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Exploration of Nature Education Path for Teenagers: A Case Study of Yancheng Wetland Nature Education Based on the World Natural Heritage Site

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Abstract Nature education is the trend of the current social development. By gradually improving the awareness of ecological civilization among the whole people, the achievements in ecological civilization are jointly built and shared by the whole people. Yancheng Yellow Sea Wetland is a characteristic natural resource and the name card of Yancheng City, and also an important part of the natural education of teenagers in Yancheng. As one of the main resources of nature education in Yancheng, the Yellow Sea Wetland World Natural Heritage resources play a more important role in the cultivation of youth ecological civilization values and legal awareness of environmental protection. Based on the protection and utilization of the Yellow Sea Wetland World Natural Heritage resources, this paper explores the methods and approaches of nature education for teenagers in Yancheng.

Key words Nature education, Yellow sea wetland, World natural heritage

1 Introduction

As an educational process, nature education takes the natural environment as the background and human beings as the medium, uses scientific and effective methods, realizes the effective collection, arrangement and weaving of natural information through systematic means, and forms the effective logical thinking of social life^[1]. Nature education is the trend of the current social development. It is an important embodiment of implementing Xi Jinping's thought on ecological civilization, improving the national awareness of ecological civilization, and promoting the joint construction and sharing of ecological civilization by the whole people. In 2021, the State Council officially issued the *Outline of a National Campaign for Scientific Literacy (2021–2035)*, which draws up a new blueprint for the construction of scientific literacy in the next 15 years, and puts forward the hard target of "the level of citizens' scientific literacy will exceed 15% by 2025 and reach 25% by 2035", which puts forward clear requirements for the development of natural science education, especially for the promotion of natural education for young people in various protection areas. Many provinces and cities across the country have also included natural science education into the key work content during the 14th Five-Year Plan period, and issued corresponding policy guidance documents. Yancheng takes the fundamental purpose of cultivating virtue and cultivating people, fully relies on regional culture, and carries out wetland science

popularization and research according to local conditions through overall coordination and integration of resources, so that the majority of primary and secondary school students can feel the development and changes of regional culture and hometown in wetland science popularization, stimulate scientific interest, enlighten scientific concepts, and cultivate innovative spirit and scientific literacy in perception and exploration.

2 Analysis of the development status quo of nature education

2.1 Late start of natural education in China and backward development In the middle of the 19th century, with the development of the nature learning movement, protection education movement and environmental protection movement in the USA, environmental education was vigorously promoted, and the development has basically become the consensus of the whole people. In the 1960s, nature conservation education began in Japan, and natural science schools began to rise and developed rapidly throughout the country, becoming the main force to promote the development of nature education in Japan. Compared with the mature environmental education status in the USA, Japan and other countries, the most obvious difference in natural education in China is its late start and relatively backward development. Since 2010, domestic natural education institutions have begun to learn from the experience of other countries and promote practical projects of natural experience, but they have lagged behind in theoretical research, practical exploration and nationwide promotion^[1]. Natural education service ability is weak. It mainly includes the lack of professional talents in nature education, incomplete infrastructure construction, etc. Most activities are mainly natural observation, with monotonous content and single form.

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Therefore, the current natural education system in China urgently needs to solve the problems of the theory of youth natural education system and the training system of high-quality natural education talents that match the concept of green ecological development in the new era.

2.2 Lack of legislation and norms, and weak supervision and binding force Internationally, the USA, Japan, South Korea, the Philippines, Brazil and other countries have introduced special environmental education legislation. In 1970, the *National Environmental Education Act* of the USA became the world first special legislation on environmental education, which also marked that the USA became the first country to promote environmental education in the form of legislation. In 2003, Japan issued the *Law on Promoting Environmental Passion and Promoting Environmental Education*, making it the first Asian country to awaken the issue of environmental education^[2]. In order to ensure the healthy development of the industry and create a stable market environment, in November 2018, the National Nature Education Network collected and issued the *Nature Education Self-discipline Convention*. Because it is not mandatory, it only relies on the self-supervision and restraint of practitioners, the achievements are little. At present, Ningxia, Tianjin, Xiamen, Luoyang, Guangdong and other places have formulated local regulations on environmental education successively, and special national laws and regulations on environmental education have not been issued yet. According to the *Research Report on the Public Will of Environmental Education Legislation*, which was launched in June 2020, more than 90 percent of respondents believe that China should introduce the *National Environmental Education Law* as soon as possible, and be willing to participate in publicity, training, visits, online learning and other activities.

