Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company’s public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Policy analysis

Changes of China's regulatory regime on commercial artificial breeding of terrestrial wildlife in time of COVID-19 outbreak and impacts on the future

Mingqing You
Zhongnan University of Economics and Law, Wuhan, China

ARTICLE INFO

Keywords:
Terrestrial wildlife
Commercial artificial breeding
Regulatory regime
China

ABSTRACT

The basic attitude of Chinese law towards wildlife resources is differentiated protection plus rational utilizations. Artificial breeding of terrestrial wildlife was a big business and a way to alleviate poverty, but also raised concerns over wildlife conservation and public health. China's complete ban on the consumption of terrestrial wildlife, whether wild-sourced or artificially bred, was a drastic change of China's legal regime on wildlife conservation and commercial artificial breeding. This change will have impacts on the drafting of a new Biosafety Law and the revision and enforcement of the Wildlife Protection Law, the Husbandry Law, the Fisheries Law, and the Animal Epidemic Prevention Law.

1. Introduction

The coronavirus disease (COVID-19) has a far-reach impact on human life and wildlife conservation (Corlett et al., 2020). The virus that caused COVID-19 is zoonotic and is suspected to be from bats although the intermediate host(s) has not yet been identified (WHO, 2020). The high-risk human-wildlife interactions and interfaces are considered as a cause for the transmission of coronaviruses from wildlife to human beings (Daszak et al., 2020; Li et al., 2019). As part of the effort to reduce risks in human-wildlife interaction and interface, and to prevent possible epidemics in the future, China introduced a complete ban on the consumption of terrestrial wildlife, whether artificially bred or wild-sourced, and reaffirmed the prohibition on the consumption of other wildlife required by the existing law in February 2020. This is a drastic change of China's general attitude towards the protection and utilization of wildlife resources, and will affect the drafting of the Biosafety Law of the People's Republic of China (Biosafety Law) and the revision and enforcement of the Wildlife Protection Law of the People's Republic of China (Wildlife Protection Law), the Animal Epidemic Prevention Law of the People's Republic of China (Animal Epidemic Prevention Law), the Law of the People's Republic of China on Husbandry (Husbandry Law), the Fisheries Law of the People's Republic of China (Fisheries Law), and other laws. This change will greatly affect the commercial artificial breeding of terrestrial wildlife for food or food products and will promote wildlife conservation of China and other countries.

“Wildlife” is a term commonly used in science and technology as well as in law and policies. As a legal term, its meaning and scope change over time and vary from context to context. As discussed later in this paper, the legal definition of livestock and poultry may affect the meaning and the scope of wildlife. The same is true as to the differentiation between terrestrial wildlife and aquatic wildlife. Therefore, caution should be given that “wildlife”, “terrestrial wildlife”, “aquatic wildlife” and other related terms are used in the context of Chinese law.

This paper reviews China's existing legal regime on wildlife protection and commercial artificial breeding of terrestrial wildlife, the development of and concerns over commercial artificial breeding of terrestrial wildlife, the ban on consuming terrestrial wildlife, and the impacts on drafting new laws and the revision and enforcement of existing laws. This study of Chinese law may also be useful to other countries that have commercial artificial breeding of wildlife or other forms of utilization of wildlife resources.

2. China's existing legal regime on wildlife protection and commercial artificial breeding

For a long time, the general attitude of Chinese law towards wildlife is protection plus rational utilization. This basic attitude is deeply rooted in China's Constitution and embodied in relevant laws and regulations. The following paragraphs will address protection and utilization separately.

---

* Corresponding author at: Zhongnan University of Economics and Law, Wuhan, China.
E-mail addresses: you.mingqing@zuel.edu.cn, myou@tulane.edu.

https://doi.org/10.1016/j.biocon.2020.108756
Received 25 March 2020; Received in revised form 12 August 2020; Accepted 14 August 2020
Available online 22 August 2020
0006-3207/ © 2020 Elsevier Ltd. All rights reserved.
2.1. Protection of wildlife resources

The constitutional basis for wildlife protection is the state ownership of wildlife resources and the State’s responsibilities for environmental protection. State ownership means the subject matter is owned by the State, i.e., by the whole people. According to Article 9(1) of China’s Constitution, mineral resources, waters, forests, mountains, grassland, uncultivated land, beaches and other natural resources are owned by the State, with the exception of the forests, mountains, grassland, uncultivated land and beaches that are owned by collectives in accordance with the law. This constitutional provision does not expressly mention wildlife resources, but the Wildlife Protection Law declares in Article 3 that wildlife resources are subject to state ownership in line with this constitutional provision. Article 26 of the Constitution provides that the State has the constitutional responsibility to protect and improve the living environment and ecological environment. This requires the State to protect and improve wildlife as part of the ecological environment. The insertion of “ecological civilization” into the preamble to the Constitution by the 2018 amendment symbolizes the enhanced position of environmental protection in China.

The general attitude towards wildlife protection is differentiated protection. Article 9(2) of the Constitution singles out rare and precious animals for the State to protect. The Wildlife Protection Law provides the basic framework of differentiated protection based on rarity, risks of extinction, and value. This law classifies wildlife species into three categories: (1) rare or endangered wildlife, (2) wildlife with important ecological, scientific, or social value, and (3) the rest.

Rare or endangered wildlife are subject to special state protection (i.e., special protection at the national level) or special local protection (i.e., special protection at the provincial level). Those species subject to special state protection are further classified into first-class species and second-class species. The National Catalogue of Wildlife Species under Special Protection specifically lists the rare or endangered species under special state protection. The Wildlife Protection Law authorizes the competent authorities under the State Council in charge of wildlife protection to publish this catalogue with the approval of the State Council. The competent authorities shall make scientific study before making the list and shall adjust the list every five years based on scientific study. According to the division of work among ministries and commissions under the State Council, the National Forestry and Grassland Administration (NFGA) (formerly the Ministry of Forestry, MOF; the National Forestry Administration, NFA) is responsible for the protection of terrestrial wildlife while the Ministry of Agriculture and Rural Affairs (MARA) (formerly the Ministry of Agriculture, MOA) is responsible for the protection of aquatic wildlife. Accordingly, the competent authorities for making this national catalogue are the NFGA and the MARA. The former China MOF and the former China MOA jointly issued, with the approval of the State Council, the National Catalogue of Wildlife Species under Special Protection on January 14, 1989 (China MOF and China MOA, 1989). The former NFA issued an adjustment of this national catalogue on February 21, 2003, with the approval of the State Council (China NFA, 2003a). The last adjustment of this catalogue was made by the NFGA on June 5, 2020 to upgrade Chinese pangolin (Manis spp.) from second-class to first-class (China NFGA, 2020a). Local governments at the provincial level have authorities to make their local catalogue of wildlife under special protection. For instance, the People’s Government of Inner Mongolia published its local catalogue of terrestrial wildlife under special protection in December 2018 (General Office of the People’s Government of Inner Mongolia Autonomous Region, 2020).

