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Research Article

Ecological Environment Status and Protection Measures of Wetland Nature Reserve

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Abstract: In order to better promote the restoration and sustainable development of the natural ecological environment, it is necessary to study the wetland system as an important part of the ecosystem, put forward some common problems faced by wetland nature reserves, and propose relevant solutions based on the problems. This paper describes the relevant theoretical basis for the ecological environment protection of the wetland nature reserves, the problems faced, and the relevant solutions as reference for relevant personnel.

Keywords: Wetland nature reserve; Ecological environment; Protection measures

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Wetland is a wet or shallow water area on the ground surface, which is a geographical complex of wet and aquatic organisms and hydrated soil, including rivers, lakes, swamps, and 6m-deep sea areas under low tide. Wetland is a unique natural complex and water-land composite ecosystem on the earth. It is the most biologically diverse ecological landscape in nature and one of the most important living environments for human beings, being honored as the "kidney of the earth". Together with forests and oceans, it is listed as one of the three major ecosystems in the world. For a long time, its value has not been known to people. Wetland is closely related to the survival, reproduction and development of human. It is the most biologically diverse ecological landscape in nature and one of the most important living environments for human beings. It not only provides a variety of resources for human production and life, but also has great environmental functions and benefits, providing water sources; supplementing groundwater; regulating water flow, controlling floods, preventing natural disasters; protecting embankments and windproofing; removing and transforming poisons and impurities; retaining nutrients; preventing salt water intrusion; providing usable resources, regulating regional climate, maintaining biodiversity, controlling the carbon cycle, shipping, tourism and leisure, education and scientific research etc., which is of great strategic significance.

Most of the existing wetlands are strongly disturbed by humans, the ecological health of the wetlands has deteriorated, and the functions of the wetlands have been seriously degraded. Due to reclamation of lakes, land reclamation from the sea, and reclamation of tidal flats, natural wetlands have been declining. Many wetland species, landscapes, and ecological functions are gradually disappearing. It is manifested as the decline of wetland water retention, storage capacity and flood retention capacity, and the risk of flooding is increased; the decomposition and pollution capacity is reduced, and the water quality-type water shortage becomes more serious; the ecosystem structure changes, and the productivity is reduced; the ability to regulate climate and embankment protection is reduced; and the aesthetic value of natural landscape is destroyed. In many wetlands and surrounding areas, the deterioration of the ecological

environment, such as vegetation degradation, salinization, soil erosion, and the increase in the number of droughts, indicates that the ecological functions of wetlands are damaged, and the ability to resist natural disasters and ecological restoration is lost.

1 Theoretical Basis for Ecological Environment Protection

1.1 Ecological Restoration

According to ecological principles, the main factors or processes of ecosystem destruction are artificially altered and prevented through specific biological ecological methods and engineering technologies, and the processes and spatial levels of material, energy and information flow inside and outside the system are adjusted and optimized. The structure, function and ecological potential of the wetland nature reserve should be based on the concept of ecological restoration, and the development of the ecological culture of the wetland should be based on the ecological planning and design of the wetland nature reserve to achieve the sustainable development of the ecosystem. When restoring wetland ecosystems, attention should be given to restoring the structure and functions of wetland ecosystems, restoring plant communities, establishing animal habitats, restoring hydrological cycles, improving water quality and soil, and maintaining the historical background and geography of wetlands.

1.2 Ecological Landscape

The landscape ecological map of the ecological planning and design of the wetland nature reserve mainly includes three aspects: landscape ecological restoration, landscape ecological protection, and landscape ecological construction.

1.2.1 Landscape Ecological Restoration

Wetlands face serious ecological problems, including vegetation destruction, land function degradation, river shaking, sedimentation, and loss of biodiversity due to urban development issues. In the wetland ecological planning and design, we analyzed the causes of damages to the ecosystem based on the ecological restoration theory, fully integrated other factors according to the stability requirements of the ecosystem, and used natural and artificial methods to restore the wetland environment.

1.2.2 Landscape Ecological Protection

The ecological planning of the wetland is based on the characteristics of local plants, soil, aquatic system, animals, site culture, geographical features, etc. (depending on local conditions) and as many primitive ecosystems as possible to protect the original ecological environment of the wetland so as not to destroy it. The original resources of animals and plants, water bodies, tidal flats, breeding and other resources protect the ecological environment.

