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Assessment of Cardak Lagoon for Ecotourism in Northwest Turkey

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Abstract. The paper deals with the features and biodiversity of Cardak Lagoon, which is one of the important wetlands in Turkey. Some 82 bird species belonging to 35 families from 15 orders were found in the Lagoon. In addition to the richness of bird species, the Lagoon differs from other wetlands in terms of its location characteristics and the presence of a sand spit. Although the Lagoon and its surroundings are utilized for sea tourism in summer, no tourism based on bird observation currently exists. Nevertheless, the assets of the Lagoon exhibit considerable potential for ecotourism. This study indicates that the Lagoon and characteristics of the local community provide favorable conditions for ecotourism. We propose that the introduction of ecotourism around the Lagoon will provide better and more controlled use of the environment.

Key words: lagoon, wetland ecosystem, bird diversity, ecotourism.

INTRODUCTION

Wetlands have played an essential role in the development of biological and cultural wealth of our planet. For millennia, wetlands have also provided humanity with a productive medium for activities such as agriculture, animal husbandry, fishing and hunting. In addition to wetlands being favorable with bird diversity, ecotourism and various scientific surveys have recently enabled them to acquire new functions.

Many coastal wetlands around the world were ruined or destroyed, starting in China about 7760 years ago (Z o n g et al., 2007), and in many other coastal areas over the past centuries (W o l a n s k i et al., 2009). In Turkey, wetlands have decreased by 50 % due to drainage projects carried out in the 20th century (A r i, 2006). Despite this ongoing destruction, people today continue to benefit through various activities from those wetlands, which have been preserved. Lagoons, as rare geomorphologic formations, are at the same time regarded as a geographical heritage (D o g a n e r, 2000). There are a total of 72 lagoons in Turkey, covering an area of 36 000 ha, with a coastal length of 8 333 km (B i c k i c i et al., 2010). The overwhelming majority of them vanished due to factors such as incorrect land use and the discharge of industrial, residential and agricultural waste into the area. The result is that some of them have become unusable. Recently, the importance of lagoons for bird migration in Turkey has been recognized. This has enabled them to be taken under protection and gain official conservation

status. The primary lagoons and deltas concerned are: Paradeniz Lagoon-Goksu Delta (Mersin), Yumurtalik Lagoon (Adana), Akyatan Lagoon (Adana) and Dalyan Lagoon (Mugla). Although Turkey has international responsibility for the conservation of lagoons as a signatory of the Ramsar Convention, there are other lagoons and deltas lacking conservation status. These include: Kocacay Delta (Bursa), Gulluk Delta (Mugla), Umurbey Lagoon (Canakkale), and the Delta of Aksin Brook (Canakkale) (Republic of Turkey, Ministry of Culture and Tourism, official website 2009). Cardak Lagoon, which is the focus of this paper, was declared as a Natural Site by the Turkish Ministry of the Environment in 1996.

Today, for an overwhelming majority of the world population, a holiday is considered synonymous with going to the seaside. Both in domestic and foreign tourism, traditionally the most popular places are *Coasts* and the most popular mode of holiday is the *Sun-sea-sand* package holiday (Miller et al., 1991; Ozguc, 2003; Jennings, 2004; Hall et al., 2006; Wolanski et al., 2009). The favorableness of lagoons for sea tourism, due to their being separated from the open sea by a spit, further enhances their touristic attractiveness. For many years, Cardak Lagoon has been the scene of intensive touristic use in summer due to its attractiveness in terms of sea tourism. Since lagoons are convenient media for the feeding and nesting of water birds, some have also opened up to ornithotourism for *bird observation* (Doganer, 2001). Cardak Lagoon offers favorable potential for ornithotourism both of its richness in bird species and its convenient transportation connections with large cities. The development of ecotourism based on bird diversity at Cardak Lagoon will contribute to improve the value, preservation, and management of this natural and biological source.

