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Contemporary Value of Ancient China's Wisdom in Managing Alien Species

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Abstract

As one of the top five direct drivers threatening global biodiversity, invasive alien species represent a pressing challenge that demands immediate resolution in China's ecological and environmental domains. The "15th Five-Year Plan" period marks a critical phase for advancing China's biosecurity, during which there is an urgent need to enhance the invasive species prevention and control system. By examining historical management philosophies from the Qin-Han and Ming-Qing dynasties, this analysis identifies current shortcomings in China's invasive species management, such as insufficient interdepartmental coordination, lack of independence in risk assessment, and regulatory lag in cross-border e-commerce oversight. Therefore, it is imperative to establish a centralized interdepartmental coordination mechanism, ensure the independence of risk evaluations, and strengthen cross-border supervision and penalties. Drawing on ancient wisdom in managing alien species can provide valuable insights for refining the contemporary invasive species prevention institutional framework, thereby helping to fortify ecological security barriers and foster harmonious coexistence between humanity and nature.

Keywords

Invasive Alien Species; Ecological Wisdom from Ancient Times; Cross-border E-commerce Regulation; Risk Assessment.

1. Introduction

The acceleration of globalization, coupled with the increasing frequency of international trade and cross-border exchanges, has significantly heightened the risk of invasive species, posing severe challenges to ecological security, biosecurity, and human health. Currently, more than 37,000 alien species have been introduced to various regions and biomes worldwide through human activities, of which over 3,500 have been identified as harmful invasive alien species.[1]At the 20th National Congress of the Communist Party of China (CPC), Comrade Xi Jinping explicitly stated the need to promote green development and foster harmony between humanity and nature. He emphasized enhancing the diversity, stability, and sustainability of ecosystems, which necessitates "strengthening biosecurity management and preventing the invasion of alien species."[2]

The outbreak of the COVID-19 pandemic highlighted increasingly grave biosecurity issues. Consequently, the Chinese government has placed growing importance on the prevention and control of invasive alien species and has begun to consistently implement management measures. In 2021, the Biosecurity Law of the People's Republic of China officially came into effect, which explicitly strengthened the prevention and control of invasive alien species as a critical measure for maintaining biodiversity. Furthermore, the Communiqué of the Fourth Plenary Session of the 20th CPC Central Committee in 2025 proposed to "build a solid barrier for ecological security" and "continuously deepen the fight against pollution and the

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optimization of ecosystems," charting the course for invasive species management during the upcoming "15th Five-Year Plan" period.[3]The "15th Five-Year Plan" period represents a critical window for China's biosecurity development. It is essential for the nation to fully implement the New Development Philosophy while drawing lessons from the experience and wisdom of ancient China in managing alien species to advance the great progress of this period.

Spanning five thousand years of history, the experiences of ancient China in biological invasion prevention offer significant references for contemporary management. From Zhang Qian's mission to the Western Regions during the Han Dynasty to the Maritime Silk Road of the Ming and Qing Dynasties, while continuously introducing diverse alien species, Chinese ancestors gradually developed management wisdom centered on concepts such as "centralized control" and "decentralized local management" regarding source control and governance. Therefore, this paper systematically examines the historical experience and contemporary value of ancient China's response to alien species, aiming to provide insights for the construction of a comprehensive prevention and control system for invasive species during the "15th Five-Year Plan" period.