2.3 No practice mode and not systematic organizational structure The practice model of nature education in the United States of America is "school teaching – nature school – society". Japan implements the natural experiential environmental education practice mode of "natural school – society – community". Australia's collaborative nature education practices are "sustainable school – community – family". South Korea is rich in forest resources, forming a special "forest experience type" nature education practice model. The nature education practice in the Philippines is the "national service training program – school education – community and citizen"^[3]. Drawing on the experience of other countries, China is currently in the exploration of the practice mode of nature education. Schools around the country have begun to attach importance to the integration of nature education concepts, and some regions with rapid development of natural education have formed a unique practice mode. However, the practice mode of nature education in China has not been fully formed, and the actual operation cannot form a unified standard system.

2.4 Nature education ability based on protected natural areas urgently needing to be improved Natural protected area has

a good ecological natural environment, can realize the basic mission function, but part of the protected area lack of natural education facilities and service facilities, such as interpretation system, the natural experience of interactive space, natural observation observatory and equipment and provide participants with catering, accommodation, *etc.* In addition, most of the people who participate in nature education are teenagers, and need to guarantee their personal safety at all times during the study period. However, the personnel are not sufficient, and there is no special nature education management organization, so it is not able to guarantee the safety of teenagers in the protection area. Furthermore, there is a lack of professional foundation for natural education, and most institutions and practitioners have no professional foundation and background. This situation is not only limited to the protected natural area system, but a common situation in the natural education industry in China. Nature reserves are even more short of talents and cannot meet the needs of diversified nature education.

3 Yancheng Yellow Sea Wetland World Natural Heritage Site is rich in natural and ecological resources

Wetland is known as the "kidney of the earth", and is known as the world three major ecosystems together with forests and oceans. It is a natural "water filter" with important ecological functions such as water conservation, water purification, biodiversity maintenance, flood storage and drought prevention, climate regulation and carbon storage and carbon sequestration. It is an important habitat for mammals, amphibians, birds, insects, and an ideal destination for birds in long-distance migration. Meanwhile, it also plays a positive impact on human survival and development^[4]. Yancheng Yellow Sea Wetland not only contains rich natural resources, but also has unique ecological environment effect. It is the ecosystem with the highest productivity, the most abundant biodiversity and the most protection value in the world. The municipal wetland area is 769 600 ha, and the natural wetland protection rate is 62%. It is the coastal wetland with the largest area on the west coast of the Pacific Ocean and the edge of the Asian continent and the best ecological protection. Yancheng is a city growing on wetlands. At present, it has two national wetland nature reserves and one prefecture-level city of world natural heritage. On July 2019, China's Yellow (Bohai) Sea migratory bird habitat (Phase I) was included in the *World Heritage List*, filling the gap of China coastal wetland heritage, and marking the "zero breakthrough" of China's world natural heritage from land to ocean^[5]. On November 2022, the secretariat of the Conference of the Parties to the Convention on Wetlands issued the International Wetland City certificate to Yancheng. The successful establishment of Yancheng as an international wetland city is a successful practice of building a modernization of harmonious coexistence between man and nature, and provides urban samples and examples for the integration of wetland protection into urban development.

3.1 Jiangsu Dafeng Elk National Nature Reserve Located in the South Yellow Sea Wetland, one of the four major wetlands in China, it is the largest elk nature reserve in the world and a national 5A-rated tourist attraction. By the end of May 2023, the reserve had a total of 7 033 elks, of which the wild elk population reached 3 116.

3.2 Jiangsu Yancheng Wetland and Rare Birds National Nature Reserve Located in the central coastal area of Jiangsu Province, Jiangsu Yancheng Wetland and Rare Birds National Nature Reserve mainly protects rare wild animals such as red-crowned cranes and the tidal flat wetland ecosystem for their survival. There are 450 species of plants, 85 species of wildlife under secondary national key protection, 402 species of birds, 26 species of amphibians and reptiles, and 31 species of mammals, which can be called a genetic treasure house of biological resources. With the magnificent Yellow Sea beach, the vast and mysterious "red carpet" and the wild animals everywhere, it has always been known as "the capital of wetlands and crane home".

