Environ Monit Assess (2016) 188: 52
DOI 10.1007/s10661-015-5064-7

Evaluating the recreation potential of Ilgaz Mountain National Park in Turkey

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Received: 2 July 2015 / Accepted: 16 December 2015 / Published online: 22 December 2015
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Abstract In recent years, natural areas have become a preferred recreation area for people looking to escape their busy urban lives. The world has become so complicated that people now seek solace in areas of nature. Recreational activities conducted in natural areas, such as Ilgaz Mountain National Park, should be respectful of the environment to ensure balance and no negative environmental impact. This balance should safeguard environmental protection and only be used with the right to establish recreation planning. National parks are protected areas where the most beautiful wonders of nature exist. Thus, urban planning for recreation, and demand for recreation areas, must demonstrate both the potential of recreation resources and the protection of Ilgaz Mountain National Park. Urban open and green spaces have an important function, and in this study, it has been looked at Ilgaz Mountain National Park to examine the current situation. The aim of this study is to ensure the sustainability of natural and cultural resources via an evaluation to reveal the necessary practices and precautions regarding the area's recreational potential. As a result, Ilgaz Mountain National Park's recreation potential was found to be 72 %, and thus, it is considered to be an area of high recreation potential.

Keywords Environmental sensitivity · National park · Protected area · Recreational potential · Recreational opportunity · Scenic attractiveness · GIS analysis

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Introduction

As it has been entered a period of rapid urban development, the loss of open and green spaces in urban areas has resulted in various negative effects. Scientific, industrial, and technological fields have revealed numerous negative aspects stemming from unplanned urbanization, including poor physical and psychological health and socio-cultural problems. Densely populated urban areas are the only residential areas available, and it is here that people are being forced to live (Okelloa and Yerian 2009; Maple et al. 2010; Duzgunes and Demirel 2013; Calik and Sertbas 2014; Cheung and Jim 2014).

Unplanned developments in industrial and technological areas with unhealthy urbanization and monotonous daily life aggravate the mental and physical deterioration of one's daily living environment. Efforts are now being made to meet people's physical, mental, social, cultural, economic, and physiological needs via leisure facilities and recreation areas, and they are turning to natural areas to regain balance and health. Therefore, for people living in cities, it is important to meet their environmental needs and to ensure that urban

recreation areas are available (Goonan 2009; Geneletti and Dawa 2009; D'Antonio 2010; Monz et al. 2010; Ngoka 2013; Barros et al. 2013; Cetin 2015a). The escape from daily pressures is reflected in the recreational potential of an area, and recreation in natural environments is the preferred location within the classic understanding of *recreation*, especially that in natural parks. While this increases the demand for change and development, in protected areas, it comes with the danger of excessive use. Therefore, protected natural areas should fall under a conservation management plan. This is even more important where the area is considered a national attraction, garnering much use. Recreation and tourism services must be assessed regarding protection according to the land use planning and natural endowments. This basic approach to planning without the consumption of natural resources ensures the rational use of natural assets (Kliskey 2000; Cengiz 2007; Brown and Weber 2011; Zhang et al. 2012; Tomczyk 2011; Kim and Daigle 2012; D'Antonio et al. 2013; Cetin 2015b).

Ilgaz Mountain National Park is rich in potential in terms of natural, historical, and socio-cultural value. While it is common to have such areas, it has become necessary to adopt a holistic understanding of recreational potential to preserve the cultural and recreational value while also realizing benefits from tourism. Local people and domestic and foreign tourists all want to enjoy and seek out potential recreation areas. The organization of recreation potential as a sustainable environmental action tool is emerging as a systematic and environmentally sensitive approach to recreational planning.

To determine the application of recreation potential for this purpose, we conducted an evaluation of Ilgaz Mountain National Park, and based on the result, we present various recommendations to resolve current and potential problems.

Materials and methods

The study area covers Ilgaz Mountain National Park in the Western Black Sea region of Turkey. The park has vegetation, wildlife, and a geographical location and a micro-macro scale that offer a different perspective in terms of natural landscape value, which has great importance. The park is 33° 42′ 12″ and 33° 45′ 39″ east longitude and 41° 02′ 55″ and 41° 05′ 17″ and is located between the northern latitudes. The location of the research is given in Fig. 1 (Kastamonu 2015).