2. Historical Practices of Alien Species Management in Ancient China

2.1. Objective Limitations on Alien Species via Tribute Screening

2.1.1. Official Designation of Import and Export Items

The Tang Dynasty inherited the institutional framework of the Sui Dynasty, establishing the Ministry of Rites (Li Bu) under the Department of State Affairs and the Court of State Ceremonial (Honglu Si) as the core agencies for foreign affairs. The Bureau of Receptions (Zhuke Si) under the Ministry of Rites was responsible for the "reception and tribute of various barbarian states." The Court of State Ceremonial managed diplomatic affairs through its subordinate offices, the Office of Protocol (Dianke Shu) and the Office of Ceremonies (Siyi Shu). According to the records on the disposal of tribute in Volume 48 of the New Book of Tang.[4]Local governments were required to inspect, register, and report tribute items carried by foreign missions to the Court of State Ceremonial for the record. Departments such as the Court of State Ceremonial, the Directorate for Imperial Manufactures, and the Court of the Imperial Stud would re-examine and appraise these items as a basis for "reciprocal compensation".[5]The Tang Dynasty did not accept all "tribute" indiscriminately; rather, it established clear screening and disposal rules. Items deemed "insufficient for presentation"—those failing to meet standards of value or specification—were detained at border prefectures and not sent to the capital. Some items, even upon reaching the capital, were returned for failing to meet specific regulations. Therefore, the Court of State Ceremonial's qualitative assessment of tribute constituted the first institutional "gate" for filtering alien living organisms in the Tang Dynasty, centralizing the power of entry adjudication within the central government.

Furthermore, tribute screening included restrictions on the entry of foreign envoys. Records in the*Tang Liudian*[6] and the*New Book of Tang*[7]regarding border passage for tribute missions indicate that upon entering the border, missions were verified by local prefectures, which issued a transit permit known as a "border certificate" .Moreover, the number of personnel allowed to enter the capital was strictly regulated.This not only obstructed the entry of alien living organisms but also limited the entry of "carrying sources" , thereby preventing the risk of invasive species to a certain extent. Through the dual-level document review of the Ministry of Rites and the Court of State Ceremonial, the Tang Dynasty institutionally blocked exotic living organisms that might carry pests or propagules, objectively performing a biosecurity screening function.

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2.1.2. Quantitative Restrictions and Monetary Substitution

2.1.2.1 Quotas on Tribute Numbers

The Ming Dynasty imposed explicit limits on tribute quotas, reflecting both fiscal and ecological considerations. Allowing vassal states to increase tribute at will would have drained the national treasury and increased the risk of epidemics in imperial stables and gardens. According to Volume 97 of the *Collected Statutes of the Ming Dynasty*: "Henceforth, only the King of Zhongshan is allowed to pay tribute once every two years, with 100 people per ship, not exceeding 150... and 50 breeding horses every three years." [8] Such measures placed the input of living organisms under a strict numerical ceiling; any individuals exceeding the quota had to be returned on the same ship at the port or border and were forbidden from landing. Similar restrictions on personnel and livestock are recorded in *Haiguo Sishuo*.[9]

These quotas primarily served the feudal ritual hierarchy, ensuring that the scale of tribute reflected the subordinate status of foreign states and the dignity of the Ming Empire. More critically, numerical ceilings objectively prevented alien species from reaching an "effective population size" sufficient for reproduction and expansion. Large animals like elephants and rhinos were often limited to one or two individuals, usually juveniles. High mortality rates during long-distance transport, random sex ratios, and the inability to breed in the short term meant that actual fertile individuals often fell below the genetic bottleneck threshold. This system filtered tribute species down to a "minimum viable population," significantly reducing the probability of species escape and invasion into local ecosystems.

2.1.2.2 The Monetary Substitution System

According to the *Account of Tribute Nations via Guangdong*: "Regarding Siamese tribute elephants, each elephant is converted to a value of 200 taels of silver, to be handed over at the border."[10]Within the framework of regular tribute, the "exchange of silver for goods" was explicitly permitted. This practice balanced ritual requirements with fiscal conservation; the court retained the symbolic value of the "elephant" while saving on the costs of long-distance feeding, the expansion of imperial elephant stables, and epidemic prevention. For the tributary state, it mitigated transport risks and allowed for the immediate purchase of desired goods at the border. More importantly, because live elephants did not enter the interior, the ecological uncertainty of large alien mammals was eliminated. Adult elephants, if they escaped or went into musth, could easily devastate farmland and irrigation systems or disrupt local megafauna habitats. By using fiscal levers to reduce the number of potential invasive individuals to zero, this system represented an institutional innovation in achieving biosecurity through financial means.