Similarly, the Wildlife Protection Law authorizes the competent authorities under the State Council to make, adjust, and publish the catalogue of terrestrial wildlife species with important ecological, scientific, or social value based on scientific study. The former NFA issued this catalogue on August 1, 2000 (China NFA, 2000). Aside from this listing requirement, there are no strong legal requirements in place for species listed in this catalogue. For instance, snakes are listed in this catalogue but some are over-exploited to the state of being vulnerable, endangered, or critically endangered (Zhao, 2010; Zhou and Jiang, 2004). The NFGA is considering the revision of this catalogue. Some species in this catalogue are cross-listed by local governments as species under their special protection. For instance, Canis lupus, Vulpes vulpes, Vulpes corsac, and Nyteteres procyonoides are also on the Inner Mongolian local list of special protection (General Office of the People’s Government of Inner Mongolia Autonomous Region, 2020). If so, they will be subject to additional protection.

Wildlife species under special state protection are generally not allowed for hunting, catching, or killing. The Wildlife Protection Law only permits some exceptions, including scientific research, population control, monitoring sources of epidemics and diseases, and other special purposes. Even for these exceptions, a special hunting and catching license should be applied from the national authorities for first-class wildlife under special state protection or the provincial authorities for second-class wildlife under special state protection. The Wildlife Protection Law also generally prohibits the sale, purchase, and utilization of wildlife under special state protection or their products. The allowable exceptions are for scientific research, artificial breeding, public exhibition, cultural relic preservation, and other special purposes, and subject to the approval of the wildlife protection authorities at the provincial level. Special identifiers shall be obtained and used to ensure traceability.

In contrast with wildlife under special state protection, the Wildlife Protection Law protects other wildlife mainly with requirements on hunting licenses, hunting tools, hunting methods, timing of hunting, and allowable quotas. The licenses for hunting wildlife not under special state protection are issued by authorities of wildlife protection at or above the county level. The Wildlife Protection Law permits the sale, purchase, and trade of wildlife not subject to special state protection but requires legitimate proof of origin such as hunting licenses and import-export licenses.

The criminal liabilities are also differentiated between wildlife under special state protection and other wildlife. Under the Chinese Criminal Law, illegal hunting, killing, sales, purchase, trade, and trafficking of wildlife or wildlife products under special state protection may trigger terms of imprisonment from 5 to 10 years. Serious violations may trigger a term of imprisonment from 5 to 10 years. In contrast, for wildlife not under state protection, the criminal liability is limited to illegal hunting with unallowable tools or methods, or at unallowable time or place, and the maximum penalty is a 3-year imprisonment.

China is a signatory of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and has the duty to implement this convention with domestic law. According to Article 35 of the Wildlife Protection Law, China’s national authorities on the import and export of endangered species shall issue and adjust the list of wildlife and wildlife products prohibited or restricted for international trade by international treaties or conventions entered or acceded by China. This in effect requires China’s CITES office to publish and update the list of wildlife species prohibited or restricted for international trade. The same legal provision authorizes the wildlife protection authorities under the State Council to approve that certain species prohibited or restricted for international trade shall be regulated as species under special state protection in the sense of the Wildlife Protection Law. Certain CITES-listed species are indeed managed as first-class or second-class species under the Wildlife Protection Law. For instance, the MARA approved that certain CITES-listed aquatic wildlife shall be regulated as wildlife species under special state protection according to the Wildlife Protection Law in November 2018 (China MARA, 2018). The Criminal Law also punishes the smuggling of CITES-listed species, whether for consumption or for other purposes. The criminal liability for smuggling CITES-listed wildlife or wildlife products is a termed imprisonment between 5 and 10 years. For serious
commercial purposes, are subject to administrative licensing and other requirements. According to the Wildlife Protection Law and its implementation rules, the licensing authorities for first-class terrestrial wildlife under special state protection are wildlife protection authorities at the provincial level. Artificial breeding of wildlife under special state protection shall use artificially bred progeny provenance, and establish species pedigree, breeding files, and individual data. In the sense of the Wildlife Protection Law, artificially bred progeny refers to progeny individuals born under artificially controlled conditions and whose parents are also born in such conditions. The Wildlife Protection Law authorizes the authorities of wildlife protection under the State Council to make a list containing wildlife species under special state protection for which the artificial breeding techniques are mature and stable. The former NFA announced the first batch of 9 such terrestrial wildlife species in June 2017 (China NFA, 2017). Except Heosemys grandis, all other 8 species were also listed in the list of 54 wildlife species capable of commercial artificial breeding issued by the former NFA in August 2003 (China NFA, 2003b). The August 2003 list was repealed by the former NFA in December 2012 (China NFA, 2012). In terms of law, the difference between June 2017 list and August 2003 list is that the June 2017 list is limited to terrestrial wildlife species under special state protection while the August 2003 list also covers some species not under special state protection. As to wildlife not under special state protection, the current Wildlife Protection Law does not require administrative licensing for commercial artificial breeding.

Under the Wildlife Protection Law, it is legal to sell, trade, and buy artificially bred wildlife or their products to make food or food products. As to wildlife species under special state protection, the seller shall be a lawful commercial artificial breeder and the wildlife to be sold or utilized shall be attached with a special identifier to ensure the traceability of artificially bred wildlife and wildlife products. Commercial artificial breeders may get special identifiers from authorities of wildlife protection at the provincial level by presenting their artificial breeding licenses. The authorities verify the applicant’s annual quantity of production and issue an equal number of identifiers. As to wildlife not under special state protection, the Wildlife Protection Law does not require special identifiers for sale and utilization, but still requires legitimate proof of origin such as hunting licenses and import-export documentation for transportation across county borders.