For this study, we looked at domestic and foreign studies, and particularly that conducted by the city of Kastamonu, which conducted research concerning an urban design project—its annual report provides relevant statistics and inventory. AutoCAD software was used to create layout plans in the scale of 1/25,000 and 1/10,000, and the city has benefited from the implementation of the plan and zoning plan (NP 2015; TC 2015; Kastamonu 2015). In this area of research, survey work and surroundings, landscape value, climate value, accessibility, recreational facilities, and other features are commonly determined by visual analysis studies. For example, Gulez (1990) states that the "determination of outdoor recreation potential," based on an assessment methodology. A method aimed at identifying the potential for outdoor recreation with mathematical formulas is explained as follows:

$$L + C + A + \mathrm{RF} + \mathrm{NF} = \mathrm{RP} \quad (1)$$

L	Landscape value
C	Climate value
A	Accessibility
RF	Recreational facility
NF	Negative factors
RP	Recreation potential (%)

Landscape value (L), which is the most important feature in the assessment of an area for recreation potential, is the landscape potential of an area (Cetin 2015c). Landscape value is assigned a maximum of 35 % of the total recreation potential value.

Climate value (C), which considers that a climate has a very large impact on recreational activities, represents a maximum of 25 % of an area's potential (Kaya et al. 2009; Topay 2013; Cetin 2015d). Climate looks at "temperature," "rain," "sun," and "windiness" (Gulez 1990). Accordingly, climate value is determined as follows:

$$\begin{aligned}\text{climate value } (25) = {} & \text{temperature } (10) \\ & + \text{precipation } (8) + \text{sun } (5) \\ & + \text{windiness } (2)\end{aligned}$$

Accessibility (A) concerns the degree of accessibility of an area of recreation potential. Therefore, the

Fig. 1 Study area

evaluation method assigns this factor a maximum value of 20 %.

Recreational facility (RF) is the detection of recreation potential, where all existing recreational facilities make a positive impact by increasing the recreational potential. In this case, recreational facilities can represent a maximum of 20 % of the final score (Chhetri and Arrowsmith 2008; Kaya and Aytekin 2009; Topay and Memluk 2011).

Negative factors (NF), in determining an area of recreation potential, consider that an area's existing negative factors must be accounted for. Negative factors are given negative scores (−) and thus reduce the total score.

Results obtained using this method are explained as follows: a final score of 30 % for recreation potential (RP) is very low, 30–45 % is a low potential for recreation, a recreation potential of 46–60 % is medium-level potential, and 61–75 % is a high potential for recreation; a recreational potential of 61–75 % was obtained in five categories. Points should be awarded for elements, and each element in the formula is explained in Table 1.

Results and discussion

Ilgaz Mountain National Park covers a total of 1088.61 ha and lies within the boundaries of both Kastamonu (750.86 ha) and Cankiri (337.75 ha) (Fig. 2). The park holds an important position, regionally and nationally, in terms of cultural value and recreational resources. Dominated by coniferous trees, the park enjoys significant forest cover, with Scots pine and

Table 1 Evaluation of the recreation potential of Kastamonu Ilgaz Mountain National Park

Values	Properties	Explain	Point	Assessment point
Landscape value (*L*)	Size of area	>10 ha	4	4
		5–10 ha	3	
		1–5 ha	2	
		0.5–1 ha	1	
	Surface condition	Plain	5	3
		Less wave	4	
		Less prone	3	
		Less bumpy	2	
		Medium rough	1	
	Flora	Greenwood, brushwood, meadowland	7–8	5
		Lonely greenwood, meadowland	6–7	
		Brushwood, meadowland	5–6	
		Meadowland, sparsely greenwood	4–5	
		Only brushwood, meadowland	3–4	
		Brushwood, sparsely woodland	3–4	
		Meadowland, sparsely brushwood	2–3	
		Only meadowland	1–3	
	Seas, lakes, streams	Sea cost	7–8	4
		Shores of lake	6–7	
		Shores of stream	4–5	
		Creeks	1–4	
	Visual quality	Panoramic views	3–4	3
		Beautiful views	2–3	
		Visual and aesthetic value	1–4	
	Other properties	Caves, waterfall, historical and cultural textures	1–6	6
Total				25
Climate value (°C)	Temperature	Summer months average (°C)		8
		16-17-18-19-20-21-22-23-24-25	1–10	
		34-33-32-31-30-29-28-27-26-25	1–10	
	Precipitation	Total summer precipitation (mm)	1–8	8
		50-100-150-200-250-300-350-400		
	Sunshine	Summer months average of cloudiness		5
		0–2, 2–4, 4–6, 6–8, 8–9	1–5	
	Windiness	Average wind speed in summer months		1
		<1 m/s	2	
		1–3 m/s	1	
Total				22
Accessible (*A*)	The region's touristic importance	Mediterranean, Aegean, Marmara, Black Sea cost	3–4	4
		Important highway	2–3	
		Prior regions in tourism	1–3	
	Having a city with min. 100,000 of population in the area	Up to 20 km	4–5	5
		Up to 50 km	3–4	
		Up to 100 km	2–3	
		Up to 200 km	1–2	
	Reaching time from the least 5000 populated area	Up to 1-h walking distance	4	4
		0–0.5 h by vehicle	3	

