

THE DANGER OF PRESERVING FEROCIOUS PREDATOR

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ABSTRACT

Currently, numerous ferocious animal species are being protected by the world in an extreme way with the reason of wildlife conservation. Ferocious predators are the culprits that cause serious consequences for the environment, humans, and society, such as the reduction of biodiversity, ecological imbalance, and making human life uneasy and stressful. This article presents the causes and solutions to overcome this situation to conserve wild animals in a smarter and more reasonable way. Some innovative and powerful measures include: separating the concepts of ferocious predators and other wild animals, allowing people to use strong measures when being attacked by dangerous animals, applying artificial intelligence and biotechnology to the conservation of wild animals, etc.

Keywords: conservation, wild animals, ferocious predators, self-regulating nature, wildlife conservation, AI technology, biodiversity.

I. INTRODUCTION

In recent time, the wildlife conservation movement is being widely embraced worldwide for many good reasons. However, at the same time, humans are also conserving even those wild animals that are ferocious predators. Here, we define "ferocious predators" as carnivorous species that are extremely aggressive, have a natural hunting instinct, and daily prey on weaker species for food. The problem lies in the fact that, due to subjective reasons, we tend to assume that all wild animals, including ferocious predators, should be preserved without considering their impact on the living environment of other species, including humans.

In reality, not everyone in the society deserves to enjoy the same freedom rights. Laws and human conscience agree that only citizens with moral integrity have the right to live freely in the community. As for evil people, they must be restrained, controlled, isolated, or eliminated to prevent harm to those around them.

How would we react if a management agency suddenly released several death row inmates (who are serial murderers) to live freely in our neighborhood? We would wonder why they released these wicked people into a peaceful community, and they would respond that it is necessary to preserve equality among all kinds of people, so they have to release them. Then the entire neighborhood would be in turmoil, and no one would have the mind to work for a living anymore. Every day, we would hear news of murders happening here and there. Similarly, a peaceful forest suddenly becomes disturbed when someone releases poisonous snakes, tigers, crocodiles, and lynxes. The entire forest will be chaotic and terrified. Just because we do not live in the forest, we cannot understand the pain and suffering of many animals that have to live with Ferocious Predators.

Conserving ferocious predators also comes at a great cost for humans. Among animal species, crocodiles are one of the most frightening species capable of killing humans, taking the lives of about 1,000 people each year¹. Specifically, Nile crocodiles are responsible for more than 300 cases². In Africa, hippos are the true "murderers" as they cause approximately 2,900 deaths each year³. Throughout Africa, lions cause hundreds of attacks and kill around 200 people each year⁴. Snakes are also considered extremely dangerous wild animals. Around the world, an estimated 5 million snake bites occur each year, of which venomous snake bites account for a significant proportion of deaths and illnesses. There are approximately 2.4 million snake bites and 94,000-125,000 deaths each year; 400,000 cases require amputation of some body parts

¹ Women's Newspaper (2022), *Crocodile attacks, kills 1-year-old boy in Malaysia*, website: <https://www.phunuonline.com.vn/ca-sau-tan-cong-giet-chet-be-trai-1-tuoi-lam-cha-bi-thuong-o-malaysia-a1479438.html>

² The worker newspaper (2023), *Mystery of the Nile crocodile that 'ate more than 300 people*, website: <https://nld.com.vn/video/bi-an-ca-sau-nile-an-thit-hon-300-nguoi-20221121145654556.htm>

³ Knowledge and Life Magazine (2022), *Despite how cute they are, hippos are still terrifying killers*, website: <https://kienthuc.net.vn/khoa-hoc-cong-nghe/du-ha-ma-co-dang-yeu-den-dau-van-la-nhung-ke-giet-nguoi-dang-so-1712300.html>

⁴ Newsweek, *Missing Woman Found Dead With Torso Missing After Suspected Lion Attack*, website: <https://www.newsweek.com/lion-attack-missing-woman-dead-torso-missing-zimbabwe-1641308>

and result in serious health consequences such as infection, tetanus, scarring, contractures, and psychological sequelae⁵.

In Vietnam, according to statistics from the toxicology department of Cho Ray hospital, during the period of 2010-2011, the department recorded less than 300 cases of snakebite victims per year. However, by the period of 2018-2019, this number had increased to over 700 cases per year. The number of people bitten by venomous snakes is increasing, with an overall mortality rate of 0.5%⁶.

In recent years, there have been many tragic accidents caused by ferocious predators in Vietnam, such as a tiger attacking and killing a worker and injuring tourists, an elephant trampling a tamer, wild boars attacking and killing people, and wild animal breaking into residential areas and injuring local people. Notably, in 2021 and 2022, many areas in Vietnam experienced a series of attacks by red-faced and pig-tailed macaques, which are endangered and rare forest animals belonging to group IIB and recorded in the Vietnam Red Data Book. These attacks include biting and killing much poultry in Quang Tri province, causing damage and injuries to local people in Ho Chi Minh City, and invading residential areas, attacking pets, and injuring children in Thai Binh province.

The above situation requires us to reconsider whether conserving these ferocious predator species is a wise decision or a disastrous mistake for the world as a whole?

II. CURRENT LAW SYSTEM IS PROTECTING FEROCIOUS PREDATORS IN AN EXTREME WAY

Currently, many organizations, governments, and experts around the world are making efforts to call for the conservation of wildlife, including ferocious predators.

Vietnam is also a country that actively supports this movement and has signed many international conventions and documents related to the conservation of wildlife, such as the CITES Convention (on the trade in endangered wild fauna and flora)⁷, the

⁵ SafeVietnam (2017), *Biting/Stinging animals | Worldwide | Overview*, website: <http://safevietnam.org.vn/tong-quan-10647>

⁶ Labor Newspaper (2023), *Increase in the rate of people poisoned by diverse agents*, website: <https://laodong.vn/xa-hoi/gia-tang-ti-le-nguoi-ngo-doc-voi-tac-nhan-ngay-cang-phong-phu-1151518.lido>

⁷ Digital newspaper of Vietnam's Ministry of Natural Resources and Environment (2020), *CITES Convention and Vietnam's participation*, website: <https://monre.gov.vn/Pages/cong-uoc-cites-va-su-tham-gia-cua-viet-nam.aspx>

CBD Convention (on biological diversity)⁸, the Bonn Convention (on the international trade of endangered wild fauna and flora)⁹, the Cartagena Protocol (on biosafety)¹⁰...