2.2. Objective Constraints of Imperial Garden Trial-Planting on Exotic Species

According to the "*Treatise on the Western Regions*" (Part II) in Volume 96 of the *Hanshu*:"...From then on, treasures such as bright pearls, patterned tortoise shells, rhinoceros horns, and kingfisher feathers filled the rear palaces; horses of the Pushao, Longwen, Yumu, and Hanxue (Blood-sweating) breeds filled the imperial gates; and herds of giant elephants, lions, fierce dogs, and large birds were fed in the outer enclosures. Exotic items from distant lands arrived from all directions. Consequently, the Shanglin Park was greatly expanded..."[11]

At that time, the national strength of the Western Han was at its zenith. Emperor Wu expanded the Shanglin Park based on the foundations of the Qin Dynasty's original park. As noted in the *Sanfu Huangtu* , "The Han Shanglin Park was the old park of the Qin." Consequently, the Shanglin Park of the Han Dynasty became the largest classical garden in Chinese history. [12] Given that many of these rare and exotic species originated from distant regions, the Han court conducted experimental planting within the park, a practice referred to as "trial cultivation in imperial gardens" (yuan-di shizhong).

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The *Sanfu Huangtu* further records:"In the sixth year of Yuanding, after the defeat of Nanyue, the Fuli Palace was constructed to plant the exotic grasses and trees obtained. One hundred lychee trees were transplanted from Jiaozhi, yet not a single one survived. For years, transplantation continued relentlessly; occasionally, a tree would flourish, but it ultimately bore no flowers or fruit. The Emperor cherished them deeply. Once, when a tree withered and died, ten supervising officials were executed. Thereafter, planting was abandoned, and the fruit was instead sent as annual tribute. The couriers were exhausted to the point of death along the roads, posing a grave hardship to the common people." *[12]*

These records regarding the transplantation of lychees to the Fuli Palace during the Western Han indicate that the survival rate was extremely low due to ecological constraints—such as climate, soil, and water quality—and the limitations of transplantation technology. Ultimately, the attempt proved unsustainable. Although "trial cultivation in imperial gardens" was designed to serve the royal family, the practice of confining alien species within the enclosures and preventing their escape into the wild effectively functioned as a form of management and control of alien species. Moreover, as evidenced by the lychee introduction records in the Sanfu Huangtu, a successful trial in the Shanglin Park would have signified the species' adaptation to the ecology of Chang'an, thereby serving as a prerequisite for expanding its cultivation range.

2.3. Objective Limitations on Alien Species via Border Control

2.3.1. Implementation of Rigorous Border Supervision Systems

Although there were no explicit legal statutes specifically codifying the management of alien species during the Ming and Qing dynasties, border policies were relatively comprehensive. In the context of alien species management, the role of border prevention and control was particularly prominent. Systems of customs passes , coastal defense , and postal relays were implemented in tandem, objectively forming a border defense line spanning both land and sea. The fundamental logic of this system was that all personnel, goods, livestock, plants, and their propagules entering or exiting the border were required to undergo inspection, registration, and licensing at officially designated ports. Any unauthorized entry or exit was met with severe penalties. Under the feudal system, these comprehensive and rigorous border regulations maximized the control over alien species.According to the *Bing Lv* of the *Da Ming Lv*:"If military officers, soldiers, or civilians at any border privately cross the frontier to hunt leopards, catch deer, fell timber, or trap rodents, and if the guards knowingly allow it, or if local elders, banner officers, or military clerks conspire to conceal such acts, they shall—with the exception of those committing capital offenses—be exiled to miasmatic regions (yanzhang di). Civilians and elders shall be reduced to commoner status, soldiers shall be pressed into military service, and officers shall be stripped of their stipends while performing hard labor."[13]

