

# Threats Faced by Red-crowned Cranes and Solutions

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**Abstract.** With the development of the times, more and more people are destroying the natural ecological environment and hunting wild animals for various purposes, such as social economic and agricultural development, personal desire for money and so on. One victim of human bad conduct is the red-crowned crane, as an example. Red-crowned cranes are now suffering from many threats that have led to a sharp decline in its population. If humans do not do something in time, the number of red-crowned cranes will gradually decrease until they become extinct. Therefore, this article will mainly focus on analyzing the threats faced by red-crowned cranes and the solutions that can help change the situation of red-crowned cranes which includes four threats and four solutions or methods that can help to protect the Whooping Crane. In order to better protect red-crowned cranes, increase their numbers, and safeguard some ecological environments while aiding red-crowned cranes, such as wetlands. This article is helpful for people to be able to understand the issues that red-crowned cranes face and to know the solutions.

**Keywords:** Threats; solutions; red-crowned crane; wetlands.

## 1. Introduction

### 1.1. Red-crowned Cranes

The red-crowned cranes breed in vast wetlands and reside in low-lying waters with enough reed cover. They are omnivores, and they consume a range of diets, including both plants and animals [1]. Seasonal migration is the main red-crowned crane behavior. During the spring and summer, migratory populations of red-crowned cranes breed in eastern Russia, northeastern China, and occasionally northeastern Mongolia. In the fall, they go in sizable numbers to east-central China and Korea to spend the winter [2]. The Red-crowned Crane is a species of crane that is globally endangered and is categorized as "endangered" on the Red List of the International Union for Conservation of Nature [1, 2], because it has the second-smallest population of all crane species.

### 1.2. Wetlands

A wetland is a place where water, whether salty, fresh, or somewhere in between, continuously or sometimes covers the ground [3]. The largest wetland that is protected in the world is called Llanos de Moxos, and it is located in Bolivia, with over 17 million acres, it is almost as big as North Dakota [3]. In addition to lakes, rivers, marshes, bogs, mangroves, mudflats, swamps, and floodplains, there are several more forms of wetlands. A diversity of freshwater systems are typically present in the majority of large wetland environments [3]. The wetlands contain so many benefits. For example, they help improve the quality of water, control erosion and supply a huge amount of water. Also, they offer special habitats for a variety of uncommon waterfowl, including the red-crowned crane [4].

### 1.3. The Relationship Between Red-crowned Cranes And Wetlands

The number of red-crowned cranes has drastically decreased in recent years as a result of human greed, over-exploitation of wetlands, and a lack of concern for their conservation. According to the data, there are only about 1830 adult red-crowned cranes in the world [5].

According to the research, so many negative actions did by people and natural phenomena threaten the world's surviving wetlands. According to the particular statistics, 35% of the world's wetlands were lost between 1970 and 2015, and since 2000, the pace of loss has been rising annually [6].

## **2. Problems The Red-crowned Cranes Face**

### **2.1. Loss Of Wetlands**

Wetlands are the roosting, breeding and wintering grounds of the Whooping Crane, so their loss is the first and most serious problem leading to their decline. There are plenty of serious impacts that contribute to the loss of wetlands such as human activities and climate change.

#### **2.1.1. Human Activities**

In order to develop agriculture and the economy, more and more places need to be planted and built for everyday needs, such as homes and places to support economic activities. At first, people just reclaimed the undeveloped lands. However, with the increasing population, those lands were deficient for holding all the people and the rapid developments. Thus, people are looking at other places where creatures already exist and live, but without humans, such as wetlands. People drained the water from the wetlands and filled the wetlands with soil to make the wetland to be more stable agricultural lands [7]. After that, people started to grow different plants on those lands. Rice fields and agricultural fields on river floodplain soils are two instances of the negative usage of the wetlands [8]. In addition, people built many residential buildings, which caused a lot of wetlands to be destroyed.

#### **2.1.2. Climate Change**

Because of the greenhouse effect, the temperature of the whole Earth is keeping on increasing. The increase in temperature may lead to the loss of wetland water through evaporation. In addition, rising temperatures also affect the cycling of carbon, nitrogen and phosphorus and the water quality of wetlands [9]. Due to rising sea levels, shallow coastal waters may be inundated by seawater and wetlands may become open waters.

### **2.2. Human Developments**

Pollution, such as water pollution, is one of the negative effects of human progress and is defined as the presence of chemical and biological materials or causes that result in a condition impairment of a particular water body [10]. Two types of water contamination exist: the point source pollution, which comes from sources that can be easily identified, like the pipe industry and sewage treatment plants, and non-point source pollution, which is difficult to control and does not come from a single identifiable source, like pesticides, fertilizers, and industrial wastes [11]. Due to the development of agriculture, many parts of the wetlands are used for agricultural cultivation. To grow better crops, farmers will use pesticides in the process of planting. Usually, every time you plant a crop, there will be a lot of bugs that eat the crop. In this way, pesticides are also essential to agriculture. However, pesticides and insecticides not only erode soil but also gradually seep into the ground and affect groundwater [11]. Due to the fluidity of the water, the polluted groundwater will combine with the groundwater in other parts of the wetland, such as where the red-crowned cranes live. In this way, a large number of plants will be negatively affected, because a large part of the water for their growth is groundwater. Additionally, groundwater will seep into ponds, lakes, and perhaps seas, where it will contaminate the water that red-crowned cranes utilize and dwell in. In this way, the red-crowned crane's life will be in danger.