Handing down this heritage intact to future generations, above all, depends on effective conservation. Natural heritage sites, nature reserves, nationnal parks and wildlife areas play a major role in conserving sensitive ecosystems (Skanavis et al., 2009). The value of Cardak Lagoon for ecotourism can make a positive contribution to the conservation process of the Lagoon and serve as an example for other projects. As is known, ecotourism aids the development of protective approaches to natural environments and helps raise consciousness, thereby contributing to the conservation of natural sites (Mille et al., 1993; Obua, 1997; Bookbinder et al., 1998; Mowforth et al., 2003; Drumm et al., 2004; Zhao et al., 2008; Skanavis et al., 2009), since the future of nature-based tourism is strongly resource-dependent and requires access to high quality natural environments.

Tourism can also benefit conservation because the latter provides an array of resources and attractions that form the basis of any type of nature-based tourism (Priskin, 2001). Both nature-based tourism and ecotourism are extremely important instruments for the conservation of natural environments in Turkey, as in many developing countries (Arslan, 2005; Holden, 2008; Ozcan et al., 2009). As Xu et al. (2009) stated that "The connection between people, parks and tourism has received significant attention in recent years, particularly in developing countries, where it has been linked to sustainable development initiatives and protected area

conservation efforts as well as regional and community development strategies (Ceballos-Lascurain, 1993; Nenon et al., 1993).

Most authors consider *ecotourism* as synonymous with *nature tourism*, ecotourism is generally defined as travelling to undisturbed natural lands with a specific purpose such as viewing, examining and learning about their existing characteristics as well as their sceneries, wild plants and animals (Ozguc, 2003; Masberg et al., 1999). In keeping with an enhanced interest in natural lands today, interest in ecotourism has also increased worldwide. The share of ecotourism within the rapidly-growing tourism industry is on the rise (Isaacs, 2000).

While no statistics are available to determine the total number of tourists that are attracted to nature-orientated holidays around the world, it is estimated that about 20-40 % of participants in international tourism are interested in wildlife. The total amount of expenditure on ecotourism is estimated to be $ 80-166 billions (Ozguc, 2003). Similarly, more than half the U.S. adult population (98 millions) take part in recreational activities centered upon in wetlands, such as hunting, fishing, bird watching or wildlife photography, and spend a total of $ 59.5 billions annually (Jennings, 2004).

Most studies on wetlands in Turkey are quite recent. They include studies on the impact of desiccation on wetlands (Kumerloeve, 1988; Caliskan, 2003; Gurbuz et al., 2004) and those investigating the ecosystem characteristics of particular wetlands (Yigitbasioglu, 1995; Ozesmi et al., 1993).

In addition to proposals for deltas having conservation status (Gurbuz, 2000), Ari (2003) evaluated the interaction between man and the environment in wetlands. Research on the relationship between nature conservation and ecotourism, and on the use and conservation of spits in tourism (Doganer, 2000), suggested a close connection between conservation and ecotourism. On the other hand, studies concerning particular localities are rather limited. They include a study evaluating land use in Cardak (Cavus et al., 2006) and another investigating the potential of Kavak Delta for ecotourism (Ozcan et al., 2009).

The paper is aimed at presenting the ornithofaunal wealth of the Cardak Lagoon and evaluating the potential of the Lagoon for ecotourism based on bird diversity and other factors, which impact this potential.

STUDY AREA

Cardak is located on the northeastern coast of the Canakkale Strait (Dardanelles) separating Europe and Asia in the province of Canakkale, Turkey. The sand spit on the coast of this settlement is 4.3 km in length. Because of the extension of the spit, a lagoon emerged over time. Although the connection of the Lagoon with the sea appears weak (**Fig. 1**), sea water overflows the sand at its weaker points and enters the Lagoon on days when there are strong winds or storms. The Lagoon is located between the coordinates 40° 22' 51" – 40° 23' 36" N and 26° 42' 45" – 26° 44' 18" E and occupies an area of 1.2 km^2.