1.2.3 Landscape Ecological Construction

Landscape ecological construction enhances the stability and heterogeneity of the landscape through structural adjustment and construction of landscape units, enhances the function and efficiency of the landscape ecosystem, and creates a new ecological, social and economic system that is superior to the original landscape ecosystem. The favorable landscape pattern forms a harmonious and efficient artificial and natural landscape. In the planning and design of the wetland, we are provided an opportunity to get close to nature through landscape improvement and ecological resource optimization based on the original landscape elements, while protecting the environment.

1.3 The Theory of Environmental Capacity

Environmental capacity, also called environmental endurance, is a relatively basic theory for wetland protection and development. According to the characteristics of the ecological environment, reasonably calculate the environmental capacity to regulate and control the flow of people, so that tourism activities are controlled within the capacity range. Ecological carrying capacity is to limit tourist activities or tourism to the maximum range of human activities that the natural environment can bear. Wetlands are facing crises such as destruction of the ecological environment, ecological imbalance, occupation by construction sites, decline of ecological functions, and invasion of agricultural and forestry lands.

The ecological system of the wetland nature reserve is fragile, and its ecological carrying capacity limits tourist activities or tourism to the maximum range of human activities that the natural environment can perform. Therefore, it is reasonable to calculate the environmental carrying capacity is according

to the characteristics of the ecological environment in the planning process. Adjust and control tourist activities within each carrying capacity. Therefore, from the perspective of the meaning of environmental capacity, the density and intensity of landscape construction, the flow of people in the wetland is strictly controlled in planning and design, and the human control based on environmental capacity can minimize the impacts on the wetland ecology and landscape.

2 Problems Facing the Ecological Environment in Wetland Nature Reserves

2.1 Weak Awareness of Legal Protection and Weak Infrastructure in Wetland Reserves

Since the establishment of many wetland reserves, the lack of facilities such as demarcation signs and billboards has led to frequent fishing and sand digging in the reserve, causing serious damage to the protected species in the area. Although municipal authorities provide financial support for the construction of wetland reserves, most of the reserves have weak foundations, weak protection and management. Infrastructure is still scarce, office conditions are poor, and equipment is scarce. In the long run, it is difficult for much management, scientific research and public relations work to persist. Improving and renewing the infrastructure and equipment of the wetland reserve as soon as possible is the top priority for the further construction of the wetland reserve.

2.2 Need to Strengthen Scientific Research and Monitoring Capabilities

Due to weak scientific and technical skills, certain necessary scientific research and monitoring could not be carried out. Introduce senior experts, equip with scientific research equipment, and strengthen cooperation with surrounding, provincial and national scientific research and education units. Through introduction, dispatch and other methods to conduct business and technical training, comprehensively improve the professional level and professional quality of all kinds of personnel in the wetland reserve.

2.3 Publicity and Educational Functions have not been Fully Utilized

The awareness of promoting ecological protection is not strong, and the efforts to promote education and publicity are lacking. The ecological promotion of most wetland reserves is not highly integrated with the local tourism industry, and development opportunities are missed. Therefore, the promotion and education of wetland reserves are still at a basic level. The popularity of wetland reserves is inconsistent with its ecological conditions.

2.4 Management

Since most wetland reserves are extensive and have many departments, their management capabilities are still limited, labor is scarce, labor quality is low, daily operating funds are insufficient, administrative management is low, negotiation skills are limited, and law enforcement capabilities are weak.

2.5 Pollution Control

With the economic development of river basin, the intensity of sewage discharge from human daily life and production water has increased, leading to increased eutrophication of water bodies. For wetland reserves, reducing the nutrient content or nutrient accumulation in water bodies is a permanent measure. Special concern should be given to wetland protection areas without eutrophication of water bodies, and corresponding measures should be taken.

3 Measures for Wetland Protection

3.1 Raise Civic Awareness and Corporate Standardization

Regarding wetland protection measures, first of all, it is necessary to enhance personal awareness, increase awareness of wetland protection and environmental protection, rational use of water resources in daily life, and classification of domestic waste. Meanwhile, the government should strengthen relevant public relations, open up various channels, promote the protection of the wetland environment, and increase residents' awareness of wetland protection. Enterprises should adopt relevant measures to protect wetlands, pay attention to the reasonable discharge of industrial wastewater and industrial waste, and ensure that the policy requirements can achieve long-term results. The state has promulgated relevant laws and regulations, imposing certain fines on companies and individuals who do not consciously protect the environment, so that everyone realizes the importance of the state in environmental protection.