In addition, there are many laws and legal documents (decrees, decisions) that contain provisions protecting wild animals classified according to the level of endangerment of each species in the list of Circular No. 04/2017/TT-BNNPTNT. Among the species of wild animals that need to be protected in this list are many ferocious predators such as King Cobra, Green Pit Viper, Malayan Pit Viper, Tree Python, Saltwater Crocodile, Tiger, Clouded Leopard...

Vietnam has issued laws and decrees that impose very severe penalties for violating these laws.

For wild animals, acts such as hunting, killing, captivity, storage, transportation, and illegal trade of animals listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) can result in **imprisonment for up to 12 years; organizations may be fined up to 6 billion VND and permanently suspended** (Article 234-2015 Penal Code)¹¹.

Regarding endangered, rare and precious animals, anyone who violates regulations on the protection of animals listed in the Endangered, Rare and Precious Species List or the list of endangered, rare and precious forest plants and animals in Group IB or Appendix I of the CITES Convention may be **sentenced to up to 15 years in prison; organizations may be fined up to 15 billion VND and may be permanently suspended** (Article 244 - Penal Code 2015)¹².

⁸ Digital newspaper of Vietnam's Ministry of Natural Resources and Environment (2020), *CBD Convention and Vietnam's participation*, website: <https://monre.gov.vn/Pages/cong-uoc-cbd-va-su-tham-gia-cua-viet-nam.aspx>

⁹ Digital newspaper of the Communist Party of Vietnam (2018), *Convention on International Trade in Endangered Species of Wild Fauna and Flora, signed in Washington, D.C. on March 3, 1973, amended in Bonn on June 22, 1979; Vietnam joined on January 20, 1994*, website: <https://tulieuvankien.dangcongsan.vn/ho-so-su-kien-nhan-chung/luat-quoc-te/cong-uoc-ve-buon-ban-quoc-te-cac-loai-dong-vat-thuc-vat-hoang-da-nguy-cap-ky-ket-tai-washington-d-c-ngay-331973-sua-3348>

¹⁰ Digital newspaper of Vietnam's Ministry of Natural Resources and Environment (2020), *Cartagena Protocol on Biosafety*, website: <https://vupc.monre.gov.vn/bao-ton-va-su-dung-ben-vung-da-dang-sinh-hoc/1623/nghi-dinh-thu-cartagena-nam-2000-ve-an-toan-sinh-hoc>

¹¹ Court Journal digital newspaper, (2020), *Discussing the crime of "Violating regulations on protection of wild animals" stipulated in Article 234 of the Penal Code 2015*, website: <https://tapchitoaan.vn/ban-ve-toi-vi-pham-quy-dinh-ve-bao-ve-dong-vat-hoang-da-quy-dinh-tai-dieu-234-blhs-2015>

¹² Court Journal digital newspaper, (2023), *International Convention on Trade in Endangered Species of Wild Fauna and Flora and relevant laws of Vietnam*, website: <https://tapchitoaan.vn/cong-uoc-ve-buon-ban-quoc-te-cac-loai-dong-thuc-vat-hoang-da-nguy-cap-va-cac-quy-dinh-cua-phap-luat-viet-nam-co-lien-quan>

In Vietnam National Biodiversity Strategy to 2030, vision to 2050, the protection and conservation of wild species, especially endangered ones, is one of the main objectives.

III. THE FALLACY OF CONSERVING FEROCIOUS PREDATOR

Different characteristics of ferocious predator

In current international and Vietnamese laws on the protection of wildlife, the focus is on the endangered, rare, and precious species without any difference towards ferocious predators. This means that the law considers all wild animals, including dangerous ones, as equally important for conservation efforts.

According to experts, conserving endangered species (regardless of whether they are dangerous or not) is essential because they play a crucial role in maintaining biodiversity and ecological balance, while providing many benefits to human activities such as economics, agriculture, and medicine. Additionally, the effects of climate change, environmental pollution, and human hunting have seriously reduced the number of wild animal species, putting them at risk of extinction. Therefore, when a species is endangered or threatened with extinction, countries include them in the red data book and make many efforts to protect them through various laws and measures.

However, using this reason to conserve ferocious predators is a big mistake. ***This is because these species have different characteristics compared to other wild animals, and more importantly, they are the culprit that causes many unpredictable consequences for the natural environment and humans.***

Wild animals are species that have not been domesticated and typically live in natural environments¹³. Meanwhile, "ferocious predators" are a term mentioned in Vietnamese Civil Law in Article 623 as one of the highly dangerous sources.

Ferocious predators have characteristics such as being extremely aggressive and always ready to attack any target that is nearby or within their range. This originates from their natural hunting instincts. Even when targets do not show any signs of threat or attack them, they are still ready to attack. This is also one of the prominent features that distinguish ferocious predators from other wild animal species. The attacking

¹³ According to the "American Heritage Dictionary of the English Language, Fifth Edition"

behavior of other wild animal species is mainly for self-defense. In contrast, the attacking behavior of ferocious predators is not for self-defense, but rather proactive attacking behavior. Ferocious predators are also species that "do not accept" human control, and they always resist human management as well. Even when they are under human control, with just a small mistake from the manager, ferocious predators can escape and even attack the person managing them. This is the characteristic that demonstrates the importance of strict management of ferocious predators. There can be no negligence in managing these species.