3.3 Tiaozini Wetland scenic spot Tiaozini Wetland is one of the most important coastal wetland ecosystem in the world, filling the gap of national coastal wetland world natural heritage. In Tiaozini Wetland, there is the world's rare landform — radiation sand ridge group, there are "a line of tide", "two water", "tidal forest" and other unique coastal landform landscape. Every year, millions of birds stop, stop and breed, including rare species such as spoon-billed, green-foot and black-billed gulls. Among the 410 species observed, 193 are water birds, more than 80% of the East Asia – Australia migratory zone. It specially provides 48 ha area for micro-terrain transformation, environmental remediation and closed management, creating the first fixed high tide migratory bird habitat in China; In addition, it strengthens the protection of 200 ha of black-headed gulls breeding ground and 666.7 ha of goose and duck migratory birds high tide habitat.

4 Exploration of the natural education path based on the Yellow Sea Wetland World Natural Heritage Site

4.1 Integrating disciplines, improving the theoretical system of natural education, and establishing the training mode of compound talents

Nature education involves pedagogy, psychology, agronomy, law, geology, landscape architecture and other disciplines, with a wide range and comprehensive scope. Thus, it is necessary to carry out systematic research on scientific theories related to nature education, understand and master the basic laws of nature education development, integrate and penetrate multiple disciplines, expand the depth and breadth of nature education research, timely adjust the direction of sustainable development, and gradually form a nature education theory system and talent training mode in line with China's national conditions. Through talent introduction and instructor training, train professional teachers and talents with relevant knowledge and skills of

natural education, make them have scientific mind, artistic interest, quality and craftsman spirit and can plan and carry out colorful and distinctive natural education activities according to local conditions; accelerate the construction of knowledge, skilled, innovative and professional backbone talent team, to provide qualified professionals for the natural education industry and lay a talent foundation for the cause of natural education.

In December 2019, Yancheng Normal University established Wetland College to explore the "3 + X" tutorial system and set up PRP (Participation in Research Program) courses. Students can participate in scientific research based on their interests, focusing on theoretical research, application or thinking mode, cultivating scientific thinking ability, hands-on ability, teamwork ability and interdisciplinary ability, exploring practical talent training mode, and cultivating excellent talents who can serve wetland protection and the construction of ecological civilization in beautiful China.

In April 2021, Yancheng City established a coordination group for wetland nature education for primary and secondary school students led by the Bureau of Education, with the participation of the National Development and Reform Commission, the Public Security Bureau, the Finance Bureau, the Transport Bureau, the Culture and Tourism Bureau, the Health Commission, the Market Supervision Bureau, the Banking and Insurance Regulatory Sub – Bureau, the Youth League Committee, the Association for Science and Technology and other relevant departments, responsible for the overall planning and management guidance of the wetland nature education work for primary and secondary school students in the city, and jointly promoting the development of wetland nature education. The education administrative departments of all counties (cities and districts) take the lead in coordinating and organizing the implementation of wetland nature education for primary and secondary school students in their respective areas. All primary and secondary schools shall establish special institutions, formulate implementation plans based on the actual conditions of the region, school and student conditions, establish relevant systems, actively organize implementation, accelerate the formation of a government-led, departmental division of labor and responsibility, multi-channel and all-round cooperation mechanism, increase the overall planning and scientific management of wetland science popularization and research, and gradually build the "Yancheng Model" wetland nature education practice and theoretical system.

4.2 Formulating and releasing relevant standards to promote the standardization and standardization of nature education

Systemization and standardization are the catalyst for the comprehensive development of nature education. People's understanding of natural knowledge from demand, and even the formation of ideology, the most important thing is the application of education methods in the learning process. A good education method can avoid boring rote memorization, integrate knowledge into prac-

tice, teaching through fun, so as to truly wander in the ocean of knowledge without feeling boring. The formation of systematic and standardized natural education mode is an effective means to promote the comprehensive and rapid development of natural education. It has become a key field and urgent problem for the development of the industry to analyze the needs of the industry, and to develop and release the series of standards, guidelines and norms of the natural education industry. At present, the State Forestry and Grassland Administration has issued two natural education group standards: *Guidelines for the Construction of Forest-type Nature Education Bases* and *Standard for the Setting of Nature Education Labels*. The development of standards such as the *Standards for the Management of Nature Education Volunteer Services*, *Professional Standards for Nature Educators* and *Guidelines for the Construction of Wetland Nature Education Bases* are also actively advancing. Jiangsu Agricultural Society, Forestry Society, Ecological Society, Geological Society, Science Writers Association, *etc.* jointly formulated the *Detailed Rules for the Training and Certification of Nature Education Instructors*, to promote the standardized and professional development of nature education work in nature reserves, popular science venues, volunteers, and social organizations.

