Original Research Article

On the Causes of the Decrease of Biodiversity and the Countermeasures

Xinqun Yuan,Yanfen Jiang,Zhihong Yan

School of Environment and Planning, Mudanjiang Forestry University, Heilongjiang, China

ABSTRACT

This paper summarizes the concept, meaning, meaning and current situation of biodiversity. The main reasons for the reduction of biodiversity are as follows: natural, man-made and institutional reasons, among which man-made causes include habitat loss, excessive exploitation of biological resources, environmental pollution and invasion of alien species. The establishment of a system of natural reserve laws, the establishment of alien species management and regulatory system; in the conservation of sustainable use of biological resources; to strengthen international cooperation and action, the establishment of a comprehensive system of protection, , In order to promote China's biodiversity conservation work.

KEYWORDS: biodiversity, cause, protection strategy

1. Overview of Biodiversity

1.1. The concept of biological diversity, meaning

Article 2 of the Convention on Biological Diversity, signed by States at the United Nations Conference on Environment and Development, held in June 1992, explains biological diversity as follows: all species of origin, including, inter alia, terrestrial, marine and other Aquatic ecosystem and its ecological complex.

In 1994, the 'Action Plan for the Conservation of Biodiversity of the People's Republic of China' formulated and promulgated by the Chinese government in 1994 made the following concepts on biodiversity: the so-called biodiversity is a complex of all the creatures, plants, animals and microorganisms on earth

However, the above-mentioned concept of biodiversity is lack of comprehensiveness, accuracy and conciseness, so this paper defines biodiversity as a complex that reflects all living things on earth and its habitats and included components.

Biodiversity includes three meanings, namely, genetic diversity, species diversity, and ecosystem diversity. There is a difference between the three and there are links. Genetic diversity refers to the variability of individuals within a species; species diversity refers to the diversity of living organisms on Earth; Ecosystem diversity refers to the diversity of habitats, ecological communities and ecological processes in the biosphere, and the ecosystem Differences in the diversity of ecological processes. Ecosystem diversity is the foundation, and species diversity is the key, and genetic diversity contains the greatest potential.

1.2. The significance of biodiversity

Biodiversity has a close relationship with the survival and development of mankind, and every level of biodiversity has important practical value and significance. The diversity of species provides a large number of wild and cultured plants, fish and animal products for humans. Genetic diversity plays an important role in cultivating new varieties and improving old varieties. For example, people can use some of the original population of crops, wild relatives breeding and local breeds to cultivate high quality, high quality and disease resistant crops. The most important role in ecosystems is to improve the resilience of the ecosystem and maintain the ecological balance. Therefore, biodiversity can not only provide human beings with abundant natural resources to meet the direct demand of human society for food, medicine, energy, industrial raw materials, tourism, entertainment, scientific research and education, but also to

maintain the function of ecosystem, , Maintaining soil fertility, purifying air and water, thereby supporting economic activities and other activities of human society. In addition, biodiversity directly affects China's cultural diversity.

1.3. Status of Biodiversity in China

China published in 1987, 'China's rare and endangered plant protection list,' the first phase, announced the endangered species of 121 species, 158 species of threat, rare 110 species, a total of 389 species, of which a class of protected plants 8, Class of 157 species, three kinds of 22 kinds. According to the Chinese Red Book estimates show that more than 1/10 that is more than 500 kinds of vertebrate species and 15% to 20% or 400 to 500 species of higher plants have been threatened. There is no definite statistics on the species and its quantity in China, especially for the investigation of endangered species. The problem is that some countries are not included in the list of endangered species facing the threat of survival, and some even endangered, while others because of artificial protection, breeding, use and make the number of population increase and decrease, it is necessary to adjust its Protection level or draw out, included in the protection of the column, in particular, is worth mentioning that medicinal plants and animals, such as yellow grass, urgent protection. In addition, wildlife trade has had a significant impact on China's biodiversity in recent years. As the demand for wildlife such as food, medicine and clothing is increasing, the illegal trade in wild animals and plants has also increased dramatically. The number of species of animal and plant species has been formed for several species of endangered plant and animal species and some of them not included in the national protection list Threaten. Such as: Tibetan antelope.

2. The main reason for the loss of biodiversity

The loss of biodiversity is both natural and naturally occurring, but for the time being, human activities (especially for nearly two centuries) are undoubtedly the main cause of loss of biodiversity. In addition, the system, especially the legal system is not perfect, it is another major cause of the loss.

