### The Application of Modern Information Technology in the Protection of Wild Plants

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Abstract: With the rapid development of information technology, its application in the field of wild plant protection has become increasingly important. This study aims to explore the application of modern information technology in wild plant protection, with a particular focus on the specific applications of remote sensing technology, geographic information system (GIS) technology, and machine learning technology, as well as their impact on improving protection efficiency and accuracy. This study adopts the methods of literature review and case analysis to systematically review the practical of information application modern plant technology wild in protection, including examples of remote sensing technology, GIS technology, and machine learning technology. Remote sensing technology can monitor the growth status of wild plants in real time and timely understand their distribution and changes in the growth environment. This technology has been widely used for illegal harvesting monitoring and habitat protection of wild plants. GIS technology has significant advantages in analyzing and displaying the geographical distribution, growth environment, and ecological characteristics of wild plants. This technology has helped multiple wildlife conservation projects achieve precise management and delineation of protected areas. Machine learning technology has demonstrated efficient capabilities in data analysis and processing, especially in identifying issues such as abnormal growth of wild plants and pests and diseases. In addition, machine learning also helps predict the population size of wild plants and provides data support for formulating conservation

strategies. Modern information technology, especially remote sensing technology, GIS technology, and machine learning technology. In the future, should further explore the integrated application of these technologies and solve the challenges encountered in practical work, such as insufficient data and difficult algorithm selection, to contribute to global wildlife conservation.

Keywords: Wild Plant Protection; Modern Information Technology; Remote Sensing Technique; GIS Technology; Machine Learning Technology

#### 1. Introduction

With the rapid development of information technology, its application in various fields is becoming increasingly widespread, among which the field of wild plant protection has also benefited greatly. Wild plants, as an important component of nature, are of great significance in maintaining ecological balance and providing ecological services. However, the excessive development and utilization of wild plant resources pose a serious threat to their living environment, and the issue of wild plant protection is becoming increasingly prominent. The application of modern wild information technology in plant protection can effectively improve the efficiency and accuracy of wild plant protection. Through remote sensing technology, it is possible to monitor the growth status of wild plants in real time, understand their distribution and changes in the growth environment; Through IoT technology, real-time monitoring of wild plants can be achieved to prevent them from being illegally picked and damaged; Through big data technology, the quantity, distribution, and

growth status of wild plant resources can be analyzed, providing scientific basis for the protection of wild plants [1].

The application of modern information technology provides new technological means and tools for the protection of wild plants, which is of great significance in improving the efficiency and accuracy of wild plant protection, protecting wild plant resources, and maintaining ecological balance.

#### 2. Application of Remote Sensing Technology in Wild Plant Protection

#### 2.1 Definition and Principles of Remote Sensing Technology

Remote sensing technology refers to a technology that obtains surface and environmental information through non-contact or contact methods, including the detection, processing, and analysis of electromagnetic waves. Remote sensing technology can obtain a large amount of geographic information, such as terrain, landforms, vegetation, hydrology, meteorology, etc., which can provide important support for natural resource management, environmental protection, urban planning, and other fields [2].

Remote sensing technology is a technology that utilizes electromagnetic waves for detection and information acquisition. Its principles include the propagation, reflection, transmission, scattering, and combination of reflection and transmission of electromagnetic waves [3]. These principles can be used to obtain surface and environmental information, providing important support for natural resource management, environmental protection, urban planning, and other fields.

## 2.2 Application of Remote Sensing Technology

Remote sensing technology has broad application prospects in the application of modern information technology in wild plant protection. Remote sensing technology can monitor the distribution and growth of wild plants in real-time, providing accurate data support for conservation work. For example, remote sensing technology can monitor the distribution range, growth status, and threat level of wild plants, providing a basis for formulating protection strategies. In addition, remote sensing technology can also monitor the habitats of wild plants in real time to prevent human activities from causing damage to them. Remote sensing technology can also be used for the protection and management of wild plants [4]. For example, remote sensing technology monitor can the growth environment of wild plants, providing a basis for formulating protection and management In addition, remote sensing measures. technology can also monitor the population size of wild plants, providing a basis for formulating protection and management measures.

Remote sensing technology plays an important role in the application of modern information technology in the protection of wild plants. It can help us better understand the distribution and growth of wild plants, and provide accurate data support for formulating protection and management measures. At the same time, remote sensing technology can also be used for the protection and management of wild plants, as well as the protection of wild plant germplasm resources. [5] Therefore, remote sensing technology has important application prospects in the application of modern information technology in wild plant protection.