During the Ming Dynasty, military personnel and civilians were strictly prohibited from crossing the border without authorization. Those who did so for hunting or logging faced the death penalty, while those who concealed or abetted such acts were sentenced to exile. This demonstrates the extreme severity of border control. Furthermore, the "Military Laws" state: "...those who privately cross the border for trade or go to sea shall receive one hundred strokes of the rod; ...those who take people or military equipment across the border or to sea shall be executed by strangulation..." [13] Consequently, these strict border supervision policies served a dual purpose: they prevented the outflow of domestic rare species and obstructed the illegal importation of foreign living organisms.

2.3.2. Indirect Effects of the Maritime Ban Policy

During the Ming and Qing dynasties, the most significant policy regarding border control was the "Maritime Ban" , a cornerstone of the "closed-door" policy. In the late Yuan and early Ming dynasties, Japanese pirates engaged in armed smuggling and predatory raids along China's coast.[14] In response, during the Hongwu era, Emperor Zhu Yuanzhang implemented the

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Maritime Ban to prevent harassment by coastal warlord remnants and pirates. [15]To further prevent coastal rebel forces from conspiring with the Wokou, the Ming court successively abolished the Maritime Trade Supervisorates (Shibo Si) and issued "Sea Ban Orders."[16]

In the seventh year of Hongwu (1374), the Ming government abolished the Maritime Trade Supervisorates in Quanzhou (Fujian), Mingzhou (Zhejiang), and Guangzhou (Guangdong), which were responsible for overseas trade. During the Maritime Ban periods, regulations dictated that "not even a single plank is allowed into the sea," and even the construction of civilian fishing boats slightly larger than the prescribed specifications was considered a criminal act.[17] As recorded in the Great Ming Code:"Any official or civilian who unauthorizedly builds large ships with two or more masts to carry prohibited goods to foreign nations for trade, or who conspires with sea pirates... the primary offenders shall suffer the ultimate penalty, and their entire families shall be exiled to border garrisons. ... Those who privately purchase foreign goods such as sapanwood (sumu) or pepper in quantities exceeding one thousand catties shall also be exiled to border garrisons, and the goods shall be confiscated."[18]

The early Ming Maritime Ban primarily targeted commerce by restricting private citizens from going abroad for trade and limiting foreign merchants from trading in China, with the exception of official tribute missions. The implementation of the Maritime Ban led directly to a significant contraction of private import and export trade, which in turn indirectly suppressed the cross-regional trade, transport, and exchange of species. During the Yongle era, although Zheng He's voyages to the "Western Oceans" were grand in scale, they operated strictly within the state-led tribute trade system; private seafaring remained forbidden. Subsequently, as *Wokou* raids intensified, the Maritime Ban became increasingly draconian, nearly severing private international trade while allowing only the official tribute system to persist.

In specific historical periods, this policy played a self-protective role in resisting external threats and maintaining coastal security. Simultaneously, it affected the dissemination of knowledge and cultural exchange between Chinese and foreign populations. From an environmental perspective, this policy reduced the likelihood of alien species invasions into the Ming interior to a certain extent; however, this strict isolation also had multi-faceted impacts on the nation's overall development.

3. Concepts of Alien Species Management in Ancient China

3.1. Centralized Management and Control

From the perspective of the institutional structure of the Ming and Qing tributary systems, centralized control was the core design for maintaining the *Zongfan* order of the feudal dynasties; objectively, it served as the primary defensive barrier against the ecological invasion of alien species. According to the records in Four Accounts of Maritime Nations regarding the travel arrangements of foreign tribute missions,[19]the tributary system was one of the main channels through which ancient China introduced alien species. Since tribute items were mostly destined for imperial use, they consisted primarily of "rare and exotic" objects in limited quantities.

