

## **Conservation Education Media: Birdwatching Guidebook in the Buffer Zone of the Rawa Danau Nature Reserve**

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### **Abstract**

Rawa Danau Nature Reserve is a conservation area that protects various remaining flora and fauna on Java island, including birds. However, at present, Rawa Danau Nature Reserve 's existence is threatened due to changes in the structure and habitat function by the activities of the surrounding community. Therefore, it is necessary to have a solution in the form of efforts to preserve and preserve the diversity of species and their ecosystems. One form of this program is conservation education. Conservation education is a form of effort to protect biodiversity and natural resources by increasing knowledge, skills, participation, attitudes, and awareness of the importance of natural resources to sustain life. Information media is needed to facilitate the achievement of conservation education goals, one of which is the development of a birdwatching field guidebook. This study aimed to develop a birdwatching field guidebook as a medium for conservation education in the Rawa Danau Nature Reserve area. The development method was used to create the field manual. The developed guidebook contains information on bird diversity, bird conservation, observation techniques, and bird observation locations, as well as bird identification sheets accompanied by bird distribution patterns in the form of descriptions and illustrative pictures or photographs of research results. The book was also developed to meet the principles of environmental education, namely to develop awareness, knowledge, attitudes, skills, and participation in protecting the environment.

Keywords: Conservation education media, Birdwatching, Rawa Danau nature reserve

### **INTRODUCTION**

Indonesia is a mega-biodiversity country, which means it has high diversity. To preserve this biodiversity, the Indonesian government has established conservation areas to protect flora, fauna, and the types of ecosystems in them (Astirin, O.P, 2000). Rawa Danau Nature Reserve is one of the conservation areas on the island of Java, which protects the remaining upland freshwater swamps. The habitat type conditions in the Rawa Danau Nature Reserve area are swamp forests and mountainous tropical rain forests, which are the habitat of various remaining flora and fauna. One of the wealth of flora and fauna is a wide variety of bird species. Based on data from the Banten Province Environment and Forestry Service (2018), the diversity of bird species found in the Rawa Danau Nature Reserve area is around 60 species consisting of various types of water birds, forest birds, and raptors. Another attraction of the Rawa Danau Nature Reserve area is that it is a cross-migration area for thousands of birds of prey or raptors

from September to November, which are dominated by the Asian Madurese Eagle and Alap Eagle, and other raptor species (Purwanto, 2016).

Based on the results of interviews with the staff of the Serang Natural Resources Conservation Agency, it was found that birds in the Rawa Danau Nature Reserve area have high diversity but are currently threatened due to changes in the structure and function of the habitat in the Rawa Danau Nature Reserve area. This change was caused by the community using conservation area land to become private land in the form of rice fields and fields and timber theft. Another disturbance is poaching to meet the economic needs of the people around the area. One of these actions is caused by the community's low awareness of the importance of existing biodiversity. Therefore it is necessary to have a solution in the form of efforts to conserve and preserve species diversity and their ecosystems in accordance with Government Regulation no. 7 of 1999 concerning the preservation of plant and animal species (Republic of Indonesia, 1999).

Efforts to preserve and preserve conservation areas require community participation. One form of program in conservation efforts that involve the community is conservation education. Conservation education is a form of effort to protect biodiversity and natural resources by increasing knowledge, skills, participation, attitudes, and awareness of the importance of natural resources to sustain life. (Rachman, 2013). Conservation education programs can be carried out in formal and non-formal forms in accordance with the objectives. Conservation education is carried out formally in schools using lecture methods, presentations, and other forms of learning. Non-formal forms of conservation education can be carried out by involving the community. One form of activity that can include the community is birdwatching. Birdwatching is an activity to identify and observe birds in their natural habitat. According to Cordell & Herbert's (2002) study, birdwatching is an activity that can raise awareness and, at the same time, increase the income of local communities. Those interested in birdwatching are groups of people with an education and an income above the average. Therefore they tend to have a high awareness of nature conservation and also spend their money to see birds, which can improve the local community's economy. The research by Steven et al. (2015) and Ocampo-Penuela & Winton (2017) also shows that birdwatching in Colombia can improve the economy of poor people after the civil war and, at the same time, increase awareness of the environment. Furthermore, Mackinnon et al. (2010) revealed that birdwatching is a means of preserving birds in their natural habitat. To make it easier to observe birds, a birdwatching guidebook is needed, which is designed as an information medium that contains pictures and

descriptions of a species to make it easier to identify birds (MacKinnon et al., 2010; Leksono et al., 2021).