Ferocious predators on the hunt (Photo: Internet)

The ferocious predator is a "destroyer" of biodiversity

One of the core goals of wildlife conservation is to maintain ***biodiversity***. However, ferocious predators kill other species for meat, contrary to this goal. When released into a habitat with mild-mannered animal species, they will cruelly hunt and kill prey, causing the entire area to be in fear and at risk of decreasing the population of that species. For example, in Zimbabwe, an increase in lion populations has led to a significant decline in the number of giraffes. In areas where there are no lions, the giraffe population is 34% young, while in areas with lions, the percentage is only 6%¹⁴.

¹⁴ Conservationjobs (2018), *Impact of Lions on Falling Giraffe Populations*, website: <https://www.conservationjobs.co.uk/articles/impact-of-lions-on-falling-giraffe-populations>

Ferocious predators are also one of the dangerous factors leading to the decline of the very rare individuals that need to be conserved. For example, the jaguar is one of the largest species of the cat family, originating from South America. The jaguar's food list is very diverse, including hundreds of species from land animals such as deer, peccaries, rats, and snakes to aquatic creatures such as fish and turtles. Therefore, if the jaguar appears in the community of wildlife, at least hundreds of species in their food chain are at risk of being killed, including rare species that need to be conserved.

The impact of ferocious predators is not limited to the number of species killed but also the way they use their prey. On average, a leopard needs 4 kg of meat per day¹⁵. However, when hunting, they can slaughter many animals and only use a small amount of the victims. In Quang Tri, leopards have caused many cases of sudden death and mysterious disappearance of goats on farms. Some of them were seriously injured with many body parts missing¹⁶.

Some argue that the ferocious predators in the red book that need to be conserved have very few individuals and will not significantly affect other animal species or humans. This is not always true. In 2012, 28 Tasmanian devils were brought to Maria Island (Australia) for conservation, but in just a few years, they wiped out the entire population of more than 3,000 pairs of penguins. In addition, many other animals such as Cape Barren geese on Maria Island and native hens have also been slaughtered by these ferocious predators¹⁷.

If a human commits a crime, they are imprisoned, while ferocious predators (which kill other species) are released into the wild in the name of conservation. Does this mean that "animal rights" are higher than human rights? Those who go into the forest to cut down trees are convicted of destroying nature, but releasing ferocious predators into the forest to hunt and eat other species is considered protecting nature.

¹⁵ Health & Life electronic newspaper (2017), *Lifestyle and necessary food intake for a Clouded Leopard*, website: <https://suckhoecuocsong.vn/loi-song-va-so-luong-thuc-an-can-thiet-cho-mot-con-bao-hoa-mai>

¹⁶ Youth Online, Quoc Nam (2018), *Clouded Leopard footprints found near residential area in Quang Tri*, website: <https://tuoitre.vn/xuat-hien-dau-chan-bao-hoa-mai-gan-khu-dan-cu-o-quang-tr-20180301220041634.htm>

¹⁷ VTV News, Quynh Chi (2021), *Tasmanian Devil preys on thousands of penguins on Australian island*, website: <https://vtv.vn/the-gioi/thu-an-thit-quy-tasmania-tan-sat-hang-nghin-con-chim-can-h-cut-tren-dao-australia-20210622153701652.htm>

When will scientists and conservationists stop deluding themselves that they are protecting nature by conserving ferocious predators?

Watching videos of ferocious predators savagely killing horses, deer, and cattle in the forest is heartbreaking. The helpless animals endure excruciating pain and suffer while being devoured by ferocious predators. A mother antelope even stands still, letting a tiger eat her to save her two fawns. Many animals suffer and die in order that humans can feel proud of their efforts to preserve nature.

Ferocious predators disrupt ecological balance

Ferocious predators not only cause loss of biodiversity, but also directly ***disrupt the balance of the ecosystem***. Ecological balance can be understood as the maintenance of stable levels of factors in the ecosystem, including the number, density and habitat of species. In an ecosystem, species always interact closely and are dependent on each other for survival. For example, plants absorb water and nutrients from the soil to grow, deer eat plants, tigers eat deer, and after they die, the remains of tigers are decomposed by microorganisms and become nutrients in the soil. It is thanks to such stable circulation that all species can coexist. The excessive development or disappearance of one species will affect the entire ecosystem.

Currently, scientists support the theory that ***nature has ecological resilience***, meaning that the ecosystem can self-adjust and balance itself, so humans should not interfere in any way. This is something we need to reconsider.

It is true that the ecosystem can self-balance, but that ability is limited. If any factor changes too much, the system will not be able to maintain a state of equilibrium, and ferocious predators are a species with a high risk of causing such disruptions.

According to the US Geological Survey (USGS), the Burmese python in southern Florida is posing one of the most challenging ecological management issues. Initially, only a few snakes were introduced into the wild through the pet trade, and they were virtually harmless. However, due to their strong fertility, the Burmese python population has exploded in this area. An individual python can grow up to 6 meters long and hunt nearly all other animal species in the natural ecosystem. Since the appearance of the Burmese python, the number of other wild animal species has

significantly declined. Despite the application of numerous measures, researchers have concluded that eradicating the python in southern Florida is nearly impossible at present¹⁸.

In the case of the “Canadian super pig”, since being released into the natural environment, their population has exploded and invaded the territory of the United States¹⁹. They feed on vegetation, damage trees, and pollute water sources, causing up to \$2.5 billion in damage in the US each year. They are also a reservoir for viruses that can be transmitted to humans, such as swine flu, E.coli, and Salmonella. In addition to the harm to humans, super pigs also hunt and harm native wildlife, such as ground-nesting birds like quails, raptors, turtles... *"Super pigs are also cunning predators. The male ones have long tusks, so they can run and catch their prey. They also kill young animals and destroy the nests of other species"*. All attempts to eradicate these feral pigs have failed so far. In places like Florida, California, Oklahoma, and Texas, their population is large and widespread to the point where local authorities have shifted their focus to managing the damage rather than eradicating the species²⁰.