#### 2.3 Advantages and Limitations of Remote Sensing Technology in Wild Plant Protection

Remote sensing technology is a technology that detects surface information of the Earth through electromagnetic waves, and its application in wild plant protection is becoming increasingly widespread. There are obvious advantages in the protection of wild plants. Remote sensing technology can obtain a large amount of information in a short period of time and cover a wide range, which makes the protection of wild plants more efficient; Remote sensing technology can monitor the growth status of plants in real time, which is very important for the protection of wild plants; Remote sensing technology does not cause damage to plants, making it suitable for the protection of wild plants; Remote sensing technology can be used multiple times, making wild plant protection work more stable [6,7].

However, remote sensing technology also has some limitations in the protection of wild plants. Firstly, the resolution of remote sensing technology is limited, which makes it difficult for remote sensing images to clearly display the details of plants, which may affect the protection of wild plants. Secondly, remote sensing technology requires a large amount of data support, which may increase the difficulty of data processing and analysis, which may affect the efficiency of wildlife conservation work. Finally, remote sensing technology relies on satellites and other equipment, which may be affected by weather and other factors, which may affect the use of remote sensing technology [8].

Remote sensing technology has many advantages in wild plant protection, but there are also some limitations. Therefore, in the protection of wild plants, it is necessary to comprehensively consider the advantages and disadvantages of remote sensing technology and take appropriate measures to maximize the advantages of remote sensing technology.

#### **3.** Application of Geographic Information System Technology in Wild Plant Protection

#### **3.1 Definition and Principles of Geographic Information System Technology**

Geographic Information System (GIS) is a spatial information system that collects, stores, manages, analyzes, and describes data related to the Earth's surface and geographic distribution. It is a computer technology system that enables the collection, management, analysis, and application of geographic information. It can effectively analyze and process geographic spatial data, provide decision support, and provide a means for the collection, processing, management, and application of geographic information [9]. GIS is a geospatial information system based on computer technology and geographical principles, which can effectively analyze and process geospatial data, provide decision support, and provide a means for the collection, processing, management, and application of geographic information. The principles of GIS include geographic data modeling, geographic information collection, geographic information storage, geographic information management. geographic information analysis, and geographic information visualization.

#### **3.2 Application of Geographic Information** System Technology

In the protection of wild plants, GIS technology can be used to analyze the distribution and growth environment of wild plants. By analyzing the distribution data of wild plants, the growth range and suitable growth areas of wild plants can be determined, thereby formulating more effective protection measures. Meanwhile, by analyzing the growth environment of wild plants, can understand their growth habits and adaptability to the environment, thereby better protecting plants [10].

GIS technology can also be used for the protection and management of wild plants. The protection and management of wild plants require monitoring and management of their growth status, reproductive status, etc. Through GIS technology, real-time monitoring of the growth status of wild plants can be achieved, and problems can be identified and addressed in a timely manner. Meanwhile, GIS technology can also be used for the management and protection of wild plants, such as developing protection areas and measures for wild plants, and managing and protecting these areas.

In addition, GIS technology can also be used for education on the protection of wild plants. Through the application of GIS technology, various maps and images related to wild plants can be created for protection education and promotion. These maps and images can display information on the growth environment, distribution range, growth habits, and other aspects of wild plants, helping people better understand and recognize them, thereby enhancing their awareness of conservation and action.

GIS technology is widely used in the protection of wild plants, which can be used for analyzing the distribution and growth environment of wild plants, protecting and managing wild plants, educating and promoting the protection of wild plants, and other aspects. Through the application of GIS technology, can better understand wild plants, formulate more effective protection measures, and thus protect the ecological environment and biodiversity of wild plants.

# **3.3** Advantages and Limitations of Geographic Information System Technology in Wild Plant Protection

Geographic Information System (GIS) is a

widely used technology for wild plant protection, which can be used to collect, store, analyze, and display information on the geographic distribution, growth environment, ecological characteristics, and other aspects of wild plants, providing strong support for the protection and management of wild plants. Its advantages are reflected in data collection and processing capabilities, spatial analysis capabilities, map visualization capabilities, collaborative management capabilities, and so on [11].

