the wild-domestic bird interface in Europe: Future directions for research and surveillance. *Viruses*, 13(2), 212.
- [14] Global Markets – Local Consequences: The Migration of Labour in Southeast Asia Since the Mid-Nineteenth Century

- [15] ‘Ten raccoon dogs have been trapped and gradually released into the wild after a clash between humans and raccoon dogs in a community in Shanghai’ reported by PenPai News, Hui Zhang
- [16] Dong W G, & Guo X G. (2008). Research status and conservation of species diversity in Yunnan. China Science and Technology Information, (14), 19-21.
- [17] Shen Run, Shi Zhengtao, He Guangxiong, Lin Yanhua, & Xu Rui. (2022). Construction and optimization of ecological security pattern in Xishuangbanna based on landscape fragmentation index. Tropical Geography, 42(8), 1363-1375.