3. Development of and concerns over commercial artificial breeding of terrestrial wildlife

3.1. Development of commercial artificial breeding of terrestrial wildlife

Similar to the fast development of wildlife farming in other countries (van Schalkwyk et al., 2010), commercial artificial breeding of wildlife developed quickly in China in the past decades. In some places such as Yunnan, Heilongjiang, Jiangsu, Jiangxi, and Hainan Provinces, commercial artificial breeding of terrestrial wildlife developed into a special industry for rural development and poverty alleviation (China NFGA, 2019; Xiao et al., 2018; Zhang et al., 2017). In 2018, the artificial breeding and utilization of terrestrial wildlife as a first industry reached 50,886.9 million Yuan (around 7270 million US dollars), and the production of food, fur, and other products as a second industry reached 28,983.74 million Yuan (around 4140 million US dollars) (China NFGA, 2019). The two biggest commercial purposes of artificial breeding are food and pharmacy. The government encouraged commercial artificial breeding of wildlife partly for rural development and poverty alleviation and partly for wildlife conservation (China NFA, 2004). However, legal rules permitting commercial artificial breeding of wildlife are not completely welcomed because of risks associated with commercial artificial breeding.

3.2. Risks to wildlife conservation

The Wildlife Protection Law regards commercial artificial breeding as a way to reduce the demand on the wild population and a way to help wildlife conservation. This law requires that artificial breeding shall be conducive to species conservation and scientific research and shall not jeopardize the wild population. However, the relationship between commercial artificial breeding and wildlife conservation is controversial (Abbott and van Kooten, 2011; Damania and Bulte, 2007; Xu et al., 2017; Zhang et al., 2017). Five criteria were proposed as conditions for commercial artificial breeding to have wildlife conservation effects: (1) legal products will form substitute; (2) demand is met and does not increase; (3) legal products will be more cost-efficient; (4) no re-stocking from the wild; and (5) laundering is absent (Tensen, 2016). Arguably, these five conditions are not completely met for all species allowed for commercial artificial breeding.

As to substitution, legal products did not completely form substitute. If consumers expressively ordered wildlife meat, they generally preferred “genuine” wildlife meat, which meant wildlife harvested from the wild, not products of artificial breeding. Consumers not only thought “genuine” wildlife meat had a better taste, but also thought it was more organic than the meat of artificially bred wildlife. One consideration of consumers was that “genuine” wildlife were not polluted by chemical fertilizers, herbicides, additives, and other chemicals while meat of artificially bred wildlife was regarded as polluted by chemicals. However, restaurants might pretend to serve “genuine” wildlife meat with meat of artificially bred wildlife and many consumers in fact could not distinguish the taste between “genuine” (wild-sourced) and “fake” (artificially bred) wildlife.

As to demand, there was a possible increase in demand. Consumers’ demand for wildlife meat varied from person to person, from place to place. Most Chinese did not regularly eat wildlife, whether wild-sourced or artificially bred. Still there was an increased demand for the meat of some wildlife (Zhou and Jiang, 2004), which might encourage poaching, drive up illegal international trade (McEvoy et al., 2019), and affect the wildlife conservation efforts of other countries.

As to the cost-efficiency of legalized wildlife products, the answer was generally positive. For species with developed techniques for breeding in captivity, the cost of commercial artificial breeding might be lower than harvesting from the wild. However, for species with less developed techniques for breeding in captivity, commercial artificial breeding might have a higher cost. Therefore, the cost of illegal harvesting of some species was still lower than commercial artificial breeding. A comparable situation was Vietnam. In Vietnam, lower cost was a major factor driving the trade in wild animals, with wild adult porcupines being bought for half the price of artificially bred adults (Brooks et al., 2010).

As to the restocking from the wild, the answer varied from species to species. The Wildlife Protection Law only permits commercial artificial breeders to use artificially bred progeny provenance for commercial...
artificial breeding. In practice, some artificial breeders still relied on wild population for breeding purposes. There are no hard data on the situation of China. The data of Southeast Asian countries may shed light on this situation. In Vietnam, commercial artificial breeding farms are also required to breed with artificially bred progeny provenance. However, in an investigation, 58% of farm owners admitted purchasing wild founder stock, with at least 19% continuing to buy wild individuals (Brooks et al., 2010).

As to laundering of illegal wildlife, this was also a big concern. At the sources of trade, commercial artificial breeders might exaggerate their wildlife population to fraudulently apply for more identifiers to launder catch from the wild population. In the resale process, wildlife might be sold without an identifier because law enforcement officers at food markets could not detect all sales of wildlife without an identifier. Currently there are no systematic data for wildlife laundering through commercial artificial breeding but the situation of other Asian countries suggested that wildlife laundering was a big concern in China (Lyons and Natusch, 2011).

3.3. Health risks

Commercial artificial breeding of wildlife may pose health risks to other animals and the human being. The health risks to the human being mainly lie in the transmission of zoonotic diseases. Zoonotic diseases are infectious and can be caused by bacteria, parasites, fungi, viruses, prions, and other pathogenic agents that are naturally transmitted from vertebrate mammals to humans and vice versa (Can et al., 2019; Wang and Crameri, 2014). The current COVID-19 outbreak is believed to be caused by zoonotic virus (WHO, 2020), so were SARS, MERS, and avian influenza (Wang and Crameri, 2014). In general, commercial artificial breeding of wildlife poses more health risks than livestock husbandry and poultry raising.