The study area embracing the Lagoon is bordered by a car ferry pier to the southeast of the lake. To the south it is bordered by the Canakkale-Bursa highway and a secondary road extending from the highway to Zincirbozan military facilities. The rectangular stu-

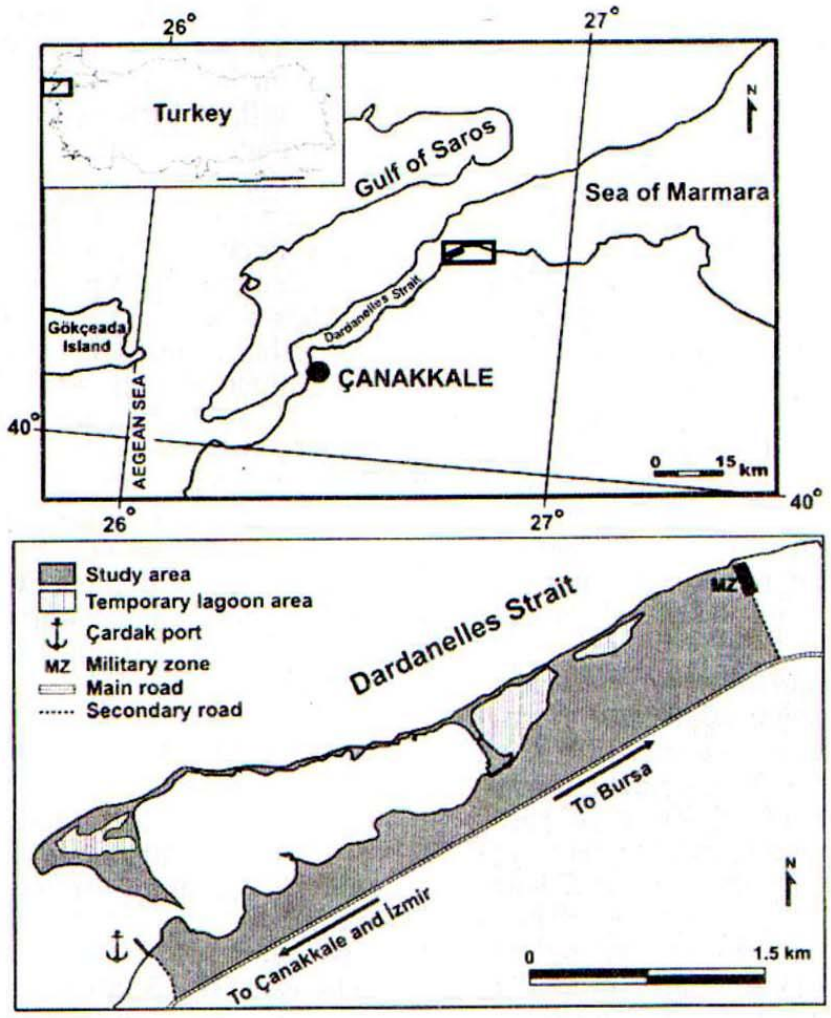

Fig. 1. Location map of study area

dy area is located between the coordinates 40° 22' 41" – 40° 24' 14" N and 26° 42' 22" – 26° 45' 24" E and occupies an area of 3.5 square kilometers (**Fig. 1**). The lake is no deeper than 3 m. While the water level in the Lagoon is higher in summer, the seasonal difference in level is only 20 cm. The level difference due to the tide is insignificant.

The study area exhibits the characteristics of a transition zone between Mediterranean and Black Sea climate types. According to data over a 32-year observation period obtained from Canakkale Meteorological Station, the annual mean temperature is 14.9°C. The mean temperature of January (the coldest month) is 6.3°C, whereas that of July (the hottest month) is 25.0°C. The annual mean rainfall is 595.6 mm. The highest and lowest rainfall occurs in the Lagoon are in December (103.3 mm) and August (4.1 mm), respectively. The annual mean relative humidity is 76 %, and the highest relative humidity is observed in winter. The Lagoon is windy throughout the year, and the long-term annual mean wind speed is 3.9 m/s. The majority of

winds blow in an N-NE direction, while the strongest winds blow in a SW direction (38.7 m/s) (TSMS, 2006). The mean surface temperature of the sea water is 7°C in winter and 24°C in summer in the environment of the Lagoon (B i c k i c i et al., 2010).