2.1. Natural causes

First, the biological characteristics of the species itself. One is the formation and extinction of species is a natural process, fossil records show that the average life of most species of 100 to 10 million years. The second is the ability of the species to adapt to the environment or variability, adaptability is relatively poor, in the environment changes are difficult to adapt, and therefore facing the danger of extinction. Such as the giant panda, its endangered causes in addition to climate change and human activities, and its own food stenosis, low reproductive capacity of the body. Second, environmental changes (natural disasters), such as earthquakes, floods, fires, snowstorms, droughts and other natural disasters.

2.2. Man-made reasons

Because human beings do not know enough about the importance of biodiversity to human beings, but also pay too much attention to economic development, and have a weak awareness of biodiversity conservation, which leads to the occurrence of habitat destruction; excessive development of biological resources, and some even plunder The development of environmental pollution is serious; the problem of invasion of alien species is not enough and the system is not perfect, which are the main reasons leading to the decrease of biodiversity.

2.2.1 Loss of habitat, fragmentation, degradation

Habitat destruction and fragmentation have become the main reason for the reduction of some mammals in China, the narrowing of the distribution area and the endangered. Logging and land cover are two major causes of damage to habitats in China. Significant reductions in natural forests threaten the survival of mosses, lichens and higher species directly. In addition, logging is also a major cause of forest fires, and China has lost 8.6 million hectares of forest in the past 25 years due to forest fires. Grassland, wetlands and grasslands for agriculture and construction are another cause of habitat destruction. It is estimated that one-third of the current farmland in China is virgin forest, the problem is particularly serious in the Chinese tropics. In the past half century, about half of the coastal wetlands have changed, and wetlands around the plateau lakes have also suffered serious losses. In addition, 1950 to 1980, China's lake area decreased by 1/10. Habitat fragmentation refers to a large and continuous habitat is divided into two or more pieces of small pieces and gradually shrink the process. A variety of human activities can lead to fragmentation of habitat. Such as railways, highways, ditches, telephone networks, farmland and other potentially restrictive - separators of biological freedom, and man-made facilities such as roads built in nature reserves. In particular, because of the establishment of these facilities, the activities of animals are limited, thus affecting their foraging, migration and reproduction, and plant pollen and seed distribution will be affected. Resulting in a decline in the number of flora and fauna and cause local extinction. At the same time due to the fragmentation of the habitat, sunlight, temperature, humidity and wind changes,

will lead to some species endangered, or even extinction. In addition, the fragmentation of habitat contributes to the invasion of alien species, which threatens the survival of species. Habitat degradation is the loss of the original function of the habitat, such as due to economic development, excessive grazing and other reasons, making the grassland serious degradation, causing grassland biological physiological function decline, and thus a threat to its survival. Grassland degradation.

2.2.2 Predatory over-exploitation

Many biological resources have direct economic value to mankind. With the increase in population and the establishment and development of the global commercialization system, the demand for human beings has risen rapidly, resulting in over-exploitation of these resources and a decline in biodiversity. And when the commercial market for a wildlife resources have a greater demand, usually lead to the excessive development of the kind of biological. A typical example is the relationship between the human hunting activity of marine whales and the growth of whales. Many of our medicinal plants, such as ginseng, Tianma, Amomum villosum, Aesculus, yellow grass and Mangosteen, wild plants are already very limited, if still no restrictions will inevitably lead to extinction. Among them, poaching, indiscriminate smuggling of wildlife is the most serious threat to biological diversity.

2.2.3 Environmental pollution

2.2.3.1 Water pollution

Water pollution can cause sub-lethal or lethal effects on any stage of development of the life cycle of aquatic organisms (especially fish), affecting their predation, predation and reproduction. The effects of sub-lethal water pollution on water biological diversity are more prominent, common and long. In this environment the biological reproductive capacity is declining, growing slowly or dying from environmental stress-related diseases. The eutrophication of water can make the water biological diversity significantly decreased, Kunming Dianchi is one case.

2.2.3.2 Soil pollution

Soil pollution usually causes local vegetation to degenerate and even become barren, while soil animals become scarce or even extinct, and their biodiversity is significantly lower than that of uncontaminated areas. Such as mining areas, tailings accumulation of a mining area abandoned landfill and waste land are few trees grow.