Strengthen supervision and management of wetland protection activities. It provides specific rewards for individual units or company factories that protect wetlands, so that more people can imitate wetlands and protect the environment in reality. Other relevant departments need to conduct inspections on wetlands to better protect the environment, such as regular comprehensive inspections of the water quality and ecological diversity of specific areas or surrounding soils to determine the degree of pollution of the wetlands.

3.2 Establish and Improve Relevant Protection Mechanisms

Conservation and management are key tasks in protecting wetland nature reserves. It focuses on management, improving the legal system for protecting the environment, formulating plans for related documents and further implementing them. In addition, relevant personnel from the fire departments should also be trained so that the natural protection measures for wetland protection can be fully implemented. When a relevant emergency occurs, the relevant departments must have a certain emergency response capability. Adjust the focus of work according to the seasons, take working intensity and effectiveness as the assessment criteria and link directly to wages, raise the enthusiasm of relevant protection personnel, adjust daily life behaviors, and improve mobility.

3.3 Establish and Improve Relevant Scientific Research Mechanisms

In the process of wetland protection, the work on the scientific research supervision mechanism should be strengthened to make wetland protection work more standardized and carried out accurately. Meanwhile, it can cooperate with relevant scientific research institutions at home and abroad to establish friendly relations with agricultural and forestry universities. Establish relevant ecological sites, investigate the ecological environment of the area, investigate the fish and bird ecosystems in the wetland environment of a specific area, understand the balance between the local wetland environment and the ecosystem, and report to the national or regional ecological protection agency. Through the establishment and improvement of related protection measures and protection networks, a system can be formed in the protection process and a complete protection network can be established in the network. Employees can conduct relevant ecological environmental protection research and discussions to find more accurate methods. Through the development of local tourism and economy, more people will hope to learn about and visit the natural environment of wetlands, learn about nature, protect nature and protect the natural environment of wetlands. The education of elementary and middle school students should also promote the popularization of relevant laws and regulations, and carry out relevant education and public relations activities regularly to protect the ecological environment, so that students develop a sense of protection from childhood. This will not only calm down the usual busy study routine, but also increase the workload.

3.4 Water Protection

Water bodies are an important part of wetland ecological protection. By strengthening the water system connection both inside and outside the protected area, not only can the water quality be protected and improved, but also sufficient and reliable water resources can be provided for the wetlands, and the virtuous cycle of the urban water system with independent purification capabilities can be promoted. By strengthening the connectivity of various water systems in the protected area, not only can the living space and activity space of organisms be expanded, but also the biodiversity can be enriched, the connection between surface water and groundwater can be strengthened, and ecological technology can be improved. It can be used to treat sewage and control pollutants.

3.5 Protection of Biodiversity

It combines the types, species, distribution characteristics and conditions of the existing ecological environment, simulating the pattern of natural and nutritional systems, and rationally constructing wetland plant communities according to the current conditions of each region to create a suitable habitat. Use ecological filtering devices, dams, grass slopes in the water, use aquatic plants to purify and ecological islands to improve water quality, design ecological slope protection, coastal wetland islands, marine ecological islands, purify water bodies and monitor water quality attentively to attract more biological habitats. The best use and selection of native animals and plants, scientific

introduction and cultivation of appropriate exotic animals and plants to increase the diversity of animals and plants, strengthen ecological regulations, strictly prohibit fishing, reclamation and planting activities, and protect and restore wetland biodiversity. Through the isolation of traffic, the establishment of ecological barriers, scientific guidance and management, tourists are controlled to reduce the interference of the flow of people to the environment.

3.6 Cultural Protection

The river is the birthplace of culture and has produced unique folk cultures. We must protect and preserve the traditional production methods and customs with local characteristics such as historical buildings, folk culture and folk art. Wetlands have a long history, splendid culture and splendid art. They are the source of this cultural landscape. These tangible and intangible heritages will be better inherited and developed, and the wetlands will be effectively protected.

4 Conclusions

Wetland protection is not only related to maintaining ecological diversity, but also regarding the long-term development of mankind. Environmental protection is urgent, because the natural environment is the home for humans and other species to survive. Reasonable protection of wetlands can bring convenience to human life. For example, wetlands can replenish groundwater and save water sources to ensure the availability of large water reserves for farmland irrigation or industrial and domestic water. Meanwhile, wetlands play a positive role in improving the surrounding environment, regulating groundwater and promoting water balance.

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