METHODOLOGY

The basic research material consisted of data from surveys, observation, and interviews carried out during fieldwork. Recreational activities in the area were observed for one year. Some 50 visitors who arrived in the vicinity of the Lagoon for a holiday in June and July 2009, and 100 members from the local community, were surveyed. Apart from the summer, almost no visitors come to the settlement where the Lagoon is located. Random sampling and face-to-face interviewing techniques were used in the survey. Expressions concerning the touristic aspect of the Lagoon were asked in the survey and responses were measured on a five–point Likert scale, with '1' being *strongly disagree* and '5' *strongly agree*. The data obtained from the surveys also included the profile characteristics of visitors that benefited from the surroundings of the Lagoon. In addition, the research is aimed to determine the attitudes of the local community regarding the relationship between the Lagoon and tourism. Interviews were conducted with those involved in fishing, agriculture and animal husbandry as well as hunters and pension-motel operators around the Lagoon.

During the fieldwork, birds were observed in the period between November 2007 and December 2009. Two binoculars (8*40, 8.2° wide angle Nikon) and a telescope (Meade EXT 70) were used. Observations lasted from sunrise to sunset. Point Counts on a Transect Line, a standard method of bird observation, was applied in the study (A s l a n et al., 2003). A total of 6 observation points were determined: one point on the border of the Lagoon that faces Cardak settlement; one point between the areas of Kuzuluk and Arkagol; 2 points along the sand spit extending parallel to the Strait; and 2 points called Azmaklar located around the wetlands behind the bridge. Observations were made by walking between the specified points throughout the day and spending 15 to 30 min at each. Various sources were used for identification (K i z i r o g l u, 1989; H e i n z e l et al., 2001).

CURRENT USE OF LAGOON AND ITS VICINITY

Cardak is a settlement with a population of 3496 (TurkStat, 2008). Its population exceeds 5000 in summer due to sea tourism. The basic sources of income are the growing of fruit and vegetables, sheep and cattle husbanddry, and fishing and tourism. Although 80 % of local people are involved in agriculture and animal husbandry, tourism offers great potential for the locality.

The harvesting of bivalves (*Venus gallina, Ostrea edulis,* Akivades / *Auditapes decussatus*, etc.) is the most important economic activity in the Lagoon. The Lagoon provides favourable conditions for the production of bivalves because of numerous small freshwater streams entering it. Cardak Lagoon is the only area in which *Venus gallina* is produced in Turkey. Carpet shells are exported alive to various EU countries, primarily Italy and Greece. Annual carpet shell production ranges from 40 to 60 tons, which intensifies between November

and February. Fishing, another economic activity in the Lagoon, is performed in the weir on the coast of the spit. The intensive fishing period is April and May during which one ton of fish from each of the species Picarel (*Maena smaris*), Blue Jack mackerel (*Trachurus picturatus*) and Cow bream (*Sarpa salpa*) is caught daily on average. The amount of fish caught outside this period is around 50 kg daily.

A car ferry quay is located immediately to the southeast of the Lagoon. The car ferries operating between Cardak and Gelibolu carry around 1000 vehicles and 2000 passengers per day. Daily recreational activities intensify in the Lagoon and its vicinity in spring and summer. In this period, the Lagoon is quite active in terms of sea tourism, especially at the weekends. There are about 50 tents along the beach on the spit during the summer season.

Bird hunting is a common custom in Canakkale province. The richness of the Lagoon in birds also attracts hunters from other regions. About 100 inhabitants of Cardak alone are estimated to be involved in bird hunting.

The number of buildings in the study area is around 140. Of these buildings, 25 are not used. A dairy enterprise with a purification system is the only industrial facility in the study area.

ORNITHOFAUNAL CHARACTERISTICS

Turkey constitutes one of the most important bird migration routes in the Palearctic region. The richness of bird species has been enumerated by past and recent studies. Around 500 bird species are found in Turkey (Kiziroglu, 1989; Kasparek, 1992; Kilic, 1999; Karakas et al., 2004; Sert et al., 2004; Perktas et al., 2005; Tabur, 2005).

Lagoons are ecosystems with a high level of diversity, especially of bird species. During observations at Cardak Lagoon, bird species especially of the orders Anseriformes, Charadriiformes, and Passeriformes were identified. In total, some 82 bird species from 35 families belonging to 15 orders were observed in the Lagoon. The species in the 15 orders observed in different habitats include Gaviiformes (1 species), Podicipediformes (3 species), Procellariiformes (1 species), Pelecaniformes (3 species), Ciconiiformes (4 species), Phoenicopteriformes (1 species), Anseriformes (9 species), Falconiformes (5 species), Gruiformes (1 species), Charadriiformes (16 species), Columbiformes (2 species), Strigiformes (1 species), Coraciiformes (3 species), Piciformes (1 species), and Passeriformes (31 species).