Epidemic control requirements are conditions for commercial artificial breeding of wildlife. Both the Wildlife Protection Law and the Animal Epidemics Prevention Law have relevant requirements on quarantine and epidemic control. In addition, both the NFGA and the MARA issued their ministerial rules on the quarantine of terrestrial wildlife. The latest rule was issued by the MARA in April 2019. Local authorities for wildlife protection and veterinary medicine also issued their departmental rules. Read together, artificial breeders need to have quarantine and epidemic control measures in their facilities, artificial breeders and hunters need to follow quarantine rules to get their artificially bred wildlife or hunted wildlife transported out of their county; carriers, buyers, traders of wildlife also need to check the proof of quarantine. However, a detailed study of these rules and practice may reveal some concerns. The biggest concern is the limited number of veterinarians. Veterinary medicine and veterinarians are under the authorities of the MARA. The limited number of veterinarians focus their work on swine fever, avian influenza and other epidemics of livestock and poultry. The quarantine check of wildlife is mainly for import and export. This makes the quarantine check for commercial artificial breeding facilities more difficult than livestock and poultry farms.

4. China’s complete ban on the consumption of terrestrial wildlife

4.1. Legal rules banning the consumption of terrestrial wildlife

China’s complete ban on the consumption of terrestrial wildlife was introduced by the decision of February 24, 2020 of the Standing Committee of the National People’s Congress (NPC), the top legislature of China (“China’s Legislature Adopts Decision on Banning Illegal Trade, Consumption of Wildlife”, 2020; NPC Standing Committee, 2020a). This Decision has legal force but is not a “law” in the sense of China’s Legislation Law. It is necessary to incorporate this prohibition when drafting the new Biosafety Law or revising the Wildlife Protection Law or other relevant laws. Before adopting the new law or revising existing laws by the NPC or its Standing Committee, local legislatures, local governments, and administrative agencies at the national level may act first. So far, local legislatures of Tianjin City (February 14, 2020) (The Standing Committee of the People’s Congress of Tianjin City, 2020), Hubei Province (March 5, 2020) (Standing Committee of the Hubei Provincial People’s Congress, 2020), Guangdong Province (March 31, 2020) (Standing Committee of Guangdong Provincial People’s Congress, 2020), Shenzhen Special Economic Zone (April 1, 2020) (Standing Committee of Shenzhen SEZ People’s Congress, 2020), Beijing (April 24, 2020) (Standing Committee of Beijing City People’s Congress, 2020), and some other provinces or cities have adopted or revised their local legislations accordingly. Other provinces, cities, and autonomous regions are expected to follow soon. Various Chinese administrative agencies at the national level also adopted implementation rules, particularly the NFGA (February 27, 2020) (China NFGA, 2020b). Even before this general ban of consumption, the Chinese State Administration for Market Regulation (SAMR), the MARA, and the NFGA jointly issued a notice to ban the trade of wildlife on January 26, 2020 (China SAMR et al., 2020).

It should be noted that even before the February 2020 Decision of the NPC Standing Committee, the Wildlife Protection Law and other laws already prohibited the consumption of certain wildlife. The February 2020 Decision of the NPC expanded the scope of prohibition as well as reaffirmed the prohibition provided in pre-existing laws. The scope of prohibition is further discussed below.

4.2. Coverage of wildlife banned for consumption

According to the February 2020 Decision of the NPC Standing Committee, the scope of prohibition for consumption covers all terrestrial wildlife, whether wild-sourced or artificially bred, and wild-sourced aquatic wildlife under special state protection. To be specific, the affirmed scope of prohibition includes: (1) wild-sourced terrestrial wildlife under special state protection, and (2) wild-sourced aquatic wildlife under special state protection. The affirmed scope was previously provided in the Wildlife Protection Law, which defines the scope of wildlife prohibited for consumption with two conditions: being under special state protection and being wild-sourced. The expanded scope includes: (1) wild-sourced terrestrial wildlife not under special state protection, (2) artificially bred terrestrial wildlife under special state protection; and (3) artificially bred terrestrial wildlife not under special state protection. Consequently, wildlife allowable for consumption include: (1) artificially bred aquatic wildlife under state protection, (2) wild-sourced aquatic wildlife not under special state protection, and (3) artificially bred aquatic wildlife not under special state protection (see Fig. 1).

As to CITES-listed wildlife, all terrestrial wildlife are banned for consumption by the February 2020 Decision, whether wild-sourced or artificially bred. The words “complete ban” and “other terrestrial wildlife” in the February 2020 Decision make the consumption ban applicable to artificially bred terrestrial wildlife of species listed in CITES Appendices. In contrast, the protection of CITES-listed species was confined to the wild population before the February 2020 Decision of the NPC Standing Committee. However, the crime of smuggling CITES-listed species is still confined to the wild population even after the February 2020 Decision.

According to the February 2020 Decision, all hunting, trade, and transportation of free roaming terrestrial wildlife for edible purposes are prohibited. This is in addition to the prohibition of hunting, trade, transportation, and consumption of wildlife under special state protection required by the Wildlife Protection Law and other laws (see Fig. 1).
4.3. Law enforcement measures

Penalties for breaching the consumption ban are not directly and specifically provided in the February 2020 Decision of the NPC Standing Committee. This Decision has two articles on legal penalties. The first article addresses the consumption of wild-sourced wildlife under special state protection. For such violations, this Decision requires more severe penalties than those provided by the existing law. The second article addresses the consuming of other wild-sourced terrestrial wildlife and artificially bred terrestrial wildlife, and requires imposing penalties in light of current laws (NPC Standing Committee, 2020a). However, both articles are still unclear and insufficient for the imposition of penalties. Local legislations of Beijing City (Standing Committee of Beijing City People's Congress, 2020), Shenzhen SEZ (Standing Committee of Shenzhen SEZ People's Congress, 2020), and Shanxi Province (revised on March 31, 2020) (Standing Committee of Shanxi Provincial People's Congress, 2020) impose administrative fines on persons hunting or killing terrestrial wildlife for food, on diners knowingly eating food made with terrestrial wildlife or wildlife product as well as on restaurants, catering service providers, and other entities providing food or food products made with terrestrial wildlife or their products. The Jiangxi Provincial Government issued local rules on March 9, 2020 imposing administrative fines for same violations (Jiangxi Provincial People's Government, 2020).