The data quality and availability of GIS are challenges faced in wildlife conservation. The distribution and growth environment of wild plants may have inaccurate or incomplete information, which can affect the accuracy and reliability of GIS. In addition, some key data may only be held by some institutions or organizations, resulting in incomplete or unavailable data; GIS requires the use of advanced technologies and software, such as geographic information system software, geographic databases, geographic models, etc. The use of these technologies and software requires a certain level of technical and professional knowledge. In addition, the data analysis results of GIS may require complex calculations and analysis, which may affect its usability and ease of use; The geographic information involved in wild plant protection may include sensitive or private information [12], such as the habitat, quantity, distribution, etc. of wild plants. This requires security management and protection to prevent its leakage or misuse.

The application of GIS in wild plant protection has advantages such as data collection and processing capabilities, spatial analysis capabilities, map visualization capabilities, and collaborative management capabilities. However, there are also certain limitations in data quality and availability, technological limitations, and the security and privacy of geographic information [13].

#### 4. Machine Learning Technologies

The application of modern information technology in wild plant protection, especially the application of machine learning technology, has achieved significant results. Wild plants are an important component of natural ecosystems, and are of great significance for maintaining biodiversity and protecting ecological balance. However, the protection of wild plants faces many challenges, such as illegal logging, habitat destruction, climate change, and so on. In order to effectively protect wild plants, it is particularly important to use modern information technology, especially machine learning technology, for intelligent monitoring and protection [14].

application of machine learning The technology in wild plant protection can improve monitoring efficiency and accuracy. By utilizing sensors, cameras, and other devices, real-time information on the growth, distribution, and health status of wild plants can be collected. Then, by analyzing and processing these data through machine learning algorithms, it is possible to quickly identify issues such as abnormal growth and pests of wild plants, providing a basis for timely protective measures. In addition, machine learning technology can also predict the population size of wild plants, providing data support for formulating reasonable conservation strategies.

Machine learning technology can also improve risk assessment and early warning capabilities in wild plant protection. By collecting and analyzing historical data, machine learning techniques can identify potential risks and issues in wild plant protection, provide early warning, and take corresponding measures. For example, for illegal logging and other behaviors, machine learning technology can analyze information such as the time, location, and method of logging, providing clues for law enforcement agencies and improving the efficiency of combating illegal logging.

Machine learning technology can also achieve intelligence in wild plant protection. By combining machine learning technology with technologies such as the Internet of Things and big data, real-time monitoring, intelligent warning, and automatic alarm functions for wild plants can be achieved, improving the intelligence level of wild plant protection.

However, despite the enormous potential of machine learning technology in wild plant protection, there are still some problems and challenges in practical application [15], such as insufficient data, difficult algorithm selection, and insufficient model interpretability. Therefore, in the future, it is necessary to further research and improve the application of machine learning technology in wild plant protection, in order to improve protection efficiency and accuracy, and better protect wild plant resources.

#### 5. Conclusion

The application of information technology in wild plant protection provides a new perspective and means for plant protection. For example, by utilizing multimedia technologies such as floating text production, pattern text production, and Flash techniques, students can gain a deeper understanding of plant protection related knowledge and principles, and cultivate operational skills. In addition, open experiments help students understand the important connection between mobile networks and plant protection technology, and become proficient in using mobile networks to obtain plant protection information resources.

The application of information technology in wild plant protection can effectively improve the efficiency and effectiveness of plant protection. By developing and utilizing information technology, the pace of agricultural technological innovation can be accelerated, providing more scientific and effective technological means for plant protection. For example, the application of remote sensing technology and communication technology in wild plant protection can achieve real-time monitoring and early warning of plant growth environment, thereby improving the pertinence and effectiveness of plant protection.

The application of information technology in wild plant protection can help promote the development of agricultural modernization. Agricultural modernization is an inevitable trend in the current development of agriculture, and the widespread application of information agriculture technology in undoubtedly provides strong support for agricultural modernization. At the same time, the application of information technology in wild plant protection also reflects continuous development and progress in the field of information technology application, demonstrating firm determination and strong strength in scientific and technological innovation and comprehensive national strength enhancement.

In summary, the application of modern information technology in wild plant

protection not only provides a new perspective and means for plant protection, improves the efficiency and effectiveness of plant protection, but also promotes the development of agricultural modernization, demonstrating strong strength in the field of information technology application.

#### Acknowledgments

This work was supported by the Forestry and Grassland Ecological Protection and Restoration Project (2024).

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