2.2.3.3 Air pollution

Human beings to the atmosphere of the various toxic and hazardous substances can produce different degrees of loss of organisms, and constitute a hazard to the ecosystem. Through a variety of ways into the air of sulfur dioxide, ammonia, ozone can directly kill the biological. The toxic metals from the smelter's waste gas can directly poison the plant. And due to ozone depletion, acid rain and carbon dioxide and other greenhouse gases caused by the greenhouse effect caused by biodiversity damage, reduce the international community attention and attention, especially the greenhouse effect caused by global warming and acid rain on the biological diversity Impact.

2.2.4 Invasion of alien species

Invasive alien species pose a significant threat to biodiversity. There are three types of invasion: First, due to agriculture, forestry, animal husbandry and fishery production, urban parks and greening, landscaping, ornamental and other purposes of intentional introduction or improvement, such as flooding in Dianchi water hyacinth, genetically modified organisms; Activities introduced into the species, that is, unintentionally introduced, as a result of the ship pressure water, soil and other new species brought about; third by their own ability to spread or with the natural force and the introduction of natural invasion, such as in the southwest Zeeland, aircraft grass. About 35% to 46% of the global list of endangered species is caused by partial or complete invasion of alien species. In 2002 from the South American Amazon River piranha, also known as puffin pomfret in China set off an uproar. Once a certain amount of water reaches a certain level, it may kill a large number of other fish, to the ecological balance and bring a crisis of biodiversity, resulting in immeasurable losses.

2.3. Institutional reasons

Although my country has made some achievements in the conservation of biological diversity, biodiversity has suffered unnecessary losses because of the inadequacy of the system, especially the legal system. Mainly in: Although the state has put the effectiveness of environmental protection into the performance assessment, but some local governments did not really put this into the work plan; influencing the important sectors of biodiversity (such

as agriculture, forestry, fisheries and scientific research institutions), lack of relevant specific implementation details, actions and professionals. Nature reserves are an effective way to protect species and their habitats. My country has established a large number of protected areas, but it is not enough for the total area of land, and some protected areas are confused, and land ownership is unclear. The In the legal system, although the implementation of the 'nature reserve regulations' for many years, but after all, in the legal effect of the lower order, narrow adjustment, punishment is not enough, it is necessary to carry out new legislation to protect nature reserves, species and habitat The In addition, due to economic development; new towns, dams, reservoirs, and so on, there are some laws and regulations, such as 'import and export animal quarantine law' but no specific regulations to make corresponding adjustments, , The development and construction of mining areas; inadequate tourism activities and inadequate international cooperation will also pose a threat to biodiversity.

3. Protection measures

The protection of biological samples does not only need to speed up the management of environmental pollution, the protection of the work into the national economic development plan, more importantly, in the ecosystem level to take protective measures, the traditional approach is to establish a natural protection, by eliminating or reducing human interference Protecting ecologically fragile areas, in general, is an effective way to protect certain species or ecosystems. But there are many problems that need to be perfected, it is necessary to solve the legislation through the legislation, mainly on the nature reserve legislation. In view of the increasing impact of alien species on the biologicality of biodiversity, and our country has no special legislative protection measures, it is proposed to establish alien species management system. And with the continuous growth of population and land, passive protection has been difficult to really achieve the purpose of protection, for this sustainable use of biological resources. At the same time, biodiversity has a far-reaching significance for all mankind and requires the active participation of governments and people, with particular emphasis on international cooperation and strengthening of national education.

3.1. To establish and improve the nature reserve and the development of 'nature reserve legislation'

Nature reserves are areas that have a dual nature of protecting the natural environment and natural resources and are of a certain spatial extent. In our country refers to the representative of the natural ecosystem, cherish the endangered wildlife species of natural concentrated distribution area and the special significance of the natural relics and other protection of the location of the land and waters, according to the law to draw a certain area to be special protection and management Area. According to the 'World Resources' 1997 statistics, the world has established a larger area of protected areas more than 10,400, both in the possession of species, genetic, ecological diversity or in the protection of species habitat has played a very important But the countries also realized that due to the lack of legal protection of the law, the construction of nature reserves, the management of chaos, the development and protection of protected areas prominent contradictions, chaos, indiscriminate poaching behavior constantly, resulting in some natural reserves destroyed serious.