The law enforcement is comprehensive and covers the whole process from hunting, killing, breeding, trading, transporting with vehicles or via postal/courier services, manufacturing for food products, making food with wildlife or wildlife products, and finally eating wildlife or wildlife products. The NFGA and local bureaus have the main law enforcement duties. They need to close all facilities that artificially breed terrestrial wildlife for food purposes, or that produce food products with wildlife or wildlife products. If such facilities hold a legitimate administrative license, the authorities for forestry and grassland need to revoke their licenses. Besides the NFGA and local bureaus, various other administrative agencies have duties in related law enforcement. For instance, the SAMR (formerly the State Administration of Industry and Commerce, SAIC) and local bureaus of market regulation are responsible for markets, restaurants, advertisement, and other affairs. The SAMR is also responsible for inspection and quarantine of goods in the domestic market while the General Administration of Customs is responsible for the entry-exit inspection and quarantine. The authorities for transportation, postal and courier services, railway, and civil aviation have authorities to check the legality of wildlife or wildlife products transported or carried by passengers. The NFGA and local bureaus need to cooperate with them to ensure the elimination of consuming terrestrial wildlife.

Compared with blackletter legal rules, the enforcement features are equally, if not more, important. Constrained by limited law enforcement resources and other factors, local governments and their law enforcement agencies are incapable of performing all of their overwhelming responsibilities in law enforcement and governmental services. Selective law enforcement is inevitable and often rationally prioritized for issues stressed by higher authorities. The February 2020 Decision of NPC Standing Committee gave local authorities a strong signal to diligently and stringently enforce laws related to wildlife protection.

4.4. Treatment of artificially bred wildlife and compensation for artificial breeders

Artificially bred wildlife may be a potential source to increase wild population but may also disrupt the ecological system and cause other environmental problems. The NFGA issued a guideline on the handling of artificially bred wildlife in captivity on May 27, 2020 (China NFGA, 2020c). This technical standard offers four options for handling artificially bred wildlife: (1) to release to the wild; (2) to shift to other legitimate use; (3) to be used for genetic resources protection or to be kept in interim captive breeding facilities; and (4) to dispose in environmentally sound manner. This guideline encourages releasing native species into the wild and requires careful steps to ensure the released wildlife do not jeopardize the health of the wild population, do not pose unacceptable risks to the ecological system and human beings, and meet other conditions. If the artificially bred wildlife capable of being used for pharmacy, exhibition, or other acceptable purposes, this guideline encourages governmental agencies to facilitate the shift and grant necessary administrative licenses. Artificially bred wildlife of high quality may be transferred to qualified institutions for species conservation. Qualified institutions may temporarily take care of artificially bred wildlife abandoned by their owners for future legitimate use. The last option is to kill and dispose of artificially bred wildlife in environmentally sound manners.

It may be a great financial burden for local governments to compensate artificial breeders of wildlife for food. To a lawfully established commercial artificial breeding facility engaged in artificial breeding of edible wildlife, the February 2020 Decision of the NPC Standing Committee and implementation rules in effect constitute a regulatory taking. The NFGA's implementation rules require local authorities to revoke administrative licenses of commercial artificial breeders of wildlife for food (China NFGA, 2020b). According to China's Administrative Licensing Law, administrative license holders are entitled to
compensation for their economic losses when their licenses are revoked or modified because of a change of law. The government needs to compensate for the revocation of administrative licenses and necessary costs to prepare for the release of artificially bred wildlife to the wild. Some provinces published their compensation arrangements. For instance, Hunan Provincial Government issued the first compensation arrangement on May 14, 2020 (Hunan Provincial People's Government, 2020), Guangzhou City followed on June 3, 2020 (Hunan Provincial People's Government, 2020). Other local governments are expected to issue their compensation arrangements in the coming months. The arrangements of Hunan Province and Guangzhou City indicate that local governments at the county or district level bear the largest share of the financial burden for compensation. Compensation is limited to qualified artificial breeding entities, at the prescribed prices, and mainly based on the quantity of current stock of artificially bred terrestrial wildlife. In addition to administrative license holders, Hunan province allows for compensation to those artificial breeders who submitted an application for artificial breeding license on or before February 24, 2020 and met the legal requirements to get an artificial breeding license. Illegal artificial breeders who were ordered to close their facilities before February 24, 2020 are not entitled to compensation. The biggest controversy is the prices of compensation. Artificial breeders complain that the prices are too low to cover their losses, but something is still better than nothing.

5. Impacts on drafting, revision, and enforcement of laws

The February 2020 Decision of the NPC Standing Committee does not only prompt the revision of the Wildlife Protection Law, but also affects the enforcement and revision of other laws, notably the Husbandry Law, the Fishery Law, and the Animal Epidemics Prevention Law as well as the drafting of the Biosafety Law.

5.1. The wildlife protection law

The Wildlife Protection Law was adopted in 1988 and was revised or amended in 2004, 2009, 2016, and 2018. The February 2020 Decision prompts yet another revision. At least the following revisions are needed:

First, the legislative purpose should be changed to reflect concerns over public health and wildlife conservation. The current Article 1 provides that the legislative purposes are to protect the wildlife, save wildlife species that are rare or near extinction, maintain biodiversity and ecological balance, and promote the development of ecological civilization. The current Wildlife Protection Law does not give sufficient consideration to wildlife conservation, and even less to public health. The NPC Standing Committee realized this insufficiency (“NPC Team Inspected Guangdong”, 2003) and plans to revise the Wildlife Protection Law as part of legislations for public health (Wang, 2020). The current basic framework of differentiated protection plus rational utilization needs to be changed because wildlife conservation does not only require the protection of rare and endangered species. After the consumption ban, commercial artificial breeding of terrestrial wildlife for other purposes is still allowed. This may still pose risks to public health and wildlife conservation. A revision of legislative purposes is necessary to leave room for an overhaul of this law.

Second, revision is needed to expand the scope of prohibition on consumption and increase penalties. Specifically, the current Article 30 restricting consumption of wildlife needs to be revised to reflect the requirements of the February 2020 Decision. The current Chapter Four entitled “Legal Liabilities” should be revised to cover more violations and increase penalties.

Third, it is necessary to impose more restriction on commercial artificial breeding, particularly measures on quarantine and epidemic prevention, measures to avoid laundering, and measures ensuring traceability.