Out of the 82 species from 35 families were recorded throughout the observation. The abundance of species of the orders Anseriformes (9) and Charadriiformes (16) in particular indicates the importance of the area for avifauna. Some 22 species that are resident throughout the year, approximately 18 summer migrant species, 34 winter migrant species and 8 transit species are found in the Lagoon. Although migratory individuals vary by species in this area, they generally use the Lagoon for feeding, shelter or reproducing for about 3 to 4 months, while others stay in the vicinity for 5 to 6 months.

The bird species arriving in Cardak Lagoon in winter include the Great Crested Grebe *(Podiceps cristatus)*, Little Grebe *(Tachybaptus ruficollis)*, Black-Necked Grebe *(Podiceps nigri-*

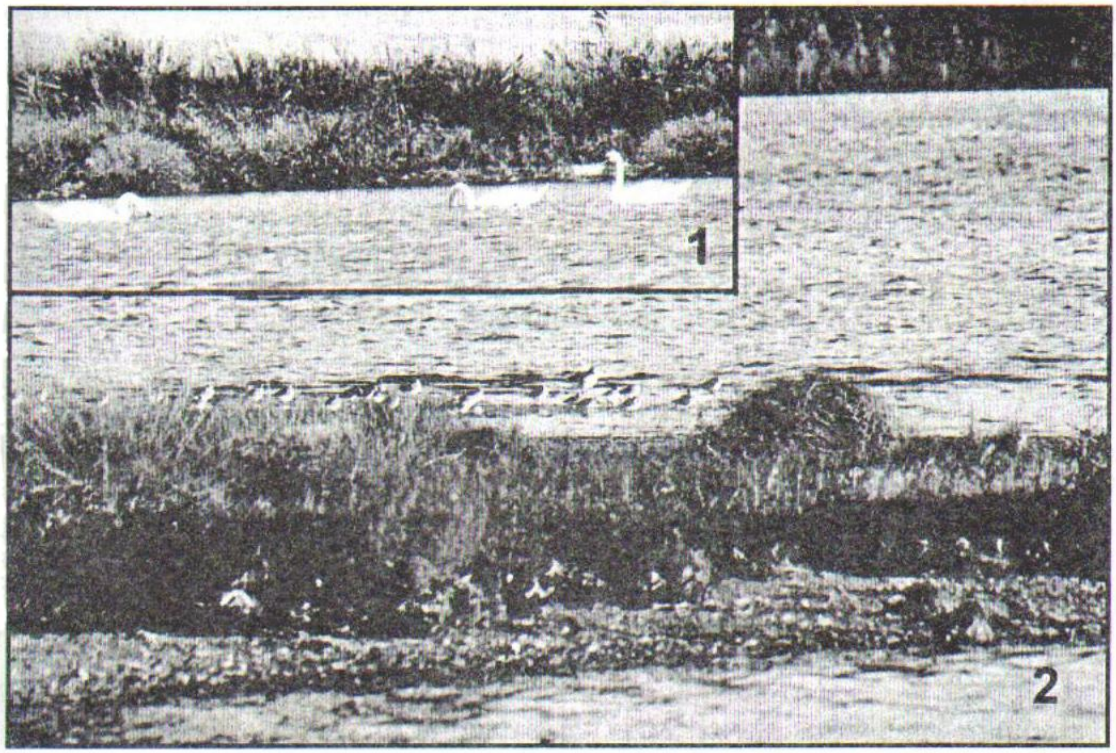

Fig. 2. Examples of bird wealth of Cardak Lagoon: 1. Mute Swans; 2. Various coastal birds (Grey Plover, Little Stint, Dunlin)