Based on this background, this study aimed to develop a birdwatching field guidebook as a medium for conservation education in the Rawa Danau Nature Reserve area. The book's preparation is expected to assist in providing information and education to increase the public's knowledge, skills, participation, attitudes, and awareness.

## **METHOD**

This study uses the Research and Development (R&D) method. The product being developed is a birdwatching guidebook, which contains information on how to observe birds using the principles of conservation education. Data for the development of birdwatching guidebooks are collected using techniques including; Inventory of the diversity of bird species found in the buffer zones of Rawa Danau, CA, as material content in developing a birdwatching guidebook. Interviews to obtain the results of a needs analysis (Need Assessment) using an interview sheet with questions about the problems found in the Rawa Danau Nature Reserve, biodiversity, utilization of natural resources, nature conservation to key person respondents (village officials, Serang Natural Resources Conservation Agency employees, and the community). Questionnaire to obtain data on knowledge of bird diversity, utilization, bird threats, and conservation efforts by the general public using a questionnaire given to the community around the Rawa Danau Nature Reserve area.

## **RESULTS AND DISCUSSION**

The development of a birdwatching guidebook begins with an inventory of the diversity of birds found in the Rawa Danau Nature Reserve buffer zone. There were 60 species (from 13 orders and 28 families) of birds found in the Rawa Danau Nature Reserve which will then be described and identified. These birds are found in various ecosystems: swamp forests, rice fields, and upland tropical forests. Snake cormorants (*Anhinga melanogaster*), egrets (*Egretta garzetta*), and storks (*Leptoptilos javanicus*) are examples of birds that live in freshwater swamp habitats in Rawa Danau Nature Reserve. Bondol (*Lonchura maja*), Cekakak (*Todiramphus chloris*) and kites (*Hirundo rustica*) are bird species that can be found in rice fields. While the hornbill (*Rhyticeros undulatus*) is an example of a bird that can be found in tropical forest habitats. These birds can be a special attraction for birdwatchers in various habitats in the Rawa Danau Nature Reserve buffer area. This is in accordance with the research of Cakici & Harman (2007) in Turkey that birdwatchers will be interested in observing something specific. Likewise, the research by Sitanggang et al. (2020) states that specific birds have the potential to become an

attraction for observation.



Figure 1. Examples of birds found in the Rawa Danau Nature Reserve buffer area as an attraction for birdwatching

The next step is to interview the stakeholder to obtain data on the use and conservation of birds at Rawa Danau Nature Reserve. The results of interviews and questionnaires given to stakeholders stated that the Rawa Danau Nature Reserve management authority had held counseling about conservation at Rawa Danau Nature Reserve. However, in reality, the people around Rawa Danau Nature Reserve were still encroaching on land converted into the plantation and agricultural land in the form of paddy fields and forest destruction, such as felling trees to make firewood and trading for economic needs. In addition, the community around the Rawa Danau Nature Reserve area still hunts birds for pets and food, and is traded illegally. This is due to the level of understanding and the surrounding community's economy, which still needs to improve. Efforts are needed to overcome this by utilizing environmental services to improve the community's economy. Communities will protect biodiversity by themselves if they know the benefits (Kru"ger, 2005). The birds found in the Rawa Danau

