Spatial Appeal and Spatial Response of Hui-xian Wetland Protection and Development in Guilin—Based on the Natural Landscape

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Abstract. Hui-xian wetland is the largest karst wetland in China, which has unique natural landscape resources. This paper is based on the natural landscape, historical evolution, ecological protection, landscape aesthetic perspective, the analysis result of the spatial demands of Hui-xian wetland recovery is in the range of 39.2km², the specific demands include: 1) waters repair development; 2) linear space series; 3) landscape space integration. From the aspects of land conversion, corridor construction, layout adjustment and other aspects, this paper puts forward the way of spatial response, and finally comes to the conclusion that the wetland can be restored to 25km². This study can provide some theoretical reference for the rational development and utilization of wetland and the scientific planning of wetland protection.

Introduction

Hui-xian wetland in Lijiang River Valley, is a representative karst wetland peak forest plain areas in the world, its grand scale, unique natural landscape, in the country and the world are extremely rare. With the Guilin international tourist resort construction fiery, protection and development of the Hui-xian wetland was imminent, but the spatial scope of wetland ecological restoration sure, but there is no convincing results and theoretical support. Therefore, from the space demand and spatial response perspective, will study the protection and utilization of Xian wetland has strong time urgency and necessity of the theory. At present the research achievements about the wetland more, Li-yan Ren (2009) the comprehensive use of land science, landscape ecology, geography, statistics, ecological economics theory and method, analysis of the wetland landscape evolution of the driving force and main driving factors; Min-xia Liu (2009) by using the principle of ecology, protection and exploitation of wetland area pattern of Dun-huang Nature Reserve, but above research angels are mostly from ecology, hydrology geology, research on wetland management from the perspective of social space, perspective on the study of wetland protection and utilization of wetland restoration area is less, it is lack of systematic analysis.

The Characteristic Analysis of Hui-xian Wetland Landscape Resources Present Situation

Based on the analysis of the status quo of Hui-xian wetland types of land use, the land use status of many types, among them, arable land, ponds total land area up to 50%. Of Hui-xian wetland status of the waters of the total area of about 12km², in terms of spatial distribution, mainly concentrated in the large area of water wet core zone, namely nine head mountain lion. Mountain, Lantau Peak, between da-chang mountain and ancient Gui-liu canal, its use in aquaculture ponds, such as Du Tong, Dragon Lake. Other water spatial distribution is more fragmented, including Mu-dong lake, Qin Tang and so on.

In the wetland natural landscape resources, Hui-xian wetland is a typical karst wetland scenery in the world, "karst mountain", "water", "canal", "Dong Jing" as a whole, the remarkable characteristics of spatial distribution is obvious. Among them, the landscape resources in the mountain landscape is mainly distributed in the northeast wetland in the region, the pinnacle of
buildings, different shapes, showing a unique peak cluster depressions and peak to valley landscape; water scenery of the landscape resources are mainly concentrated in the Mu Dong Lake area, including the ancient Guiliu canal, Mu Dong River, pond water, the Feng Jia Tang, the surrounding farmland, streams, ponds and reservoirs clouds, blend with each other, the ancient Guiliu canal, a "Jiangnan" means; internal wetland paddy area is large, widely distributed, farming style full, forming a unique pastoral scenery in karst area; wetland plant landscape resources more types, including There are 316 species of vascular plants; 166 species of birds, mainly inhabit the core area of wetland; reeds and other aquatic plants are mainly distributed in the vicinity of the ancient Gui-liu canal.

Figure 1. Current Situation of Land Use in the Wetland.

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Study on Wetland Restoration

The Historical Evolution Angle. The Song Dynasty, Hui-xian wetland area of about 65km², is bounded on the west by the river and east of Acacia, Liang Feng Jiang connected to the north to the south of the Yan-shan. It has good ecological environment and beautiful natural scenery.

1950s, the wetland area has been reduced to 25km², the remaining lakes are more than 20, the region is still within the scope of the fork vertical and horizontal, reed clusters, vegetation, is the city of Guilin was quite famous scenic tourist area

Nearly half a century, reclaimed wasteland made Tang and other acts, the status of wetland has shrunk to 12km², and the water space is fragmentary.

Through the above analysis, Hui-xian wetland scale has been greatly reduced. From the situation of land using artificial wetland area type, wetland is transformed into arable land, bare land, farmland or Grassland Nature Reserve.

The author uses the topographic map and other related information has been obtained by using ArcGis software, image processing and spatial analysis, simulated wetland area terrain elevation, the history of geographical Xian wetland restoration feasibility analysis, and by collecting relevant historical documents, pictures, video and other data, and field surveys and interviews, in-depth understanding of the historical characteristics Hui-xian wetland, the final delineation of Hui-xian wetland restoration requirements range, namely 28.7km².

The Ecological Perspective. Hui-xian wetland is known as the" Guilin "kidney. Because of natural factors and artificial factors in Hui-xian wetland fragmentation degree is higher than the ecological isolation serious. At the same time, wetland wildlife resources have been reduced, reducing biodiversity, water resistance, water purification and ecological function. Therefore, the
urgent need for the repair or reconstruction of the degeneration and loss of wetlands, the structure and function of wetland ecosystem can recover to normal level, and ultimately achieve" self-sustained Guilin "the kidney of the state.

Starting from the perspective of ecological protection, we need to break the fragmentation of wetland, connect the water space to ensure the exchange of material, information, energy; secondly, the full restoration of the status of core area, set aside a clear ecological corridor and adequate habitat, animals provide good conditions for the recovery of plant communities and migratory wetland birds; finally, restore the dry land, grassland, land area of bare land. For example, between the nine head of Lantau Peak mountain and dry land, vast grassland da-chang mountain, terrain are low-lying, often flooded, consider transforming it into the water.