collis), Cormorant *(Phalacrocorax carbo)*, Shag *(P. aristotelis)*, Pygmy Cormorant *(P. pygmeus)*, Great White Egret (*Casmerodius albus*), Grey Heron *(Ardea cinerea)*, Greater Flamingo *(Phoenicopterus ruber)*, Mute Swan *(Cygnus olor)*, Mallard *(Anas platyrhynchus)*, Coot *(Fulica atra)*, Oystercatcher *(Haematopus ostralegus)*, Little Ringed Plover *(Charadrius dubius)*, Grey Plover *(Pluvialis squatarola)*, Little Stint *(Calidris minut)*, Dunlin *(Calidris alpina)*, Black-Headed Gull *(Larus ridibundus)*, Black-Headed Gull *(Larus cachinnans)*, Kingfisher *(Alcedo atthis)*, Crested Lark *(Galerida cristata)*, Robin *(Erithacus rubecula)*, Chiffchaff *(Phylloscopus coolybita)*, Great Tit *(Parus major)*, House Sparrow *(Passer domesticus)*, Greenfinch *(Carduelis chloris)*, Goldfinch *(Carduelis carduelis)* and Corn Bunting (*Miliaria calandra*) (**Fig. 2**).

The species arriving in the Lagoon in the summer include the Ruddy Shelduck *(Tadorna ferruginea)*, Black-Winged Stilt *(Himantopus himantopus)*, Curlew (*Numenius arquata*), Mediterranean Gull *(Larus melanocephalus)*, Common Tern *(Sterna hirundo)*, Turtle Dove *(Streptopelia turtur)*, Syrian Woodpecker *(Dendrocopos syriacus)*, House Martin *(Delichon urbica)*, Swallow *(Hirundo rustica)*, Yellow Wagtail *(Motacilla flava)*, Blackbird *(Turdus merula)*, Willow Tit *(Parus montanus)*, Corn Bunting *(Miliaria calandra)* and Black-Headed Bunting *(Emberiza melanocephala)*.

Species reproducing in the Lagoon include the Ruddy Shelduck *(Tadorna ferruginea)*, Black-Winged Stilt *(Himantopus himantopus)*, Mediterranean Gull *(Larus melanocephalus)*, Kentish

Plover *(Charadrius alexandrinus)*, Yellow Wagtail *(Motacilla flava)*, Redshank *(Tringa tetanus)* and European Bee-eater (*Merops apiaster*).

SURVEY RESULTS ON CURRENT TOURISTIC USE OF LAGOON

The mean age of visitors interviewed in the survey was 39.6 and their age interval was 15-71. The mean age of local people interviewed was 45.49 and their age interval was 15-77. The visitors came from nine provinces of Turkey. No foreign tourists were encountered among the visitors. 56 % of visitors were aged 40 and over. The visitors were mostly high school graduates (38 %). In addition, one-fifth of the visitors were university students who preferred the environment for tent camping. All visitors stayed around the Lagoon. The most preferred duration of holiday was from 1 day to 7 days (54 %). Furthermore, about one-fifth of the visitors were found to be spending a holiday in the locality for longer than a month.

The visitors were primarily from Istanbul (62 %) and Canakkale province (18 %). It was determined that 72 % of visitors coming to the Lagoon area for a holiday arrived by car ferry. Therefore, it is understood that the car ferry is an effective means of transportation providing a connection between the locality and tourism.

Accommodation preferences among the visitors varied. Motels and pensions were preferred most (28 %), followed by tents (26 %), a friend's/ relative's house (24 %) and summer houses (22 %), respectively. This distribution is associated with the absence of any hotels around the Lagoon, the limited number of pensions, and the presence of an opportunity for tent camping.

A majority of the visitors had been on holiday at the Lagoon before (80 %). In a sense, this result, which indicates repetition of holiday experience around the Lagoon, reflects visitor satisfaction. In the survey, visitors were asked to evaluate the attitude of the local community towards visitors on a scale with '1' representing 'very bad' and '10' representing 'perfect'. The average of the evalua-tion results was found to be 7.8. Those who gave a score between 1 and 5 constituted only 10 % of the total number of visitors. These results indicate a positive relationship between the host community and visitors.

Part of 22 % of the visitors stated that they chose to go on holiday in this locality since they were interested in bird observation. The general satisfaction of visitors with their holidays, together with the interest of approximately one-fifth of visitors in bird observation, indicates that touristic demand to support ecotourism exists in the locality. Furthermore, the convenience of the Lagoon for tourism is supported by the view of the majority of visitors that the Lagoon and its vicinity possess touristic value (**Table 1**).