### **2.3. Over-hunting**

Over-hunting is also one of the serious problems that the red-crowned cranes face. In earlier times, many individuals engaged in extensive hunting of red-crowned cranes, particularly in Japan, due to the enormous profits generated by their stunning feathers. Moreover, the feathers could be used in the production of different types of fashion accessories, such as hats. According to the information found through the Internet, the lowest price of a short, about forty-four centimeters, feather of the red-crowned cranes is about forty-three dollars now, let alone other longer feathers and fashion accessories. As time went on, the number of hunters increased gradually and the amount of red-

crowned cranes decreased dramatically. Even though there is a clear law that red-crowned cranes cannot be hunted, due to the existence of the black market, which is a way of getting around government controls, many people still secretly hunt red-crowned cranes and sell their feathers on the black market way of getting around government controls [12].

## **2.4. Lacking Money**

It is preferable for humans to create reserves for the red-crowned cranes to live in order to better safeguard them. But giving reserves comes at such a great price. The reserve must be situated in a wetland and have a sizable enough area to support red-crowned cranes in their natural habitat. Also, because the red-crowned cranes are omnivores that feed on both animals and plants, plenty of food, such as invertebrates, fish, small aquatic invertebrates and grasses should be prepared. Moreover, in order to take better care of the red-crowned cranes, a large number of workers need to be employed. Furthermore, many facilities should be provided. For example, there can be a huge number of infrared cameras which have night vision and can be used to monitor conditions in the reserve and some patrol boats or patrol cars to patrol the reserve and find the problems in the corners which cannot be seen through the cameras. Also, the electronic boundary tablet is another cutting-edge new technology device that can use the Internet to gather vital information like temperature and humidity in the reserve before sending the data back to the data cloud, which the staff can use to create better statistics and identify reserve conditions. In this case, the cost of building a reserve is so high, and there is not that much money that can be paid.

## **3. Solutions To Issues And Ways To Improve Red-crowned Crane Situation**

After learning about the red-crowned cranes' issues, there are more methods to assist the red-crowned cranes.

### **3.1. Irrigation**

One of the best methods for growing plants has always been irrigation, which has been utilized for at least 4,000 years. The requirement for irrigated croplands has increased significantly due to agricultural expansion, which necessitates the usage of additional water. Additionally, the increased consequences on the associated wetlands may result from this high water demand [13].

What volume of water may be drained? What is the wetland ecosystems' resilience like? What is the maximum amount of water that may be withdrawn while still protecting the environment? The issues generally revolve around resilience, which is the capacity of wetland systems to withstand and recover from a stressor. The resilience of the wetlands depends on a variety of elements, including the kind of wetland and the degree of natural and anthropogenic stress that is currently present. However, individuals just drain vast amounts of water to suit agricultural demands without considering resilience. Due to people's disregard for resiliency, wetlands are slowly being destroyed [13].

Irrigation would indeed have some negative impacts on wetland ecosystems, but irrigation is also helpful to wetlands, therefore its benefits outweigh its drawbacks [13].

In fact, irrigation has a lot of benefits. Although few documented cases conclusively demonstrate that water storage for irrigation unavoidably produced valuable wetland habitat for many organisms, including the red-crowned cranes, in poor nations, they do exist. For instance, water storage tanks in Sri Lanka unquestionably offer useful and priceless wetland habitats for a variety of wetland creatures. 22 species of herons, shorebirds, and ducks were observed at one such tank for a brief time in December 2000 which is the data that Hector Galbraith did not publish. Additionally, statistics from industrialized nations provide some information about the advantages of water storage and irrigation. For instance, there are more than 500 reservoirs in the UK. These reservoirs can be seemed as wetlands and offer homes for birds and other aquatic species. Moreover, the classification of 174 as Sites of Special Scientific Interest shows how significant these reservoirs are to biodiversity in general

[11]. It is a reasonable tactic to employ given that irrigation can increase the number of wetlands habitats for red-crowned cranes and that there may be more different types of prey there [13].