According to the above requirements, the restoration of the wetland will be finalized, and ultimately determine the total area of wetland restoration is $27.8\, \text{km}^2$.

**Landscape Aesthetics.** As Karst landforms in the natural lake wetland, the aesthetic value is high. Its "beauty" is mainly manifested in the "open" and "beautiful picture of wetland landscape vegetation" as a whole natural conception. And road Xian wetland, a lot of farmland, artificial canals, residential land point by disorderly, undermining the integrity of the original wetland landscape and landscape space sequence, making the original landscape spatial pattern becomes blurred, the connection between the landscape decreased, landscape features appear insufficient, natural aesthetic value decreased. Therefore, to discuss on the recovery of wetland landscape space from the aesthetic point of view, to promote interaction and the natural wetland landscape in space, create a wetland landscape conforms to the natural aesthetics.

Hui-xian wetland core area is representative of the native landscape, it has need to be repaired comprehensively; secondly, recovery of the small patches of land near the mountain, which is communicated with the water in the vicinity of the lake, expand the space; Finally, it is better on the existing landscape location, the high quality of the garden, woodland. Preservation and repair.

In summary, the wetland restoration space range is $34.5\, \text{km}^2$.

**Analysis of Wetland Restoration Scope**

Through the above from the historical evolution, analysis the feasibility of range three aspects of ecological protection and restoration of wetland landscape aesthetics, and that their recovery, on this basis, this study stacks with spaces for three wetlands, wetland in determining meet its historical development, ecology, aesthetics and other aspects of the basic requirements come on, from a theoretical point of view, the scope of wetland should be restored to $39.2\, \text{km}^2$.

![Figure 2. The range map of the wetland.](image)
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Water Repairing and Expanding Area. The area of water in wetland is shrinking, it brought about the adverse effects, one is to lose the original wetland landscape, ornamental water supply decreased; two is wetland vegetation reduction, decrease the aquatic environment quality, effects of wetland biodiversity conservation; three is the low wetland water storage capacity and drought. Therefore, the water area needs to be expanded.

Linear Space Construction. Fracture space waters fragmentation and landscape resources, not only reduces the ecological succession of wetland, the wetland landscape spatial continuity, hierarchy and rhythm damage. Therefore, it needs to establish a linear ecological network as a whole so that it can break the scattered patches, forming an organic whole.

Landscape Pattern to Strengthen the Appeal. Hui-xian wetland is the natural beauty of nature, the natural landscape spatial integration is high, Hui-xian wetland needs to strengthen the interaction relationship in space, promote the overall natural landscape of wetland landscape integration, strength then the overall spatial pattern.

Spatial Response of Hui-xian Wetland Protection and Development

Spatial Response Result

The trend of the wetland protection and development and landscape of wetland, scale, ecological and other aspects of the specific requirements has been analyzed, and according to the actual use of Hui-xian wetland, the demand of social economic development, the feasibility of ecological restoration, factors and policy guidance, put forward the above principles. To sum up, in response to the demands of space Xian wetland restoration area, get the response results, namely 26km².
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Land Type Conversion, Phased Implementation Expansion. The integration of land resources, to reconsider the land use optimization, change or influence the unreasonable use of wetland ecological pattern of land type, conversion or replacement of its using method of ecological technology and ecological engineering, will be incorporated into the wetland water recovery range at the same time to use the original natural wetland was reduced by Arcgis software. The terrain elevation analysis function, make analysis on the wetland regional waters into the necessity and possibility, according to the degree of difficulty of wetland restoration, the implementation phases to repair the water space.
Constructing Wetland Ecological Corridor, Connecting Ecological Space. The natural landscape elements are the basis, to build different levels of ecological corridor as the spatial framework, regional ecological network planning of wetland. The mountain, water is an important natural Hui-xian wetland landscape element, in order to strengthen the continuity of wetland ecology, establish two main ecological corridor space. One of them is by the river. A ditch, lake waters in the main space ecological corridor, the other one is composed of nine-head mountain and da-chang mountain mainly to build the mountain ecological corridor. In addition, the local planning secondary ecological corridor and ecological corridor, to promote wetland biological material, information, energy flow.

Landscape Classification, Adjust the Layout of Wetlands. According to the natural landscape resources category, classification protection, and the characteristics of landscape resources, strengthen their personality. At the same time, focus on landscape spatial coordination on collocation, avoid landscape features in the space of the conflict, in order to all-round, multi angle to show the Hui-xian wetland area of natural landscape, highlighting its landscape features.

Conclusion
(1) Hui-xian wetland formation has a long history, unique natural landscape, an important ecological niche, high aesthetic value. But under the long-term intervention of the human and nature, and gradually to the artificial wetland fragmentation.
(2) From the historical evolution, ecological protection, three aspects of landscape aesthetics, respectively, of Hui-xian wetland spatial recovery range is demonstrated. By overlay analysis of the above results, the final draw will range Xian theory should restore the wetland area and 39.2km².
(3) From the national policy guidance to local development strategy, Hui-xian wetland ecological tourism exhibition will be built, Wetland National Wetland Park, as well as the ASEAN International Tourism Conference reception base.
(4) According to the principle of coordinating development, protecting the arable land, local conditions and development trend in the future, and to meet the ecological requirements, social function, landscape aesthetics, finally delineating the wetland restoration area, namely the 26km². It has great significance for guiding the rational development utilization and making protection plan of wetland.

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