Fourth, it may be advisable to transfer the daily supervision of commercial artificial breeding from the authorities in charge of forestry and grassland to the authorities in charge of agriculture and rural affairs to better enforce quarantine requirements and to make veterinary medical services more readily available to commercial artificial breeders.

5.2. The husbandry law

The Husbandry Law was adopted in 2005 and amended in 2015. It is mainly enforced by the MARA and local authorities of agriculture and rural affairs. The enforcement of the Husbandry Law depends on the legal definition of livestock and poultry on the one hand and wildlife on the other hand. For the purpose of law enforcement, species listed as livestock or poultry are not wildlife. The legal definition of livestock and poultry is defined with the Catalogue of Livestock and Poultry Genetic Resources, which is published and updated by the MARA. The latest catalogue was published on May 27, 2020 (China MARA, 2020c) as part of the measures to implement the February 2020 Decision of the NPC Standing Committee. This new catalogue includes 17 traditional species of livestock and poultry and 16 special species of livestock and husbandry. *Cervus nippon*, *Cervus elaphus*, *Struthio camelus*, and some species previously listed as terrestrial wildlife by the NFGA or its predecessors are now listed as livestock or poultry. These species are allowed to be raised and consumed, not as wildlife, but as livestock or poultry after this clarification.

5.3. The fisheries law

The Fisheries Law was adopted in 1986 and was revised or amended in 2000, 2004, and 2013. It is also mainly enforced by the MARA and local authorities in charge of fisheries. Species regulated under the Fisheries Law are not terrestrial but aquatic in terms of law. In this sense, the legal definition and scope of aquatic species clarify the scope of terrestrial wildlife. The legal status of some reptiles and amphibians were unclear and troublesome. The former NFA once listed *Trachemys scripta*, *Macrolemys temminckii*, *Rana chensinensis*, *Rana amurensis*, *Rana grylio* and *Rana rugulosa* as terrestrial wildlife (China NFA, 2003b) while the former MOA listed *Trionyx sinensis*, *Chinemys reevesii*, and *Cuora trifasciata* as aquatic wildlife (China MOA, 2017, 2007). The February 2020 Decision of the NPC Standing Committee prompted the NFGA and the MARA to further clarify the legal status of amphibians and reptiles. In March 2020, the MARA clarified that *Trionyx sinensis*, *Chinemys reevesii* and other reptiles are to be regulated as aquatic animals under the Fisheries Law (China MARA, 2020b; China MOA, 2007). Then in May 2020, the MARA and NFGA jointly clarified that *Rana chensinensis*, *Rana amurensis*, and some frogs are also aquatic and to be regulated under the Fisheries Law (China MARA and China NFGA, 2020). However, the conservation issues do not disappear simply because they are classified as aquatic species in the law because negative impact of fish farming on turtles may still continue. Turtles are highly valued as food. Artificially bred turtles currently meet a large share of the demand but the wildlife population of some species are still in danger of being over-exploited (Feng, 2012; Gong et al., 2017; Ruan, 2014; Stanford et al., 2020).

5.4. The animal epidemic prevention law

The Animal Epidemic Prevention Law was adopted in 1997 and was revised or amended in 2013 and 2015. This law is applicable to livestock, poultry, and other animals artificially raised or lawfully captured. However, this law focuses on livestock and poultry and only expressly mentions wildlife in Article 47. This article provides that captured wild animals that are liable to spread animal epidemics shall be subject to quarantine by the animal health supervision institution at the place where the animals are captured, and they may be raised, marketed or transported only after they pass the quarantine. The legal
liabilities for violating this requirement is a sum of administrative fine. As to commercial artificial breeding, a weakness of this law is that its legal measures are more attuned to livestock and poultry than for wildlife. The February 2020 Decision of the NPC Standing Committee requires more and better attuned provisions on wildlife and commercial artificial breeding. This Decision also made local authorities prioritize animal epidemic prevention and enforce this law more diligently.

5.5. The biosafety law

Although proposed before the COVID-19 pandemic, the Biosafety Law is now expected to be drafted quicker and have stricter provisions. The NPC Standing Committee released its second draft to solicit public comments and had a second reading in April 2020 (NPC Standing Committee, 2020b), and expect to adopt this law in 2021. The Biosafety Law is to implement the notion of "comprehensive national security" (Liu, 2014) and to establish the precautionary principle and precautionary mechanisms for biosafety. In line with this notion of comprehensive national security, the second draft provides that it will be applicable to infectious diseases and epidemics, bio-technology, genetic resources, foreign species, safety of laboratories, micro-organisms, bioterrorism and bio-weapons, and other issues related to biosafety. This broad scope of application in effect indicates that the Biosafety Law will be more likely an umbrella legislation for biosafety, a legislation to coordinate other legislations and rules on bio-technology, bio-engineering, wildlife conservation, prevention of animal epidemics, and so on. As to wildlife, the second draft provides in Article 30 that the State protects wildlife, strengthens the prevention of animal epidemics, and prevent the spread of zoonotic infectious diseases. Overall, the second draft is still insufficient. The February 2020 Decision of the NPC Standing Committee and the nightmare of COVID-19 will make the NPC pay more attention to biosafety issues related to wildlife, including the biosafety issues related to commercial artificial breeding of wildlife, and make more provisions on the peaceful co-existence of human beings and wildlife.

6. Concluding remarks

Commercial artificial breeding of terrestrial wildlife was a big business in China and was once regarded as a rational utilization of wildlife resources and a way to alleviate poverty. A complete prohibition of consuming terrestrial wildlife, including the artificially bred terrestrial wildlife, is a drastic change of the legal regime on wildlife protection and commercial artificial breeding. To the society, it will cause a big economic loss; to the government, a big financial burden. China's willingness to bear this big loss and financial burden indicates China's determination to protect public health and promote wildlife conservation. The enforcement of wildlife conservation rules involves many administrative agencies. Only coordinated and conscientious law enforcement can achieve the goals required by the NPC Standing Committee in its February 2020 Decision. Capacity building, particularly the number and proficiency of village veterinarians, is clearly needed because law enforcement largely depends on the availability of high-quality veterinary medical services. Wildlife is a complicated legal issue in China. Many issues are not address here and further research is needed in the future.