The fact that tribute species were characterized as "rare and exotic" implies that their populations in their original habitats were relatively small and specialized, possessing unique ornamental or functional value. Consequently, these species often possessed weaker ecological adaptability. Once brought to the imperial court, changes in soil, water, and climate often rendered their survival short-lived. Because the imperial court could not easily cultivate or breed these exotic species locally, foreign states were required to pay tribute annually to satisfy imperial demand. It was precisely this cultural veneration for "exotic objects from distant lands" that stripped these species from their native ecosystems and transformed them into symbols of imperial power or vassal submission.

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Thus, "demand" dictated "control." The "demand" was reflected in the requirement that vassal states adhere to fixed quotas; any "rare treasures or strange beasts" had to be reported to the court in advance for imperial adjudication. "Control" was exercised at the central level, where the Ministry of Rites (Li Bu) and the Court of State Ceremonial (Honglu Si) held core functions in tribute auditing and ritual management. Upon arriving in the capital, foreign envoys did not present tribute directly but underwent a two-tier screening: the Ministry of Rites verified whether the tribute complied with regulations and matched the initial declaration, while the Court of State Ceremonial assisted in verification from a ritual perspective to ensure "legitimacy" and "suitability." This screening process was not only a selection of qualified goods for the royal family but also an implicit preliminary inspection of unknown species. For flora and fauna with abnormal forms or obscure origins, the Ministry of Rites had the authority to reject them based on established codes, preventing unfamiliar species from directly entering imperial gardens or flowing into the interior. This central-centric auditing mechanism blocked the potential for harmful species to proliferate through tributary channels at the top-level design.

3.2. Decentralized Local Management

According to the Four Accounts of Maritime Nations, decentralized local management constructed multiple chains of prevention and control during the transport of tribute items. Foreign envoys entering the country had to strictly observe the personnel quotas and travel routes approved by the court. Along the route, the provision of rations, postal relay arrangements, and security were the full responsibility of the Governors-General and Governors (Dufu) of the regions through which they passed. As the highest local administrative officials, while fulfilling their logistical duties, these governors performed preliminary inspections of tribute items and accompanying goods. Although these inspections lacked explicit "ecological prevention" terminology, they practically involved checking packaging and luggage. If suspected pests (such as exotic insects or weed seeds) were discovered, they could be disposed of on the spot using local administrative power.

Furthermore, personnel detained at the border (liubian renyi) were "strictly guarded" by local officials, which mitigated social risks from unauthorized movement and prevented the private spread of alien species through these individuals. The involvement of the *Bing Bu* during the return phase created a "closed-loop" management system. When envoys departed after completing their business, the Ministry of War issued "tallies" (kanhe) and coordinated transport to ensure they exited along the prescribed routes, while indirectly supervising return luggage to prevent the unauthorized export or import of unvetted species. This division of labor—where local governors managed transit, central agencies managed auditing, and the Ministry of War managed the return—was born out of administrative efficiency considerations under ancient logistical constraints. However, it objectively achieved multi-layered inspections of tribute goods. The handovers and verifications across different departments and levels made it difficult for potential alien harmful species to evade multiple checks, significantly reducing the probability of ecological invasion.

3.3. Severe Punishments and Heavy Penalties

Although the "closed-door" policies (Biguanshuoguo) of the Ming and Qing were intended to maintain feudal rule and prevent external interference, they acted as a preventive measure against ecological risks. The core original intention of these policies was to safeguard the feudal order, manifesting as various restrictive policies on maritime trade, most severely the "Maritime Ban" , followed by the "single-port trade" system.[20] Initially, the Maritime Ban aimed to sever ties with anti-Qing forces and Japanese pirates; later, the policy shifted toward managing "intermingling between locals and foreigners" , imposing strict constraints on foreign

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merchants through systematic legislation, which objectively served an ecological risk-prevention function.