### 3.2. Government Interference

It is true that several nations have passed legislation to save red-crowned cranes. According to China's Criminal Law, for instance, anyone who illegally murders valuable and threatened wild animals unique protection from the state, or illegally buys, ships, or markets rare or endangered wild animals under distinctive state protection and their products, will be subject to a prison sentence of at least five years or more, depending on the severity of the circumstances, and a fine [14]. Also, the Japanese government started enacting rules banning the shooting of red-crowned cranes and restricting buildings in places where they reproduce [15]. However, those laws are not enough to help change the current situation of the red-crowned cranes, and the government should provide other methods and promulgate more relevant laws and regulations. To begin with, the government should establish laws and regulations to protect the important habitats, which are wetlands, of the red-crowned cranes. For example, there can be more limitations of human development of wetlands and the surrounding environment of wetlands, discharge of wastes such as sewage or industrial wastes containing toxic substances and so on. Besides, the government can establish medical institutions for red-crowned cranes. When red-crowned cranes are injured or sick, they can receive timely treatment, and red-crowned cranes can also receive rehabilitation treatment to restore their healthy bodies.

### 3.3. Education And Advocacy

A school could create a new program that all students must take. The frequency of this class does not need to be very high, it may be once every half a month, and the duration will not be very long. The duration of each class may be about one hour so that students' professional learning will not be affected.

In this new class, students will learn the role of the ecological environment, as well as some simple knowledge and practices to protect various ecological environments, such as recycling, and not littering. They will also learn about the value of red-crowned crane conservation and the significance of red-crowned cranes to the ecology. The original intention of this course is to make all students realize the importance of protecting endangered animals like the red-crowned cranes, and the ecological environment, such as the wetlands, and motivate them to take action to protect both endangered animals and ecological environments. In addition, students can also spread the knowledge and practices of endangered animals and ecological environment protection they have learned to their family members and other friends so that more people can understand endangered animals and ecological environment protection and their importance. In this way, when more and more people realize and gradually start to protect the endangered animals and the ecological environments, then the endangered animals, like the red-crowned crane, can be protected and ecological environments such as wetlands and forests will always exist and play their roles. Also, the other animals that live in those ecological environments will not be affected, and the functions of the environments can also help human life.

In addition, since all the teaching is the simplest and basic content, students majoring in endangered animal conservation and environmental protection will not be treated unfairly. Also, if zoologists and environmental scientists can engage in science-based advocacy, the results of publicizing the protection of endangered animals and ecological environments can be better. Scientists may improve environmental policies and actions by engaging in science-based lobbying, which draws attention to essential evidence from science and verifies that policies and their implementation are in line with the greatest information currently available [16]. Because of the reputation and credibility of those scientists, the message of protecting endangered animals and ecological environments will gradually spread, because the lobbying will attract a large audience and be quoted by many magazines and news. In this way, more and more people will listen to the speeches of scientists and begin to protect endangered animals and the ecological environments.

### 3.4. Money Acquisition

In order to solve the problem of not having enough money to build reserves, there are also many solutions. For example, people can separate the wetlands into several parts and then choose one of the parts of an area to raise some organisms which can bring some economic value. For example, people can raise alligators. According to the specific data, a total of 376,578 farm-raised alligators worth \$74.5 million were taken in Louisiana in 2020 [17]. The usages of the alligators are diverse. For example, since the skins of alligators are very precious, they can be used in the luxury industry, such as bags and coats. Also, during the American Civil War, alligator skin was frequently used, and thousands of alligators were murdered for their leathers which could be used to get plenty of profits [18]. Moreover, the meats of the alligators are also expensive, because they are beneficial to people's health. For example, they can be used to nourish the heart and lungs and treat cough and asthma. Also, alligators are beneficial to the ecosystem of the wetlands. Fish and other species might find sanctuary from the dry season's dropping water levels when alligators create holes to fill with water. These places thus offer the alligator a consistent source of food and a location to breed. Alligators utilize their snouts, claws, and tails to shift sediment and nutrients around in their places to maintain them and prevent them from being overgrown with plants. The places where the alligators are have greater nitrogen levels than those found in the nearby wetlands as a result of this soil disturbance [19].

On the other hand, people can also raise fish. It seems that the economic value of fish is not high, because the price of many kinds of fish is not high. After excluding fish with high prices, such as bluefin tuna, and commercial fishing, the economic value of fish in other aspects, especially recreational, is very high. According to a study of fish, animal, and recreational values, these wetland areas produced a direct yearly income of \$51.8 million in 1977 or \$489.69 per wetland acre [20]. If people can set up a fish breeding place in the wetland and provide fishing services, then do some publicity for fishing activities, such as parent-child activities, meeting with fishing friends, fishing competitions and so on. In this way, many people will come to participate in the fishing activity. Some people may want to enjoy a good time with their families, some people may want to make like-minded friends and so on. When there is a customer base, it is very easy to make money which can be used to improve the wetlands or spend on red-crowned cranes.

## 4. Summary

To sum up, the red-crowned cranes are now facing a very serious situation. as well as many problems that threaten their survival, such as the destruction of wetlands, human hunting, lack of funds to build habitats and provide various high-tech equipment and so on. But there are also many solutions related to those problems, such as irrigation, government Interference in making more protective laws and regulations, education and advocacy by famous and professional scientists and ways to gain funds. In response to the threats facing the cranes, it is incumbent upon mankind to take measures to protect the cranes, increase their numbers and improve their living environment. Therefore, the purpose of this essay is to urge people to save diverse habitats and endangered species.

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