As a result, many countries have specialized legislation on nature reserves and national parks. For example, the National Parks and Native Land Law of the United Kingdom, the Natural Parks Act of Australia, the National Parks and Wildlife Conservation Act of Australia, the National Parks Act of Canada, the Natural Parks Law of Korea, and so on. In addition, a number of countries have developed comprehensive laws on nature reserves or biodiversity conservation and have incorporated nature reserves. For example, Japan's 'Nature Conservation Act', New Zealand's 'Nature Conservation Act', South Korea's 'Natural Environment Protection Law' and so on. These laws have been very effective in protecting biodiversity.

Therefore, whether it is according to international practice or from our national conditions, it is necessary to pay close attention to the development of a 'nature reserve law', due to the protection of nature reserves, construction, management, development and utilization of social relations arising from and Adjustment. It is proposed to revise and improve the relevant legal systems, such as classification protection and management system, supervision and management system, investment safety system, reference system, and so on, on the basis of the existing laws and regulations: legal system such as examination and approval system, graded zoning system, management system and inspection and emergency system Foreign advanced experience, the creation of new legal systems, such as functional zoning system and social impact assessment system.

3.2. Prevention of alien species and establishment of alien species management regulations system

Invasion of alien species poses a threat not only to local creatures, but also to immeasurable losses to the economy and human health, and some countries have enacted legislation. Such as the United States has promulgated or systematically revised the 'Wild Animal Protection Law', 'Alien Species Prevention and Enforcement Act', 'National

Invasion of Biological Law', 'Alien Pest Prevention and Control Law', 'Federal Hazardous Weeds Law' New Zealand 'Biosecurity Law' and so on.

There are a number of laws and regulations in China that involve the management of alien species, such as the introduction of aquatic and terrestrial wildlife approval systems under the Wildlife Conservation Act (1988), the Agriculture and Forestry Bureau; the Wild Plant Protection Ordinance (1996) Entry and Exit Animal and Plant Quarantine Law ',' Animal Epidemic Prevention Law 'and' Phytosanitary Regulations '. However, there are no specific regulations for the invasion of alien species. The China Biodiversity Conservation Action Plan deals with invasive alien species but has not developed a plan of action specifically targeting alien species invasions, so China urgently needs to enact laws and regulations to ensure ecological security and protect its own biodiversity. Such as the establishment of the introduction of the licensing system and environmental impact assessment system, the establishment of alien species invasion and early warning mechanism. In addition, it is also necessary to conduct a census and planned removal of alien species.

3.3. Sustainable use of biological resources in conservation

Although the world has established a number of nature reserves, national parks and other forms of protection methods, but relative to the Earth's biosphere, the protection of biological diversity is limited. It is therefore recognized that effective and long-term credible methods of conserving biodiversity are the continued use of biological resources. Refers to the use of biological resources in order to enable biodiversity to be protected, regenerated and developed at all levels. In the case of protection, there is no protection without reasonable use. The use of nature conservation and the development of tourism is one example. Not only the economic benefits, in fact, is to promote the masses, educate the masses, so as to obtain the broad masses of the broad support. Which in itself is the embodiment of social benefits, but also the value of the nature of conservation. It is also recommended that important biodiversity (eg agriculture, forestry, fisheries, scientific research institutions), which have an impact on biodiversity, develop biodiversity conservation plans and incorporate them into their production plans to encourage diversification of biological resource use. Including the implementation of traditional agricultural and forestry measures based on the actual situation of local resources; the promotion of scientific research and education; and the necessary means to protect protected areas from human activities and ex situ conservation.

3.4. Country cooperation and action

On the issue of biodiversity, the consensus among the world is that biodiversity issues are not local, regional, but global. The relevant organizations of the United Nations, the world scientific community and national government departments believe that international cooperation is an important aspect of promoting biodiversity conservation. Therefore, my Government should actively participate in international cooperation to join the agreement, jointly combat cross-border illegal trade and hunting. Strengthen scientific research cooperation, but pay attention to sovereignty and property rights.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, the International Whaling Convention, the Convention on Biological Diversity, the Tropical Timber Agreement, the Convention on Wetlands for the Protection of Special Waterfowl, and so on, In order to better protect our biological diversity, we should actively carry out international cooperation and formulate relevant implementation plans and rules, and, if necessary, formulate relevant administrative regulations or laws.