For those who privately crossed the border for hunting or went to sea for trade, the penalties ranged from flogging and exile to the death penalty, with harsh punishments also extended to those implicated by association . Compared to modern legal concepts, ancient criminal law prioritized the maintenance of imperial authority over human rights. Therefore, severe punishments served to terrify offenders and deter potential violators. Under the threat of such draconian laws, few dared to knowingly violate the prohibitions.

From the perspective of ecological protection law, "risk" refers specifically to the possibility of structural and functional damage to ecosystems and their components—a risk that is both objective and uncertain.[21]The closed-door policy indirectly reduced the possibility of cross-regional ecological disturbances by strictly limiting trade and personnel movement. This reduced the risk of exotic species entering via trade and disrupting local balances, and also mitigated pressures on coastal ecosystems caused by overfishing or resource exploitation driven by large-scale maritime trade. Furthermore, by "executing one to warn a hundred" through severe penalties, the system created a psychological deterrent, thereby circumventing the transmission and diffusion of cross-regional ecological risks to a certain extent.

4. Implications

Invasive alien species (IAS) have become a primary factor threatening China's natural ecosystems, ecosystem services, and human quality of life. They exert multiple negative impacts, such as directly causing species to become endangered or extinct and triggering the degradation of natural ecosystems.[1]Since the 1970s, the number of IAS worldwide has increased by nearly 70%; consequently, they have been classified as one of the five major drivers of global ecosystem degradation over the past half-century. In the two key areas of ecosystem protection and agricultural production in China, the threats and actual damage caused by alien species are particularly prominent. The List of Key Managed Invasive Alien Species released by China in 2023 includes 59 species, focusing on the groups currently causing the highest levels of damage and further clarifying the core species groups threatening China's ecological security and agricultural production. Accordingly, strengthening and improving the prevention and control systems for IAS has become an urgent and essential task.

4.1. Establishing and Refining Inter-departmental Collaborative Management through Centralized Coordination

China's current prevention and control system for alien species is structured around a division of responsibilities based on specific industries or sectors. This model has significant drawbacks: local governments often fail to fulfill their primary responsibilities, leading to management gaps. Furthermore, the lack of an authoritative and unified coordination mechanism results in overlapping functions between departments alongside regulatory "blind spots," making it difficult to form a systematic synergy. The invasion and spread of alien species are extensive and transcend industry boundaries, creating a contradiction with the current functional distribution model. Cross-industry invasions are common; for instance, the management of the red-eared slider requires simultaneous involvement from natural resources, agriculture, and market regulation departments, highlighting the limitations of current functional divisions. This necessitates a scientific definition of departmental powers and the improvement of collaborative mechanisms.

Moreover, there is a structural contradiction between the core functions of certain departments and their responsibilities in alien species control. Departments oriented toward industrial and economic development have a high demand for introducing and utilizing foreign biological

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resources, forcing them to balance economic growth against biosecurity. Control measures inevitably impose constraints on the introduction of species with potential invasive risks. When weighing these interests, such departments often prioritize economic development at the expense of rigorous control, leaving IAS prevention in a passive and marginalized state.[22]

Therefore, China should integrate the concept of centralized management to build a system suited to its national conditions. First, the central government should play a leading role in coordinating the overall landscape of IAS prevention, creating a comprehensive management system that integrates species control with ecological supervision. Territorial management should define local foundational responsibilities, while industry management focuses on specialized control in agriculture, forestry, and fisheries. Second, a dedicated agency for alien species management should be established to handle policy formulation, cross-regional coordination, and resource allocation. Third, local governments must prioritize the public interest, balancing regional economic development with ecological protection. The central government should also increase local fiscal budgets to incentivize the fulfillment of these functions. Finally, industry-specific responsibilities must be clarified: the fisheries department should regulate the aquaculture of aquatic alien species; the ecological environment department should conduct regular impact assessments; the agriculture and rural affairs department should strengthen screenings in farming areas; and the forestry and grassland department should focus on routine monitoring and early warning in forests, grasslands, and wetlands.