Funding

The National Social Science Fund of China (Project Nos: 202DA090 and 15BFX181), the Fundamental Research Funds for the Central Universities administered by Zhongnan University of Economics and Law (Project No.: 2722019PY001), and Green Anhui Environmental Consultation Center.

Declaration of competing interest

There is no conflict of interest and no dispute of intellectual property rights. It is the result of independent academic research and does not necessarily reflect the views of the authors’ funders or affiliations.

References

Abbott, B., van Kooten, G.C., 2011. Can domestication of wildlife lead to conservation? The economics of tiger farming in China. Ecol. Econ. 70, 721–728. https://doi.org/10.1016/j.ecol econ.2010.11.006.
Brooks, E.G., Roberton, S.L., Bell, D.J., 2010. The conservation impact of commercial wildlife farming of porcupines in Vietnam. Biol. Conserv. 143, 2608–2614. https://doi.org/10.1016/j.biocon serv.2010.07.030.
Bulte, E.H., Damanis, R., 2005. An economic assessment of wildlife farming and conservation. Conserv. Biol. 19, 1222–1233.
Can, O.E., D’Crane, N., Macdonald, D.W., 2019. Dealing in deadly pathogens: taking stock of the legal trade in live wildlife and potential risks to human health. Glob. Ecol. Conserv. 17, 1–18. https://doi.org/10.1016/j.gecco.2018.e00515.
China MARA, 2018. Lists of CITES-Listed Aquatic Wildlife to be Regulated as Wildlife Under Special State Protection (MARA Public Announcement No. 69) [WWW Document]. URL http://www.moa.gov.cn/gk/tzgg/1/gg/201810/t20181015_6160721.htm.
China MARA, 2020a. China’s National Catalogue of Genetic Resources of Livestock and Poultry [WWW Document]. URL http://www.moa.gov.cn/govpublic/nybzejz/202005/ct20200529.6345518.htm.
China MARA, 2020b. Public Notice of the Ministry of Agriculture and Rural Affairs on the Implementation of the Decision of the NPC Standing Committee on a Complete Ban on Illegal Wildlife Trade and Elimination of the Bad Habit of Absurdly Consuming Wildlife to Effectively Safeguard People’s Lives and Health [WWW Document]. URL http://www.moa.gov.cn/govpublic/YYJ/202003/t20200305_638204.htm.
China MARA, China MFA, 2020. Notice on Further Streamlining the Protection and Administration of Flogs [WWW Document]. URL http://www.forestry.gov.cn/hljb/4994/20200529/130449843921406.html.
China MOA, 2007. The Catalogue of Aquatic Flora and Fauna Resources with Economic Value and under Special Protection [WWW Document]. URL http://www.moa.gov.cn/govpublic/YYJ/201005/6201006066_1538153.htm.
China MOA, 2017. Catalogue of Aquatic Wildlife Species under Special Protection at National Level and Capable of Artificial Cultivation (the First Batch) [WWW Document]. URL http://www.moa.gov.cn/nybzh/2017/2017012/20180202/6136346.htm.
China MOF, China MOA, 1989. China’s National Catalogue of Wildlife Species under Special Protection. [WWW Document]. URL http://www.forestry.gov.cn/main/3954/content-1063883.htm.
China NFA, 2000. China’s Catalogue of Terrestrial Wildlife Species with Ecological, Scientific, or Social Value [WWW Document]. URL http://www.forestry.gov.cn/main/5461/2000/120100611_9252578.htm.
China NFA, 2003a. Adjustment to the National Catalogue of Wildlife Species under Special Protection [WWW Document]. State Counc. Gaz. URL http://www.forestry.gov.cn/sey/gpsb/content/2003/12013318_62288.htm.
China NFA, 2003b. Notice Announcing the List of 54 Terrestrial Wildlife Species Capable of Commercial Utilization and Breeding [WWW Document]. URL http://www.forestry.gov.cn/main/5461/20030805/796749.htm.
China NFSA, 2004. Guidelines on the Promotion of Sustainable Development of Wild Flora and Fauna [WWW Document]. URL http://www.forestry.gov.cn/sites/main/main/gov/content.jsp?TID=1079.
China NFSA, 2012. NFA Public Notice on the Checking of Normative Documents (NFA Public Notice [2012] 9) [WWW Document]. URL http://www.forestry.gov.cn/sites/main/main/gov/content.jsp?TID=1963.
China NFSA, 2017. List of Wildlife under Special State Protection and Capable of Artificial Breeding [WWW Document]. URL http://www.forestry.gov.cn/xinwen/2017-07/06/content_5285376.htm.
China NFSA, 2019. China Forestry and Grassland Yearbook 2019. China Forestry Press, Beijing.
China NFSA, 2020a. Announcement of China NFSA on Adjustment of Protection Level of Pangolin (No. 12 of 2020, June 3, 2020) [WWW Document]. URL http://www.forestry.gov.cn/main/5461/20200611/9252112948854.htm.
China NFSA, 2020b. Notice of National Forestry and Grassland Administration on the Implementation of the Decision of the NPC Standing Committee on a Complete Ban on Illegal Wildlife Trade and Elimination of the Bad Habit of Absurdly Consuming Wildlife to Effectively Safeguard People’s Lives and Health [WWW Document]. URL http://www.forestry.gov.cn/main/5461/20200302/101125358271505.htm.
China NFSA, 2020c. Technical Standards on Appropriate Handling of Wildlife in Captivity [WWW Document]. URL http://www.forestry.gov.cn/main/5466/20200501/99414252166838.htm.
China SAMR, China MARA, China NFSA, 2020. Public Announcement on the Prohibition of Wildlife Trade (January 26, 2020) [WWW Document]. URL http://gkml.samr.gov.cn/njys/wjxx/202001/t20200128_310742.html.
China’s Legislature Adopts Decision on Banning Illegal Trade, Consumption of Wildlife. [WWW Document]. URL http://www.xinhuanet.com/english/2020-02/24/c_138814139.htm.
Corlett, R.T., Primack, R.B., Devictor, V., Maas, B., Goswami, V.R., Bates, A.E., Koh, L.P., Regan, T.J., Loyola, R., Pakeman, R.J., Cumming, G.S., Fidgerson, A., Johns, D., Roth,
R., 2020. Impacts of the coronavirus pandemic on biodiversity conservation. Biol. Conserv. 246, 8–11. https://doi.org/10.1016/j.biocon.2020.108571.