Map of super pig locations appearing in Canada (Photo: Internet)

¹⁸ VnExpress (2023), *Florida unable to eradicate Burmese pythons*, website: <https://vnexpress.net/florida-khong-the-xoa-so-tran-mien-dien-4583641.html>

¹⁹ VnExpress (2023), *"Super pigs" spreading throughout Canada*, website: <https://vnexpress.net/sieu-lon-lan-khap-canada-4589574.html>

²⁰ VnExpress (2023), *Invasive wild pigs cause significant crop damage in the United States*, website: <https://vnexpress.net/lon-hoang-xam-hai-mua-mang-nuoc-my-4567058.html>

We are only concerned with the natural self-balancing ability, forgetting that it has limits. With the development of modern science and technology, humans can change the natural environment and therefore have a responsibility to create positive and beneficial impacts on it.

In reality, many ecosystems have been improved thanks to the hands and minds of human beings. In a recent article, in Huu Ngoc district (Son Tay province, China) located on the edge of the Maowusu desert, where it used to suffer from sandstorms year-round. After a night, the houses were often covered with sand, blocking the entrances and exits, and the residents had to use shovels to clear the sand. However, the local government and people have made efforts to plant forests and protect the ecosystem for over 7 decades. As of the end of 2021, more than 962 km² of eroded land in Huu Ngoc district has been covered with large green patches. The phenomenon of sand flying has been controlled, and farming has become more favorable. The once barren land has turned into an oasis in the desert²¹.

Transforming the desert into a lush oasis in Huu Ngoc district is evidence of success in environmental restoration that has awakened us. From ancient times, we have always believed in the theory of leaving everything in nature alone and not interfering with it, thinking that it is a way to respect and protect nature. But it is time for us to change that backward notion. Anyone who says that we should let nature handle everything is wrong. When wanting to preserve nature and biodiversity, humans must intervene instead of leaving it alone. For example, humans must prevent desertification, soil erosion, build embankments to protect against ocean waves and protect sea turtles laying eggs.

Similarly, When it comes to the conservation of wildlife, we often rely on *the Ecological resilience of nature* and forget the role of "intelligent humans" in monitoring and evaluating the biological balance and intervening in nature in a suitable way to help nature develop in a better direction. On the other hand, ferocious predators are the ones who destroy many species in nature, killing and eating other species. Conservation of ferocious predators aids in destroying nature. The more diverse an

²¹ VnExpress digital newspaper (2022), *7 decades of turning the desert into an oasis*, website: <https://vnexpress.net/7-thap-ky-bien-sa-mac-thanh-oc-dao-4518598.html>

ecosystem is, the more stable its equilibrium state. Therefore, a natural ecosystem is sustainable when many species are coexisting. Ferocious predators threaten the diversity in a species community as well as the ecosystem in general. This makes ferocious predators unsuitable for a sustainable natural ecosystem.

We ask the question: what would happen if dinosaurs still existed today? Surely, humans would be wiped out by these creatures. Dinosaurs must disappear for humans to appear. If dinosaurs were still around, perhaps this Earth would only have dinosaurs and humans would not exist, and the Earth would not be as diverse as it is today. Nature has made its choice. Ferocious predators are not suitable for the existence of other species. The world needs biodiversity but not many ferocious predators. We calmly watch a leopard biting a calf's neck without intervening, thinking that we should let nature take its course, while a herd of wild buffalo struggles to attack the leopard to save the calf. So when someone puts a knife to our throat, do we let nature take its course or do we cry out for help?

When nature uses the "jungle law" to arrange things, the species kill each other in agony because they do not know where to stop. If we let nature handle it, then who will be responsible for the pain of animals when they are bitten and torn apart? This is clearly a mistaken notion of science.



Ferocious predators on the hunt (Photo: Internet)

Some people believe that ferocious predators have the function of reducing herbivores (animals that only eat plant) to protect vegetation. Unfortunately, ferocious predators cannot control themselves, even attack and kill humans as well. In fact, we have many ways to protect vegetation that do not depend solely on ferocious predators. For example, in addition to planting long-term forest protection trees, we can also plant fruit trees to meet the food needs of herbivores. Fruit trees have both faster growth and spreading characteristics than long-term forest trees and the ability to provide sustainable food sources for wildlife. Or we can control the number of herbivores by sterilizing them when they grow too much. The real issue is that humans need to play a smart and reasonable role in adjusting nature, not relying on the hunting ability of ferocious predators and letting nature handle it.

Wild animals in the forest also need to live in peace, but humans are not yet capable of bringing laws into the forest, so there is only the "jungle law" - where the strong live and the weak die. If humans consider themselves the masters of the world, then they must take responsibility for making the world better. One day, we must bring civilized laws into the lives of wild animals. We must aim for this, and scientists must think about this.

We need to carefully study the level of danger posed by ferocious predators. Instead of releasing ferocious predators into the ecosystem like any other wild animal, we need in-depth research to evaluate their level of harm to the existing habitat. This is because when in correlation with other wild animal species in the same habitat, ferocious predators can have a significant impact and likely cause a serious ecological imbalance rather than contributing to the biodiversity of the area. This is a cautious and necessary step, not to leave the current situation without a mechanism to control ferocious predator species.



Release wild animals back to nature (Photo: TTXVN)

Ferocious predators make human life become unrest and dangerous.

Worldwide, the number of accidents caused by ferocious predator attacks is increasing. Humans try to conserve wild ferocious predators without ensuring their safety or the people around them. We believe that preserving the diversity of animals, including ferocious ones, is a meaningful pursuit, but we fail to anticipate the serious consequences that these animals may bring.

In areas that are prone to floods, crocodiles and snakes are a constant threat to human lives. In the Western Vietnam riverside region, people rely very much on the rivers. If, unfortunately, crocodiles or snakes are preserved in such areas, the lives and safety of the locals will be severely threatened. Furthermore, forms of water transportation are also affected, causing economic and tourism-related problems. In the past, in the Western region of Vietnam, whoever killed a crocodile was considered a hero because crocodiles are inherently ferocious predators with sharp hunting skills. They often lurk underwater, moving quietly without making any noise, only revealing their eyes to observe prey. They are especially dangerous to children. If a river has many crocodiles, no one dares to build a house on stilts above the river, and there will be no floating markets to bring income or make the "cultural specialties" of the Western region. This is evidence that ferocious predators cause the environment unsafe and dangerous for humans and other species, and we need to consider removing them from the list of preserved animals as it is a cautious and necessary step.