3.5. To strengthen environmental education

From the overall and local view, the quality of the national quality is directly related to the ecological environment and biodiversity is good or bad, a lot of information shows that those who are less environmentally friendly education in countries and regions, usually the higher the frequency of ecological damage, the deeper , The more the problem. In addition to the development of biodiversity, this should strengthen the public education, extensive, popular and perseverance to carry out environmental-related cultural education, legal propaganda and nurture localized pro-Ecological population. Particularly worthy of attention and advocacy is the use of local culture, customs, traditions, beliefs, religion and habits of environmental awareness and ideas, such as ethnic areas of Longshan, Fung water, publicity and education. It is also recommended that extracurricular activities should be carried out in primary and secondary schools or in environmental education in nature, chemistry, biology and geography.

In addition, to speed up the national biodiversity check; according to the actual situation to change the level of animal and plant protection; restoration of damaged ecosystems; and some key rare and endangered species artificial breeding and expansion of the work is also necessary. In short, the demise of a species is often not the result of a single factor, but the result of multiple factors combined. Therefore, the conservation of biodiversity is a comprehensive project that requires all aspects of participation, not only the government, but also the people; not only need a single

discipline, but also need more disciplines; not only a country or region, but the global Of the common participation and cooperation.

4. Biodiversity and its value

Biodiversity is the sum of the ecology and its ecological complexes associated with the environment and the various ecological processes associated with it, including millions of animals, plants, microbes and the genes they possess and their interactions with their living environment Of the complex ecosystem, is the basic characteristics of the life system. The life system is a hierarchical system that includes multiple levels or levels: genes, cells, tissues, organs, populations, species, communities, ecosystems, landscapes. Each level has a rich change, that is, there are diversity. However, it is important in theory and practice to study more genetic diversity (or genetic diversity), species diversity, ecosystem diversity and landscape diversity. Nowadays, biodiversity is often seen as a living entity itself, not just as an important feature of the life system. The diversity of human culture can also be considered as part of the biodiversity. Just as genetic diversity and species diversity, some of the characteristics of human culture (such as nomadic and mobile farming) show the strategies that people live in a particular environment. At the same time, cultural diversity, like other aspects of biodiversity, helps people adapt to changing external conditions. Cultural diversity is manifested in the diversity of language, religious beliefs, land management practices, art, music, social structures, crop selection, diets and numerous other human social characteristics.

Biodiversity is the material basis for human survival, and its value can be understood from the following two aspects. First, direct value. From the wild and domesticated components of biodiversity, humans have obtained all the food, many drugs and industrial raw materials they need, and at the same time it plays an important role in recreation and tourism; secondly, indirect value. Indirect values are primarily related to the functioning of the ecosystem, which is usually not manifested in the national accounting system, but if calculated, its value is much greater than its direct value of consumption and productivity. The indirect value of biodiversity is mainly manifested in seven aspects: fixed solar energy, regulation of hydrological processes, prevention of soil erosion, regulation of climate, absorption and decomposition of pollutants, storage of nutrients and promotion of nutrient cycling and maintenance of evolution. Over time, the greatest value of biodiversity may lie in providing human beings with opportunities to adapt to local and global changes. The unknown potential of biodiversity presents an immeasurable good prospect for human survival and development.

5. Biodiversity threats

In recent years, the intensification of species extinction, the reduction of genetic diversity, and the large-scale destruction of ecosystems, especially tropical forests, have aroused great concern to the international community on biodiversity issues. The main causes of biodiversity loss are habitat loss and fragmentation, invasive alien species, overproduction of biological resources, environmental pollution, global climate change and industrialization of agriculture and forestry. But these are not the root of the problem, the root causes of the dramatic increase in population and the high speed of natural resource consumption, the ever-narrow trade spectrum of agriculture, forestry and fisheries, the economic system and policies fail to assess the value of the environment and its resources. The uneven distribution of benefits arising from the use and protection of resources, the inadequacy of knowledge and its application, and the irrationality of the law and institutions. All in all, human activity is the underlying cause of the loss of biodiversity at an unprecedented rate.