Damauria, R., Bulte, E.H., 2007. The economics of wildlife farming and endangered species conservation. Ecol. Econ. 62, 461–472. https://doi.org/10.1016/j.ecolecon.2006.07.007.

Daszak, P., Olival, K.J., Li, H., 2020. A strategy to prevent future epidemics similar to the 2019-nCoV outbreak. Biosaf. Heal. 10, 12–19. https://doi.org/10.1016/j.bsheal.2020.01.003.

Feng, H., 2012. Save Endangered Species Guangdong Turtle. Guangdong Technol. Dly. September 8, page 5.

General Office of the People’s Government of Inner Mongolia Autonomous Region, 2020. Catalogue of Terrestrial Wildlife under Special Protection of Inner Mongolia [WWW Document]. URL http://www.nmg.gov.cn/2018/12/20/art_1686_244641.html.

Gong, S. Ping, Shi, H. Tao, Jiang, A. Wu, Fong, J.J., Gaillard, D., Wang, J. Chao, 2017. Disappearance of endangered turtles within China’s nature reserves. Curr. Biol. 27, R170–R171. https://doi.org/10.1016/j.cub.2017.01.039.

Hunan Provincial People’s Government, 2020. Arrangement on Compensation and Handling of Artificially Bred Wildlife After the Ban on Consuming Terrestrial Wildlife (May 14, 2020) [WWW Document]. URL http://www.hunan.gov.cn/hnsfz/wscyj/20200515_12138955.html.

Jiangxi Provincial People’s Government, 2020. Rules of Jiangxi Provincial Government Banning Trade and Consumption of Wildlife (March 9, 2020) (Order of Jiangxi Provincial Government No. 244) [WWW Document]. URL http://www.jiangxi.gov.cn/ct/2020-4/1/art_4975_1696025.html.

Li, H., Mendelsohn, E., Zong, C., Zhang, W., Hagan, E., Wang, N., Li, S., Yan, H., Huang, H., Zhu, G., Ross, N., Chmura, A., Terry, P., Fielder, M., Miller, M., Shi, Z., Daszak, P., 2019. Human-animal interactions and bat coronavirus spillover potential among rural residents in southern China. Biosaf. Heal. 1, 84–90. https://doi.org/10.1016/j.bchreal.2019.10.004.

Liu, Y., 2014. Comprehensive National Security as a non-traditional view of National Security. Res. Int. Secur. 32, 3–25. https://doi.org/10.14093/j.cnki.cn10-1132/d.2014.06.001.

Lyons, J.A., Natusch, D.J.D., 2011. Wildlife laundering through breeding farms: illegal harvest, population declines and a means of regulating the trade of green pythons (Morelia viridis) from Indonesia. Biosol. Conserv. 144, 3073–3081. https://doi.org/10.1016/j.biocon.2011.10.002.

McEvoy, J.F., Connette, G., Huang, Q., Soe, P., Pyone, K.H.H., Valitutto, M., Htun, Y.L., Feng, H., 2012. Save Endangered Species Guangdong Turtle. Guangdong Technol. Dly. URL. http://paper.people.com.cn/fflff/202005/20200515_12138955.html.

NPC Standing Committee, 2020a. Decision of the Standing Committee of the National People’s Congress on the Forceful Striking on Illegal Wildlife Trade and Complete Ban on the Consumption of Wildlife to Effectively Safeguard People’s Lives and Health [WWW Document]. URL http://www.gov.cn/zhengce/2020-02/13/content_5474817.htm.

NPC Standing Committee, 2020b. Agenda of the 17th Meeting of the 13th NPC Standing Committee. (People’s Dly, February 25).

Standing Committee of the People’s Congress of Tianjin Municipality on the Ban on Consuming Wildlife [WWW Document]. URL http://www.tj.gov.cn/tjgb/zxdt/202002/t20200213_472. https://doi.org/10.1016/j.ecolecon.2020.108571.

Standing Committee of Tianjin Municipal People’s Congress, 2020. Public Announcement of the Standing Committee of Shanxi Provincial People’s Congress (No. 36, March 31, 2020) [WWW Document]. URL http://www.sxpc.gov.cn/zyfb/jyjd/202004/t20200401_19146346.htm.

Standing Committee of the People's Congress of Tianjin City, 2020. Decision of the Standing Committee of the People's Congress of Tianjin Municipality on the Ban on Consuming Wildlife [WWW Document]. URL http://www.tj.gov.cn/tjgb/zxdt/202002/t20200213_472. https://doi.org/10.1016/j.ecolecon.2020.108571.

Standing Committee of the Standing Committee of Shanxi Provincial People’s Congress, 2020. Administrative Rules on Wildlife Protection of Shanxi Province (Revised in 2020) [WWW Document]. URL http://www.sxxr.gov.cn/index.chc?mosId=102050200331_171539.html.

Standing Committee of Shenzhen SEZ People’s Congress, 2020. Rules of Shenzhen Special Economic Zone on Complete Prohibition of Consumption of Wildlife [WWW Document]. URL http://www.szrd.gov.cn/szrd_zyb/szrd_zyb_whgbs/b202004/t20200401_19146346.htm.

SPARC, 2020. Impacts of the coronavirus pandemic on biodiversity conservation. Biol. Conserv. 275, 3479–3499. https://doi.org/10.3390/m22113479.

TEAM, 2020. Standing Committee of Beijing City People’s Congress, 2020. Administrative Rules of Beijing City on Wildlife Protection [Revised 2020] [WWW Document]. URL http://www.byjd.gov.cn/cn/zwgk/yshbj/hjfc/b202005/b20200519_203481.html.

WHO, 2020. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). [WWW Document]. URL https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf.

Xiao, J., Fang, R., Liu, B., 2018. Investigation and evaluation of artificial breeding industry of wild animals in Yunnan Province. For. Ind. Plan. 43, 130–138.