Crocodiles hunting prey in the river (Photo: Unplash)

Some views suggest that ferocious predators are preserved in separate areas, and attacks on humans are the fault of the management agencies not being strict enough, rather than the fault of wildlife protection laws.

In fact, the law has not separated the concept and sanctions specifically for ferocious predators, still treating them like other wild animals. Therefore, the management of ferocious predators in conservation areas is not different from that of other wild animals. The law has not provided direction for the management of ferocious predators to be carried out according to a special procedure. If it is considered that criminals are dangerous to the world of humans and need to have their rights and scope of activity restricted (by imprisonment), then why don't ferocious predators have similar laws? Ferocious predators are carnivorous, aggressive species, so should they be considered as a particularly harmful species that needs to have its range of activities restricted, instead of promoting conservation as is currently being done? Laws have not been supplemented to guide the management of ferocious predators, making management extremely difficult.

Currently, many conservation areas are becoming increasingly close to residential areas, so dangerous species can easily approach people. Conservation areas

do not provide enough food for ferocious predators, so they have to hunt for prey outside of designated areas, where there are dense villages or residential areas. The rapid growth of ferocious predator populations exceeds the number of prey in conservation areas, forcing them to wander in search of food. Therefore, controlling the number of ferocious predators also needs to be calculated appropriately in relation to the proportion of other species in the same ecosystem. Current conservation areas have not developed a strict program for managing ferocious predators, and even lack fences to prevent them from invading residential areas outside.



Tiger encroachment into human settlements (Photo: Internet)

Furthermore, ferocious predators not only exist in conservation areas but also outside of them, posing many potential risks to humans. Under Article 244 of the 2017 Criminal Law, violations of regulations on wild animals can result in administrative fines ranging from 500 million to 15 billion VND and the maximum criminal penalty of up to 15 years in prison²². Therefore, if dangerous species such as king cobras or green snakes appear in residential areas, people will be trapped in dealing with the risk of invasion. People may choose to protect themselves, leading to the killing of these animals and facing penalties or fleeing without being able to resist due to fear of the law protecting these wild animals. This is a difficult situation for the people, which has

²² According to Article 244 of the Vietnam Criminal Code 2017: *Violation of regulations on protection of endangered, precious, and rare animals*

actually happened. Since 2005, people in the Northwest region have suffered from the invasion of dholes from Cambodia, causing significant damage to their livestock, estimated at 30 to 40 buffaloes and cows per year. This is a significant asset of the mountainous people who have to bear heavy losses. Their desire now is *"to ban us from hunting, so the government must have measures to chase away the dhole pack and protect the livestock of the local people"*²³. Is this the consequence of conservation laws that have not distinguished separate measures for carnivorous and ferocious wild predators?

Some viewpoints suggest that if the law does not protect ferocious predators, they will be freely hunted and face the risk of extinction. In fact, we propose that management agencies and scientists control the number of ferocious predator species to achieve sustainable ecological balance, not to allow people to freely hunt and trade illegally. Controlling the number of ferocious predators is a complex task that requires expertise and authority of the relevant agencies. Unjustified hunting and killing of ferocious predators by individuals without legitimate reasons (such as protecting the economic base, livestock, or self-defense) and without the permission of the management agencies will be considered destructive behavior and violation of the law, which must be strictly punished. In this way, the law can demonstrate fairness and strictness. The law can protect human safety, while also regulating appropriate provisions to prevent people from exploiting and unintentionally or deliberately harming ferocious predators. In addition, we can conserve endangered ferocious species which possess economic value, medical value, and rare genetic sources in separate areas to eliminate the possibility of being trapped and hunted. This is a flexible mechanism under the control of authorized agencies and will gradually be improved to create a balanced ecological environment and harmonious benefits between species and humans.

²³ People's Public Security (2014), *The Fire Wolves - Nightmare of the Northwest ethnic minority*, website: <https://cand.com.vn/Phong-su-Tieu-diem/Soi-lua---Ac-mong-cua-dong-bao-dan-toc-Tay-Bac-i322766/>

IV. SOLUTION

If we continue to conserve ferocious predators in the same way as we do now, treating ferocious predators like other wild species without evaluating their harmful effects on the surrounding ecosystem, then we are unconsciously assisting these predators in taking the lives of weaker species and indirectly causing dangerous intrusions into human life. The law must be strict, as being lenient with the wicked is cruel to the innocent. Conserving ferocious predators as we do now is a mistake and must be seriously reconsidered. Humans must intervene in a smart, selective, and careful way to adjust the situation.

1. Intelligent conservation of wildlife

Intelligent conservation is a conservation approach based on assessing the level of danger and impact of a species on the ecosystem, humans, and other species.

Currently, endangered, rare, and valuable animal species are prioritized for protection based on two criteria:

- First: The number of individuals that are scarce or threatened with extinction (as specified in Article 5 of Government Decree No. 160/2013/ND-CP dated November 12, 2013).
- Second: They are endemic species or have special values in science, medicine, economics, ecology, landscape, environment, culture, and history (as specified in Article 6 of Government Decree No. 160/2013/ND-CP dated November 12, 2013).

The current conservation of wildlife has not yet assessed the impact on the ecosystem of each species. Vietnam's Red Data Book only relies on the criteria of the risk of extinction for conservation, without providing criteria based on the interaction between species. Therefore, it is necessary to consider an additional criterion: "the threat of a species to biodiversity and the safety of humans".

This criterion will help to differentiate the concept of "ferocious predators" as a distinct subset of the wild animal population, and this differentiation will enable us to develop more specific and effective conservation measures for each type. For species of ferocious predators that are at risk of extinction, humans need to intervene more deeply to manage them.