In April 2021, Yancheng City issued the *Implementation Opinions on Promoting the Science Popularization and Study of Primary and Middle School Students in the City*, requiring that in accordance with the *Notice on Strengthening the Organization and Management of Large Gatherings and Off-campus Activities in Municipal Schools*, there is a plan for activities, a record before departure, and a plan for emergency response", and carry out preparations in seven aspects, including advance investigation, safety education, activity plan, activity vehicle qualification review, safety emergency plan, signature receipt of students' parents, and accidental injury insurance. Besides, it is necessary to form written supporting materials, and report them to the education administrative department for filing and review one week in advance in accordance with the *Approval Form for Large-scale Off-campus Activities of Schools*. In the form of parents' committees, a letter to parents, parents' meetings, "school information communication" (Xiaoxintong) platforms, *etc.*, should be informed of the research theme, the significance of activities, the time arrangement, travel routes, expenses, precautions, and other relevant information on wetland science popularization research, strengthen the participation in the pre-training and post-assessment of teachers and students, and allocate a certain proportion of school leading cadres, teachers, safety officers and parent volunteers to be responsible for the management and safety of student activities. In summary, it is necessary to explore the formulation of wetland nature education work regulations for primary and secondary school students in the region.

4.3 Gathering social resources, building a platform for diversified social participation, and expanding the effectiveness

of natural education The active participation of social resources, especially scientific research institutes, is an effective way to develop natural education. At the same time, relevant government departments should also establish a coordination mechanism, effectively enhance overall coordination and management guidance, strengthen the communication between departments, industries and communities, explore the paths and strategies of inter-departmental cooperation, and jointly build a natural education system with Chinese characteristics. Yancheng according to the wetland, natural education goal, relying on Yancheng Yellow Sea (Bohai) world natural heritage resources, reserves, wetland college, high-tech enterprises, scientific research institutions, science and technology museum and wetland museum, select the construction of a batch of safe appropriate knowledge science type, experience type, motivational development, natural ornamental, cultural recreation students wetland natural education base, wetland natural education first demonstration area and wetland natural education base to create activities. The access system shall be implemented for the base, the dynamic management shall be implemented, and the regular evaluation and acceptance shall be conducted. The service undertaking units and the base shall be regularly evaluated in multi-aspects, and the evaluation results shall be used as the basis for access and exit. A number of qualified and reputable enterprises or institutions shall be identified, clarifying that enterprises or institutions shall assume the safety responsibility of wetland natural education for students, and entrust them to assist schools to carry out wetland natural education activities and provide menu-style services for schools.

4.4 Enriching the connotation, improving the system, demonstrating and leading the wetland, and comprehensively improving the natural education

Nature education is an important function and central task of the construction of protected natural areas. Relying on important ecosystems of protected natural areas, rare and endangered species and natural relics, it has become a good platform for carrying out natural education and provided a new way for the sustainable development of protected natural areas. Yancheng City takes the Yellow Sea Wetland natural heritage site as an important support, makes full use of natural reserves, forest parks and other characteristic natural resources, builds a nature education promotion mechanism with government leadership, departmental cooperation and social participation, and deepens ecological public welfare activities such as nature education and science popularization. Together with schools, scientific research institutions, enterprises and other institutions, Yancheng City develops and designs various nature education courses, creates a number of demonstration wetland science research quality lines, gradually forming a reasonable layout and interconnected wetland science popularization and research network. Furthermore, it carries out wetland nature education activities step by step according to the different student section, to further promote and deepen nature education, and demonstrate and lead all kinds

of nature reserves to give full play to their ecological service functions.

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ers, not only in terms of language skills and tourism etiquette, but also in learning professional knowledge related to red tourism, and building a tourism service team with high professional quality. It should standardize the service quality supervision system within the scenic area, establish a reward and punishment mechanism, and improve the service level of hotel employees.

5.4 Enhancing the effectiveness of media promotion in scenic areas It should make good use of new media platforms to vigorously promote the red spirit and history of the Yimeng region. On the most popular platforms such as Tiktok and Today’s Headlines, it can effectively mobilize the patriotic feelings of the audience and improve people’s awareness of Yimeng’s red culture by making excellent promotional short films of Yimeng’s red history and stories of red characters. It should grasp the psychology and characteristics of the audience, and condense the grand and heavy red spirit into a short and concise video form, so as to see the big from the small and understand from the small, and generate strong interest in the audience. In addition, excellent articles on the red history and spirit of Yimeng can be regularly launched through online platforms such as Weibo and WeChat, in order to attract more

people to travel to Yimeng.

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