China is one of the countries with particularly rich biodiversity. According to statistics, China's biodiversity ranks eighth in the world, the first in the northern hemisphere. At the same time, China is one of the countries with the most serious threats to biodiversity. China's virgin forest has long been affected by deforestation, deforestation and other man-made activities, the area of 0.5 × 104km2 per year to reduce the rate; grassland due to overloading pasture, destruction of grassland, the degradation area of 87 × 104km2. The destruction and degradation of the ecosystem is not only manifested in the reduction of the total area, but more seriously its structure and function of the reduction or loss of many of these species have become endangered species or threatened species. 4000-5000 of the higher plants are threatened, accounting for 15% to 20% of the total species. Of the 640 world endangered species listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), China accounted for 156, about 1/4 of its total, and the situation was very severe.

Biodiversity conservation is related to the survival and development of China. China is the world's most populous country with a low per capita resource, and is about 85% of the country's agricultural population in rural areas, with a strong dependence on biodiversity. China is one of the countries with the fastest economic growth in recent years and has exacerbated the pressure on the environment, especially biodiversity, to a large extent. If we do not take effective measures to curb the deterioration of this situation, China's sustainable development is impossible to achieve, and even threaten the world's development and security.

6. Important actions for biodiversity conservation

In view of the grim situation of biodiversity, relevant international organizations or agencies, as well as many Governments, have taken steps to work on the conservation and sustainable use of biological diversity. The United Nations Environment Program (UNEP) proposed objectives, strategies and implementation programs for the conservation of biological diversity in the United Nations System-wide Medium Term Environment Program, 1995-1995, drafted in 1987-1988. The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, Brazil, in June 1992, adopted the 1994-2003 Decree on the International Decade for Biological Diversity. At the same time, the Convention on Biological Diversity (hereinafter referred to as the Convention) was adopted, at which time 150 heads of State signed the Convention. The purpose of the Convention is to protect biodiversity, the sustainable use of biological diversity and the equitable sharing of benefits arising from the utilization of genetic resources. The Convention mainly covers four aspects: national sovereignty and human common concern, protection and sustainable use, access to issues and funding mechanisms. The Convention is a framework document that emphasizes national-level action and leaves room for the States parties to implement the Convention. In order to commemorate the entry into force of the Convention and to better publicize and implement the Convention, the United Nations General Assembly adopted resolution 49/119 of 29 December 1994 and decided that, from 1995 onwards, on 29 December of each year, the International Biodiversity Day '. The United Nations Environment Program (UNEP) convened four States parties in Nassau, the capital of the Bahamas, Jakarta, capital of Indonesia, Buenos Aires, Argentina, and Bratislava, the capital of Slovakia, in 1994, 1995, The General Assembly has played an important role in promoting the implementation of the Convention. In order to ensure the scientific and effective implementation of the Convention, the Scientific, Technical and Technological Subsidiary Body (SBSTTA) has also been established. China actively participated in the global biodiversity conservation action. In 1992, Premier Li Peng attended the United Nations Conference on Environment and Development held in Brazil on behalf of the Chinese government and signed the Convention. Subsequently, the Chinese government has ratified the Convention and fulfilled its obligations. Under the State Council Environmental Committee, the State has set up a working group to implement the Convention and coordinate the implementation of our country. Respectively, in 1994 and 1997 to complete the 'China Biodiversity Conservation Action Plan' and 'China's Biodiversity Report', and officially released. At the same time, to strengthen the protection of species and nature conservation laws and regulations, and successively launched the natural forest protection projects and other biodiversity conservation projects. Which laid a good foundation for the protection of biodiversity in China. The government's determination and measures are very important. But the government's efforts are not enough, we must mobilize the people of the whole country, work together to protect China's biological diversity, to achieve sustainable socio-economic development.

References:

1. Wang Xi. International Environmental Law. Law Press 1998
2. Han Depei, editor. Environmental protection law. Tutorial Law Press 1998
3. Cao Zhiping. Ecological Environment Sustainable Management. China Environmental Science Press
4. Mao Wenyong, Liu Jianping. Global Environmental Problems and Countermeasures. China Science and Technology Press
5. Ivan B. Resources Environment and Sustainable Development. Ocean Press
6. Xiong Zhiyan. Environmental Biology. Wuhan University Press
7. Chinese alien species blacklist. Science Life 2004 (3)
8. China Human Development Report 2002. China Finance and Economics Press 2004.3
9. Wang Fengnian. The reasons for the reduction of biodiversity. Tsinghua University 2004 (3)