By distinguishing between the two concepts of "ferocious predators" and other wild animals, we will have different conservation approaches for these two subjects. Typically, in a conservation area, each species plays a role in food chains, and any drastic change in any species will cause disturbances in the corresponding food chain and disrupt the ecological balance of the area. Therefore, precisely calculating conservation is what managers do to establish a balanced ratio between ferocious predators and other species in the food chain to ensure that ferocious predators do not increase in numbers too quickly, leading to the decline of other species.

Whenever a ferocious predator is released into the wild, we should imagine how many other animals it will kill. We do not have an exact ecological balance equation, but enthusiastically releasing ferocious predators into the forest may harm how many other species.

For example, a conservation area is in ecological equilibrium with 5 individuals of the Asiatic wild dog species and 100 individuals of deer, elk, and other prey species of them. Now, if an additional Asiatic wild dog is released into the conservation area, their consumption of prey will exceed the reproductive capacity of the prey species. At that point, we must control and restrain the growth of the Asiatic wild dog population by sterilization or by preventing the male and female individuals from mating, or by relocating them to another conservation area. If there are no other options, we may have to eliminate some individuals of the Asiatic wild dog population to restore ecological balance. If the Asiatic wild dog population grows too rapidly without control, soon there will be no prey species left in the conservation area. The ecosystem will then be severely imbalanced, with too many predatory individuals and no prey species existing.

An example of this is Sweden granting licenses for hunters to kill 201 Eurasian lynxes on March 2, 2023, several weeks after the country held its largest wolf hunt in decades²⁴. Perhaps they discovered that the lynx predated on many other species, causing the forest areas to become less biologically diverse. At this point, eliminating

²⁴ VnExpress digital newspaper (2023), *Sweden to eradicate hundreds of lynx*, website: <https://vnexpress.net/thuy-dien-sap-tieu-diet-hang-tram-con-linh-mieu-4577589.html>

some of the ferocious predators that were previously protected is actually protecting ecological balance and biodiversity, which is a higher goal we need to strive for.

Furthermore, the conservation of ferocious predators also requires selection, which is understood as selecting species that need to be conserved and those that do not, selecting the number of each species that need to be conserved, and selecting the area for conservation. Basically, all ferocious predators are highly dangerous. However, we should classify them into two groups based on their level of danger to humans and other animals in order to make appropriate conservation decisions, as follows:

- Group 1: Extremely dangerous ferocious predators, ready to attack humans and other animals, including crocodiles, tigers, leopards, lions, wolves, viper snakes, green snakes, sharks, hammerhead sharks, swordfish, etc.
- Group 2: ferocious predators with moderate danger, rarely attacking humans, including wild cats, rays, non-toxic snakes, etc.

Among these two groups, the ferocious predators in Group 1 are not only dangerous to humans and other animals but also consume a large amount of food from prey species. Conservation and management of these animals encounter many difficulties. Therefore, for the ferocious predators in Group 1, we should only conserve enough to preserve rare gene sources, prevent extinction, and serve some necessary medical or scientific research, rather than over-conserving them, which would endanger human lives and other animals. We need to use advanced artificial intelligence algorithms to know how to conserve nature and wildlife in a balanced and biodiverse way.

As for the ferocious predators in Group 2, we still need to carefully calculate to control them in a moderate amount, harmoniously in the ecological environment. Conserving them in a reasonable way will help improve the quality and efficiency of protecting wildlife in general and ferocious predators in particular, as well as reduce the pressure on the conservation area management system and significantly reduce threats to the lives and livelihoods of local communities.

In addition, humans also need to control the number of ferocious predators, and avoid increasing them excessively, causing their food and habitat needs to increase,

resulting in the slaughter of many other wild animals and encroaching on the human living environment.

On the other hand, we also need to protect the environment and avoid ruining their habitats which causes ferocious predators to find food frenziedly and attack human settlements.

2. Proposal for adjusting the law related to wildlife conservation

a) Abandoning clauses related to international agreements on wild animal conservation

In many cases, when the number of individuals of ferocious predators increases too quickly compared to the prey species, it affects the biodiversity and ecological balance. Moving these predator species to other conservation areas or sterilizing them is often infeasible or extremely costly. Therefore, controlled culling of a certain number of individuals of that species can be considered to ensure ecological balance for the area.

Florida is a typical example where about 1.3 million alligators live, and the number is skyrocketing. The authorities often have to “**ethanize**” them to avoid disturbance and ensure safety for the local residents²⁵. They are right in doing so because if left unchecked, this fierce swamp predator will increasingly thrive, and life in the area will no longer be peaceful. Residents would have to live in a state of tension and crisis knowing that alligators are always lurking around. On the other hand, without alligators, the ecosystem can still be sustained.

To accomplish this, we need to pose recommendations to the International Union for Conservation of Nature (IUCN), the organization that issued the CITES Convention - the Convention on International Trade in Endangered Species of Wild Fauna and Flora - to make the conservation of ferocious predators species more reasonably.

We support regulations prohibiting illegal hunting, killing, breeding, captivity, transportation, and trafficking of wild animals or the possession, transportation, and trafficking of individuals or body parts that cannot be separated from living or wild animal products, as well as strict penalties that countries are implementing. However,

²⁵ Zing News (2023), *Crocodile euthanized after entering and biting resident in their home*, website: <https://zingnews.vn/ca-sau-bi-an-tu-sau-khi-go-cua-va-can-nguoi-trong-nha-post1413569.html>

we will propose not to conserve ferocious predator species in an extreme way that poses a risk to human life, health, and other animal species, so that countries can actively eliminate some ferocious predator species when necessary to ensure biodiversity and ecological balance, as well as safety for humans and other animal species. This eradication must be carried out in a reasonable, controlled, well-planned manner and must be notified to member countries participating in the CITES Convention to ensure transparency and effectiveness.