The attitudes of local people towards tourism, along with their participation in hunting activities in the Lagoon, were investigated in the survey. According to the results, 21 % of local people were found to be active in bird hunting in the Lagoon. It may also be observed that locals generally responded highly favorably to judgements with respect to tourism (**Table 2**). The fact that members of the local community, who were interviewed, agreed largely with the judgment that the Lagoon should be promoted further reflects a wish to see the development of tourism. Moreover, out of 100 persons, 51 stated that they were

Table 1. Views of visitors on touristic value of Cardak Lagoon and vicinity

Unit	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total responses number
Number of responses	0	6	3	25	15	49
Percentage	0	12.2	6.1	51.1	30.6	100

Table 2. Views of local community on utilization of Cardak Lagoon and vicinity for tourism

Evaluation	Unit	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Responses (%)
Lagoon and its vicinity feature a touristic value	%	5	8	8	33	46	100
Lagoon should be further promoted in terms of tourism	%	3	3	6	11	77	100

willing to use their own house as a pension in the event of sufficient touristic demand. This indicates a local profile that is convenient for the development of home pension operating.

Cardak Lagoon features natural sand dunes of high landscape value and a suitable medium for nature walks. The surroundings of the Lagoon have potential value for swimming, sportive hand-line fishing, bird observation, and nature tourism. Above all, the Lagoon is extremely favorable for bird observation owing to its richness in bird species and populations. Moreover, Cardak Lagoon is an area with an existing touristic demand among other wetlands in Canakkale province (Kavak Delta, Gokceada-Imbros Island, Suvla Lagoon, Umurbey Lagoon, Kumkale Reed Bed and Araplar Gorge). In addition, the nearest other places, where ornithotourism takes place in western Turkey, namely, Manyas Bird Lake and Gediz Delta-Izmir, are located a considerable distance from the Lagoon at 140 and 350 km, respectively. It might therefore be estimated that there is a demand for bird observation activities in the Lagoon, especially at weekends, primarily from Canakkale itself and big cities such as Istanbul. Indeed, today the majority of visitors coming to Cardak for a holiday are from Istanbul, the largest and most densely-populated city in Turkey. The surroundings of the Lagoon are preferred most by those who wish to avoid crowds and are in search of tranquility. According to the generally-accepted relationship between recreational activity and distance, locations at a distance of 70-80 km are visited as half-day or one-

day trips, while persons undertaking journeys up to 400 km consider the destination as suitable for weekend trips (O z g u c, 2003). It should also be mentioned that, located at a distance of only 35 km from Cardak at the neck of the Gallipoli Peninsula on the opposite side of the Dardanelles, the Kavak Delta has been declared an Important Bird Area (IBA) of international quality in terms of bird species and population (O z c a n et al., 2009) and complements Cardak Lagoon's potential for ecotourism, since it is a favorable alternative for bird observation.

Numerous natural, historical and cultural attractions in Canakkale province contribute to Cardak Lagoon's potential for ecotourism. The presence of national parks occupies a special place among the touristic attractions of the locality. Among them, Mount Ida National Park is a must-see for fanciers of nature. Furthermore, Cardak and Gallipoli are reciprocally located on the Dardanelles Strait. The Historical National Park on the Gallipoli peninsula and the Troia National Park only 72 km from Cardak enrich the ecotourism potential of the Lagoon. Traditional events in the locality are attractive to tourists too, including the annual Cardak Fair and the Cardak Oil Wrestling Contest, which has been held every August for nearly 300 years.

Among environmental considerations, weather and climate play a significant role in the occurrence of recreation and tourism. Climatic conditions allow or favor certain outdoor touristic or recreational activities. Therefore, climate influences what and when touristic activities can be carried out and plays a decisive role in the selection of destinations (P e r r y, 1997; G o m e z, 2005). The climatic features of Cardak offer quite favorable conditions for tourism. Cengiz et al. (2008) evaluated the climatic comfort features of Canakkale province in terms of tourism using the method of Mieczkowski. Spring and autumn, which are most suitable for bird observation, are also favorable for climatic touristic comfort according to the Tourism Climate Index (TCI) rating system; where only November is included in the *good* category, while the other eleven months are included in the *very good* category (C e n g i z et al., 2008).