Nature Reserve buffer zone can be used as an attraction for bird watchers. Research Biggs, et al. (2011) stated that birdwatching activities in South Africa could reduce the threat of bird extinction because it can bring economic and ecological benefits. Likewise, Puhakka's research, et al. (2011). in Peru, state that birdwatching can improve bird conservation and increase income simultaneously. Research by Son et al. (2011) regarding the development of bird watching combined with conservation education in Vietnam showed that bird watching is very helpful in preserving nature and improving the economy. Likewise, research by Lee et al. (2009) in South Korea, Corey et al. (2018) in the United States, and Hvenegaard et al. (1989) in Canada stated that birdwatching can increase public awareness as well as improve their economy. However, procedures are needed to observe birds in nature so that the birds remain sustainable. Burger research et al. (1995) in New Jersey found that bird watching can disrupt natural bird life, such as mating season, migration, and foraging, if not managed properly. This management includes controlling the duration of observation time and observing from the path that has been provided. The birds will adapt and get used to human presence.

Furthermore, Collins-Kreiner et al. (2013) recommend that bird observations pay attention to the carrying capacity of bird habitats. Therefore we need a guidebook to regulate the procedures for observing birds in nature. A birdwatching field guidebook can help bird watchers carry out bird watching activities in nature (Bernardon & Nassar, 2012). Guidebooks are also very helpful in getting to know more about the birds in that place (Connell, 2009).

In addition, the developed guidebook fulfills the principles of environmental education in accordance with the 1977 Tbilisi convention, which can develop awareness, knowledge, attitudes, skills, and participation in protecting the environment. Awareness aims to assist bird watchers in gaining awareness and sensitivity to the environment. Knowledge aims to gain various experiences and a basic understanding of the environment. Attitude aims to acquire a set of values and a sense of concern for the environment and motivation to play an active role in developing and protecting the environment. Skills aim to acquire skills in identifying and solving environmental problems. Meanwhile, participation aims to encourage community members to be actively involved at all levels in seeking resolutions to environmental problems (Herlanti, 2016). The principles of conservation education are then translated into learning outcomes and learning objectives in the development of a birdwatching guidebook, as shown in Table 1.

Table 1 The Framework of Bird Watching Conservation Education Book

No	Principles of Learning Outcome Conservation Education	Aim
1.	Knowledge <ol style="list-style-type: none"> <li>1. Understand the concept, scope, purpose, and role of conservation education</li> <li>2. Developing the potential for biodiversity in Rawa Danau Nature Reserve buffer areas and efforts to conserve them for Conservation Education</li> <li>3. Associating environmental values that can be applied as a source of information for birdwatching activities in Rawa Danau Nature Reserve buffer areas</li> </ol>	<p>After using the birdwatching guidebook, birdwatchers are able to:</p> <ol style="list-style-type: none"> <li>1. Explain the concept, purpose and scope, and role of bird diversity.</li> <li>2. Identify bird species in the Rawa Danau Nature Reserve buffer zone.</li> <li>3. Determine the benefits of bird species in Rawa Danau Nature Reserve buffer areas.</li> <li>4. Determine efforts to utilize and conserve bird species diversity in Swamp Rawa Danau Nature Reserve buffer areas.</li> </ol>
2	Skills <ol style="list-style-type: none"> <li>1. Carry out efforts to utilize and conserve biodiversity in Rawa Danau Nature Reserve buffer areas</li> <li>2. Apply environmental values that can be applied as a source of information for birdwatching activities.</li> </ol>	<p>After observing birdwatching, they are able to:</p> <ol style="list-style-type: none"> <li>1. Develop the potential of bird diversity for birdwatching in Rawa Danau Nature Reserve buffer areas.</li> <li>2. Carry out efforts to utilize and conserve bird diversity in Rawa Danau Nature Reserve buffer areas.</li> <li>3. Overcome all forms of damage and extinction of bird diversity in Rawa</li> </ol>