The increasing seriousness of the damage caused by ferocious predators to humans and the environment is a wake-up call to the world about the dangers of conserving ferocious predators. We need to maintain our proper stance to persuade the world to true values.

b) Adjusting some laws and guidelines under the law

It is not uncommon for us to come across news about people living near natural forests being attacked by ferocious predators. According to the current legal regulations, not every time a ferocious predator attacks or threatens the life or property of people, they have the right to trap or shoot it immediately for self-defense. Article 8, Decree 06/2019/ND-CP of the Government stipulates that:

"In case endangered, rare forest animals pose serious threats to human life or property, organizations and individuals must apply measures to repel and limit damage to animals, and inform the nearest Forest Protection Department or People's Committee at the commune or district level.

In case endangered, rare forest animals directly attack human life in outside protected forests despite the application of measures to repel them, the Chairman of the People's Committee at the district level will make a decision and direct the trapping, capturing, or shooting of that animal. At this point, people have the right to trap, or shoot according to the decision and guidance of the Chairman of the People's Committee at the district level."

In fact, in situations where extremely ferocious predators in group 1 attack without support from others, it is very difficult to just drive them away without killing them. If waiting for the authorities to come and provide support, the lives of the people may not be protected. Therefore, to reasonably conserve ferocious predators species,

ensure the safety of human life and property, the following proposed supplementary amendments are suggested:

"In the case of endangered, rare, and dangerous forest animals that seriously threaten property or directly threaten human life outside of special-use forests, protected areas, at this time, organizations and individuals may apply measures to drive away, cause harm, or even destroy these forest animals to ensure safety for human beings. At the same time, they must immediately inform the Forest Protection Agency or the People's Committee at the nearest commune or district level."

Afterward, the authorities may come to examine the scene, take testimony from organizations and individuals to determine whether the defense is justified or not to be processed according to the law. However, we also need to be vigilant about cases that someone would exploit this law to illegally hunt or kill wild animals.

3. Other solutions

Today, with the progress of science, technology, engineering, and biology, we are able to intervene by applying one or more different methods to control ferocious predator species.

Enhancing management capacity is an important solution to ensure safety for humans and other animal species, as well as to effectively protect and manage ferocious predators. Methods include training and recruiting experienced and highly specialized staff in wildlife protection. Animal management personnel need to have knowledge of behavior, ecology, pathology, and environmental restoration, as well as safety and risk management skills. In addition, enhancing the management capacity of ferocious predators also requires ensuring adequate and quality resources and equipment to help animal management personnel operate effectively.

Conservation of wilderness requires intelligent and meticulous calculation. We must calculate how many trees there are in the forest, what types of trees they are, the area of the forest, what animals inhabit the forest, and how to maintain ecological balance when adding new species. This is a problem that only artificial intelligence (AI) can solve. In recent years, with the remarkable progress of science and technology, AI has been applied to the conservation of wilderness. Scientists in Australia have successfully designed an automated robot to prevent crown-of-thorns starfish invasion

in the Great Barrier Reef²⁶. The robot uses computer vision technology to navigate, avoid obstacles, and perform complex scientific tasks.

It can accurately identify the species of coral-eating starfish with a precision of up to 99.4%, and then inject poison to kill the creature without affecting the surrounding environment.



Applying AI and Big Data Technology to biodiversity conservation (Source: <https://www.datanami.com/>)

The development of AI has also been expanded on a larger scale. In 2020, the Mbaza AI image classification algorithm was used to monitor large-scale biodiversity in the Lopé and Waka National Parks of Gabon²⁷. The algorithm analyzed over 50,000 images collected from 200 camera traps covering 7,000 km² of forest. Mbaza AI can classify up to 3,000 images in an hour with an accuracy of up to 96%. Another study applied AI to identify dominant tree species in parts of the Sierra Nevada range in California. The data showed that red indicates areas of live oak trees in the foothills, green represents sugar pine and white fir trees, and sky blue is for whitebark pine trees²⁸. The application of AI in wilderness conservation promises to provide a more comprehensive and accurate picture in the future.

²⁶ Fatherland newspaper (2018), *Australia uses robots to protect the Great Barrier Reef*, website: <https://toquoc.vn/australia-su-dung-robot-bao-ve-ran-san-ho-great-barrier-99245249.htm>

²⁷ The Guardian (2022), *Five ways AI is saving wildlife – from counting chimps to locating whales*, website: <https://www.theguardian.com/environment/2022/feb/21/five-ways-ai-is-saving-wildlife-from-counting-chimps-to-locating-whales-aoe>

²⁸ IEEE Spectrum (2020), *This AI can see the forest and the trees*, website: <https://spectrum.ieee.org/this-ai-can-see-the-forest-and-the-trees>

Artificial intelligence (AI) technology has the ability to evaluate the weather, climate, and other ecological factors at each moment, and thereby can intervene to adjust the factors to help the ecosystem achieve a state of balance. In Brazil, over the past 30 years, more than 15% of the surface water has been lost. However, this surface water crisis has only been brought to light with the help of artificial intelligence. The rivers, lakes, and wetlands of this country are facing increasing pressure from population growth, economic development, deforestation, and the serious impacts of climate change. However, no one knew the scale and seriousness of this problem until the MapBiomas water project was announced in August 2021. The results obtained after processing more than 150,000 images taken from satellites of the US National Aeronautics and Space Administration (NASA) over an area of 8.5 million km² of Brazilian territory showed that the Negro River, a major tributary of the Amazon, has lost 22% of its surface water. The world's largest wetland area, the Pantanal (Brazil), has also lost 74% of its surface water²⁹. These losses are devastating over 4,000 plant and animal species in the Pantanal. AI can also distinguish between natural and artificial water bodies. Without AI, researchers could not analyze changes in water levels nationwide in such large and detailed scales.

Artificial Intelligence (AI) is a technological solution to address the biodiversity crisis and reduce climate change. It is an intelligent conservation approach that can help us comprehensively, efficiently, and quickly monitor, analyze, and manage wildlife.