Seasonality is one of the most serious problems in tourism. Fluctuations in visitors and revenues are viewed as a problem by the tourism industry, which spends considerable time, money, and effort to modify these patterns through the development and implementation of strategies designed to extend the "shoulder seasons", or to create "all season" destinations (H i g h a m et al., 2008). Ecotourism activities based on bird observation will help extend the tourism season in this locality, which is currently limited to the summer months.

Although ecotourism is a type of tourism aimed at drawing visitors to areas far from the great population masses, an increase in demand brings about the requirement for tourism-related housing in the form of accommodation facilities. This housing, regarded as the first sign of degradation of the environment, may damage the local habitat. Furthermore, tourists themselves may frighten birds and other animals away (O z g u c, 2003). Therefore, the problem of accommodation should be solved by supporting home pensions rather than by the construction of additional housing. The participants in ecotourism tours are generally part of small groups. The accommodation units at ecotourism

centers are overwhelmingly units with a capacity of no more than 100 beds. The fact that accommodation facilities in Cardak are on small scale and are mostly in the form of home pension operations supports the potential for ecotourism.

Economic benefits play an important role in tourism in protected areas because of the direct or indirect relationship between local residents and biodiversity conservation. Moreover, such benefits can lead to local residents voluntarily abstaining from activities that are harmful to biodiversity and natural resources or to a shift towards biodiversity-friendly activities (X u et al., 2009). The results of this study also show that the local community is willing to see the development of tourism in the Cardak Lagoon, particularly for economic reasons. The development of opportunities for ecotourism around the Lagoon will enhance the ecological consciousness of the local community and its desire for conservation, thereby reducing bird hunting.

CONCLUSION

The Cardak Lagoon area is directly influenced by the surrounding economic and recreational activities. Some activities exert enormous pressure on the natural habitats of birds. The most serious of these problems is illegal bird hunting in the Lagoon. Moreover, since the Lagoon and sand spit are easily degradable natural features, they lack a high visitor-carrying capacity. Uncontrolled use of the Lagoon has led to further problems, such as the transfer of wastes into two pits (cesspools) nearby, noise, and movement of motor vehicles on the spit. It is therefore imperative that greater control over use of the land under consideration be established. A harmonious relationship and interaction between human beings and nature are important for the sustainability of the Lagoon and its environmental quality. Thus, the materialization of ecotourism based on bird diversity in Cardak Lagoon will contribute significantly to the conservation of the Lagoon.

The results obtained in this study can be summarized as follows.

- Cardak Lagoon is an ideal medium for scientific studies, nature training, and development of environmental consciousness. The accommodation facility run by the municipality in the locality is suitable for setting up a Nature School and Bird Observation Training Center. This might also be used for educational activities on the unique features of lagoons (ecological, botanical, etc.) in the future. Furthermore, educational programs appropriate for students of all ages and also the local community will help establish an infrastructure that will initiate ecotourism in the locality.
- In addition to the biological riches of the natural environment, ecotourists are interested in traditional cultural attractions. Due to its location, the Lagoon features favorable land and sea transportation as well as important natural, historical and cultural attractions nearby. Due to these features, it can easily attract a broad spectrum of visitors.
- The existing relationship of the locality with tourism and the suitability of its current visitor profile will facilitate an orientation towards ecotourism based on bird observation.
- Ecotourism, above all, requires a carefully-preserved and high-quality natural environment. As well as the conservation of the Lagoon owing to its status as a natural site, the absence of polluting activities such as industry

and mining in the surrounding area offers a convenient medium for ecotourism.

• Cardak Lagoon, one of several favorable places for bird observation in Turkey, offers good potential and adequate conditions for a transition to ecotourism. However, the present "natural site" conservation status of the area remains insufficient to prevent inappropriate usage of the Lagoon. In addition, it is suggested that the Lagoon should be declared "Cardak Bird Paradise" by being granted the status of Nature Park. This status is reserved for those natural lands in Turkey that feature important vegetation and wildlife and that are suitable for rest and relaxation in harmony with natural scenery. Ecotourism developed within the framework of this status will not only contribute to the preservation of the biodiversity of the Lagoon, but also support the welfare of the local community.

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