No	Principles of Conservation Education	Learning Outcome	Aim	
			Danau Reserve areas.	Nature buffer
3	Awareness	<ol style="list-style-type: none"> <li>1. Put yourself in the practice of Conservation Education values in everyday life</li> <li>2. Expressing concern for the values of conservation education in everyday life</li> </ol>	<p>After making bird observations, they were able to:</p> <ol style="list-style-type: none"> <li>1. Cooperate with community elements and agencies in managing and preserving bird biodiversity in Rawa Danau Nature Reserve buffer areas</li> <li>2. Fostering and making tourists aware to maintain and protect bird sanctuaries in Rawa Danau Nature Reserve buffer areas.</li> <li>3. Set an example to the public in protecting and utilizing bird diversity as a source of life</li> </ol>	
4	Attitudes	<ol style="list-style-type: none"> <li>1. Displaying the values of environmental education in efforts to utilize and preserve biodiversity.</li> <li>2. Act in accordance with environmental values that can be applied in birdwatching</li> </ol>	<p>After making bird observations, they were able to:</p> <ol style="list-style-type: none"> <li>1. Show gratitude to god.</li> <li>2. Show a sense of care and responsibility for preserving bird diversity in the Rawa Danau Nature Reserve buffer zone.</li> <li>3. Maintaining the preservation of bird diversity in the Rawa Danau Nature Reserve buffer zone.</li> </ol>	
5	Participation	<ol style="list-style-type: none"> <li>1. Inviting the entire community financially, morally, and physically to participate in developing conservation areas. Rawa Danau Nature Reserve</li> </ol>	<p>After observing birds, they are able to:</p> <ol style="list-style-type: none"> <li>1. Play an active role in the management of bird diversity in the</li> </ol>	

No	Principles of Conservation Education	Learning Outcome	Aim
		2. 2. Participate actively in protecting and managing natural resources in birdwatching-based Rawa Danau Nature Reserve buffer areas	Rawa Danau Nature Reserve buffer zone. 2. Play an active role in protecting the diversity of birds in the Rawa Danau Nature Reserve buffer zone. 3. Promoting and establishing relationships with various agencies in managing potential birdwatching activities

With the development of the bird observation field guidebook, it is hoped to increase public awareness of bird conservation: Zint et al. 1. (2002) state that conservation education that directly observes nature can increase awareness of biodiversity. Wyner and Desalle (2010) have also developed field ecology-based learning. The result of the model can increase awareness of the environment. Likewise, Trewhella et al. (2005) used the strategy of observing bats in conservation education, and the results can also increase participation in protecting the environment.

According to Anisah (2016), the birdwatching field guidebook as a source of information used in direct learning can increase the users' understanding. With increased understanding, they can eventually change their behavior for the better. The guidebook functions as an opening and developing insight into the learning process (Mulyasa, 2013). In addition, the guidebook also provides information that expands knowledge and provides more concrete learning experiences to stimulate thinking to become more critical and develop (Leksono et al., 2015).

Information sources such as birdwatching guidebooks are very important for the community to enrich knowledge and make getting information about life's events more manageable. The field guidebook developed was packaged based on research results containing information on bird diversity, bird conservation, observation method techniques, bird observation locations, as well as bird identification sheets accompanied by bird distribution patterns in the form of descriptions and illustrations or photographs (Stevenson et al., 2003: Scharf, 2009). The developed field manual can inspire the community to increase their



knowledge, awareness, skills, and behavior and participate in conserving nature through wise conservation education. According to Rachman (2013), manual tools that are applied for direct learning in the field will be more effective in increasing cognitive abilities, awareness, and skills in appreciating nature.

## CONCLUSION

The birdwatching field manual is a medium in conservation education. The development of a birdwatching guidebook for the Rawa Danau Nature Reserve area utilizes local birds with the hope that the local community can participate in protecting existing birds. The developed guidebook contains information on bird diversity, bird conservation, observation method techniques, and bird observation locations, as well as bird identification sheets accompanied by bird distribution patterns in the form of descriptions and illustrative pictures or photos of the results of the research. The book was also developed to meet the principles of environmental education, namely, to develop awareness, knowledge, attitudes, skills, and participation in protecting the environment.

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