The application of biotechnology in wildlife conservation has shed light on the origins, evolution, and adaptation of species. Modern biotechnology applications such as cell reprogramming, stem cells, and modern reproductive biotechnology help conserve the gene pool of rare animal species. Additionally, the application of biotechnology to inhibit animal reproduction is one of the methods proposed to minimize the explosive growth of ferocious predators. Seidler and colleagues' research on sterilizing coyotes to reduce their predation on pronghorns showed that using sterilization methods reduces the energy demand of coyotes, which may reduce the rate

²⁹ Environmental Protection newspaper (2022), *Five ways AI contributes to conservation efforts*, website: <https://baovemoitruong.org.vn/nam-cach-tri-tue%CC%A3-nhan-ta%CC%A3o-dong-gop-cho-ba%CC%89o-ton-loai/>

of predation on juvenile pronghorns by infertile coyotes. Sterilizing coyotes is a method that helps increase the survival rate of juvenile pronghorns in areas where the survival of pronghorns is critical to the existence of the pronghorn community³⁰.

Scientists at Oxitec, a UK-based company, have conducted trials on genetically modified mosquitoes of the *Aedes* species, which are intermediate hosts for transmitting the Zika virus and dengue fever. The use of genetically modified mosquitoes to limit the spread of the Zika virus has shown the potential to eradicate around 90% of disease-causing mosquito populations³¹. In Florida, US, 20,000 genetically modified mosquitoes carrying the *Wolbachia* bacterium have been released in the Key West area to prevent dengue fever and Zika virus³².

Indeed, humans need to intervene, calculate, control and eliminate one species while supplementing another, just like scientists use genetically modified mosquitoes to control mosquito populations. Artificial meat, the meat of the future world? Currently, there are around 170 companies worldwide developing and producing lab-grown meat. Good Meat, a leading US-based company, is selling lab-grown meat commercially, estimating that the new bioreactors will be able to supply 13,700 tonnes of chicken or beef to the market each year³³. In the future, the amount of meat produced in bioreactors will need to be scaled up. We also need to aim for a future where lab-grown meat is not just supplied by manufacturers but is produced by everyone to meet the needs of both humans and animals that eat meat, to prevent them from killing other species.

Therefore, with the above measures to protect the wild, we will develop ecosystems and create living environments for wildlife by planting more fruit trees to provide food for both humans and animals. With the active intervention of humans, all species will live together peacefully.

³⁰ All Graduate Theses and Dissertations, Seidler, Renee (2009), *Surgical Sterilization of Coyotes to Reduce Predation on Pronghorn Fawns*, website: <https://digitalcommons.usu.edu/etd/306>

³¹ VTV News (2016), *Genetically modified mosquitoes - a solution to prevent the Zika virus*, website: <https://vtv.vn/tin-tuc/muoi-bien-voi-gen-giai-phap-ngan-chan-virus-zika-20160130172857931.htm>

³² VTV News (2017), *Florida releases 20,000 genetically modified mosquitoes to fight Zika virus*, website: <https://vtv.vn/suc-khoe/my-florida-tha-20000-con-muoi-bien-voi-gen-de-chong-zika-201705050938121>

³³ VnExpress (2022), *Build a factory that produces 13,700 tons of artificial meat per year*, website: <https://vnexpress.net/xay-nha-may-san-xuat-13-700-tan-thit-nhan-tao-moi-nam-4468335.html>



Human intervention in nature for biodiversity conservation (Source: Internet)

4. Educational communication

Currently, Vietnam is considered one of the 16 countries with the highest biodiversity, with many rare and endemic species listed in the World Red Book. However, wild animal and plant species in Vietnam are facing a very high risk of extinction. The main cause is not only due to habitat loss, but also due to illegal hunting, trading, and use of wild animals, as well as related to the conservation of ferocious predators.

As long as humans do not recognize and realize the danger of conserving ferocious predators, still view them as wild animals and insist on extreme conservation, the damage that they bring to this planet, the Earth, in the near future cannot be underestimated. To protect these invaluable resources, in addition to implementing laws and conserving wild animals in a smart and selective manner, raising public awareness of the danger of conserving ferocious predators and precautions against their attacks through education and communication is also considered one of the important solutions that need to be implemented.

We need to educate the public about the consequences of conserving ferocious predators in a flexible, creative, and diverse way to make it more accessible and encourage practical support for state and international efforts to be vigilant against dangerous wild species.

We can organize competitions to learn about the dangers of conserving ferocious predators, intelligent and selective knowledge of wildlife protection and integrate many stories and messages to make it clear that conserving ferocious predators is a mistake, and from there, take many measures to be vigilant against these species.

Movies, documentaries, and reality TV programs involving famous people who speak out about the dangers of conserving ferocious predators and being vigilant against these species are also effective ways to communicate education and outreach to all layers of society. Literature, art, painting, music, etc., on intelligent and selective wildlife conservation, avoiding the protection of ferocious predator species, will surely have a natural attraction and strong spread, helping to make education and outreach more impressive and leave a deeper impression on the community.

From organizing conferences, publishing scientific research on the serious consequences of ferocious predator species to putting up widely spread propaganda posters, bringing up topics about the consequences of conserving ferocious predators in lively discussions in classrooms... are ways to help people awaken to the fact that conserving ferocious predators nowadays is a mistake, while providing effective measures to be cautious of these species.

Social organizations can launch communication campaigns, environmental action months integrating strong propaganda messages on special occasions with natural meanings such as International Day for Wildlife, Wild Plants 3/3, World Nature Conservation Day 28/07 contributing to creating a widespread ripple effect and helping people recognize the danger of conserving ferocious predators, avoiding serious damages that these species will cause in the future.

In addition, each citizen also has the responsibility to propagate and educate the community to understand the danger of conserving ferocious predators, to contribute to protecting Vietnam's ecological environment in the future, making it abundant, beautiful and diverse, and protecting all precious and diverse life on this planet.