4.2. Ensuring the Independence of Risk Assessment through Decentralized Management

Article 3 of China's Administrative Provisions on Risk Analysis of Imported Animals and Animal Products (2018 Revision) stipulates that the General Administration of Customs unifiedly manages risk analysis. However, the separation of the risk assessment body from the risk management body is the core prerequisite for ensuring the scientific validity of assessment results.[23]The core standard for independence is whether the assessment body can operate autonomously from the administrative management body. While Chinese legislation has introduced the design of professional expert committees , practical limitations remain. The risk assessment body often remains dependent on the management body, whose policy preferences and administrative demands can implicitly influence the assessment process through resource allocation and task assignment, potentially causing the process to deviate from its scientific attributes.

To resolve this, the concept of "decentralized management" should be applied to grant risk assessment bodies an independent status through the following measures:Personnel Independence: Risk assessment committees should consist of professionals from universities and research institutes. A robust background investigation and recusal system should be implemented to ensure that members prioritize the public interest and maintain an objective stance.Structural Independence: The risk assessment committee should move away from administrative dependence. Drawing inspiration from the independent fiscal allocations and local autonomy enjoyed by provincial governors in ancient times, modern committees should have independent funding, dedicated staffing, and a legal status equivalent to administrative subjects, allowing them to conduct assessments in their own name within the scope of legal authorization. Functional Cooperation: Independence does not imply a total severance of ties. The management body and the assessment body should complement each other. The management body provides data and information support, while the assessment body provides the objective scientific basis necessary for orderly policy implementation.

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4.3. Strengthening Supervision and Increasing Penalties

In the era of the "15th Five-Year Plan," the diversification of spiritual and material needs has led to a surge in the "exotic pet" craze. These pets, often possessing unique appearances, pose significant risks if they are released or escape into the wild, as they can easily disrupt local ecological balances. According to the 2025 White Paper on China's Pet Industry, the market for exotic pets is approaching 10 billion yuan. This massive profit margin has incentivized the illegal importation of exotic species.

While exotic pet ownership has become a significant market segment, it requires rational guidance and regulation. Developed countries have established mature legal systems for cross-border biological supervision; for example, the UK mandates phytosanitary certificates for mail and imposes severe penalties for misreporting. In contrast, China's current regulatory framework for the transport of exotic pets through cross-border e-commerce faces legal loopholes and low costs of non-compliance.[23]

Therefore, China must update its legislation concerning cross-border e-commerce and animal or plant quarantine to build a normative system that is "preventable at the source and controllable in risk." Simultaneously, the government must crack down on illegal cross-border trade to strengthen the deterrent effect of the law. In the information age, social media should be utilized to enhance public awareness of ecological security. Furthermore, a joint government-public supervision system should be formed: the government must fulfill its primary responsibility by striking down wildlife crimes and regulating logistics/delivery services, while also encouraging the public to report illegal activities, thereby creating a robust defense for national ecological security.

5. Conclusion

In the context of the evolving global biosafety landscape, the invasion of alien species has emerged as a critical ecological security concern. Based on an analysis of ancient Chinese species management philosophies, this paper has identified existing challenges in China's current prevention and control framework and offered corresponding recommendations. Although the national administrative structure and the global context have been fundamentally transformed over time, the wisdom of the past remains highly relevant. As a civilization with a history spanning millennia, the historical experiences accumulated by China constitute an invaluable "think tank" for its contemporary efforts to combat biological invasions.

Looking ahead, China must continue to synthesize these historical lessons while addressing the practical realities of contemporary invasive species. By integrating these historical insights with advanced international legal and institutional models for invasive species control, China can achieve a rational transformation and application of these principles. Ultimately, this approach will facilitate the continuous refinement of China's institutional framework for the prevention and control of invasive species, thereby safeguarding national ecological security and biodiversity and fostering long-term socio-economic prosperity.

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