Table 1 (continued)

Values	Properties	Explain	Point	Assessment point
		0.5–1 h by vehicle	2	
		1–2 h by vehicle	1	
	Transportation except taxi and private car	Walking distance	3–4	3
		Vehicle availability	2–3	
		Vehicle availability at specific hours	1–3	
	Convenience of transportation	Cableway, railway, ferryboats, balloon, airplane, parachute, etc.	1–3	2
Total				18
Recreational facility (RF)	Picnic facilities	Picnic table, grill, etc.	1–4	1
	Water condition	Drinking and water use facilities	1–3	3
	Overnight facilities	Fixed overnight facilities	2	2
		Camp with/without tents	1–2	
	Toilets	According to their qualifications	1–2	1
	Parking areas	According to their qualifications	1–2	1
	Casino, buffet, etc.	According to their qualifications	1–2	1
	Guard and workers	Permanent assistant	2	2
		Assistant on weekends	1	
	Other facilities	Beaches, sports facilities, etc.	1–3	2
Total				13
Negative factors (NF)	Air pollution	According to their degree of pollution	−1 (−3)	−1
	Insecurity	According to the security degree	−1 (−2)	−1
	Water pollution	For seas, lakes, and streams	−1	−1
	Neglected	Not enough maintenance in the area	−1	−1
	Noise	Traffic, crowd, etc.	−1	−1
	Other adverse factors	Mine, stone and gravel quarries, constructional remains, etc.	−1 (−2)	−1
Total				−6
Outdoor recreation potential (RF) (%)				72

fir trees being common species. Thrush may also appear in public areas, and wild animals such as wolves, foxes, deer, roe deer, lynx, and wild boar can be seen in forested areas (NP 2015; TC 2015; Kastamonu 2015)

Because of its unique landscape value, rich vegetation, and wildlife, the Ilgaz Mountains were declared a national park on June 2, 1976. The mountain location is shown on a map of Turkey in Fig. 1, and topographic maps are shown in Fig. 3. The Ilgaz Mountains' terrain consists mostly of serpentine, schist, and volcanic rock. The geological structure of the area offers interesting mountain formations, and various geomorphological movements can be seen in the ridges and peaks. The geomorphological structures of mountains create an extraordinary natural landscape combined with lush forests.

The Ilgaz Mountains are noted for their natural, cultural, and archaeological values. Such floristic regions have specific climatic advantages and enable the endemic growth of plant species. Kastamonu is a province benefiting from both land and air transports, and the mountain range is on the Ankara–Cankiri highway. From Kastamonu, it is an approximately 25-km drive to the Ilgaz Mountains. The mountains are situated in a transition zone between the Black Sea climate and the terrestrial climate of Central Anatolia. The transition zone provides the mountains with a rich diversity of species and habitats (NP 2015; TC 2015).

The Ilgaz Mountains support national parks, topography, rich forests and vegetation, high wildlife potential, unique natural beauty, rich recreational resources, and winter tourism facilities and therefore indicate that it

Fig. 2 Location of Ilgaz Mountain National Park in Kastamonu and Cankiri provinces

has potential as a recreation area for health tourism. Because of the transition area between the inner regions and areas, there is a wealth of habitats. The national park has geomorphological and geological features, a variety of plants and forests, interesting sights, and many recreational facilities that offer clean air, winter sports, and tourism facilities.

The average annual temperature is 9.8 °C in the national park. The average high for July is 19.7 °C, and in August, it is 20 °C. January is the coldest month at −0.8 °C. The average annual precipitation is 65 mm in Kastamonu, which is 110 mm lower than in the national park, with mountain peaks at 1200 mm. The maximum precipitation in spring and early summer (as a feature of a continental mountain climate) is heavy; the North Slope experiences significant rainfall. Furthermore, snow on the summit measures up to 1 m thick for 6 months of the year (NP 2015; TC 2015; Kastamonu 2015).

In the Ilgaz Mountains, the Euro–Siberian region offers great flora as does the region Oxy. Uludag fir and pines dominate the forests in this region. Within the national park forest, 617 taxa of shrubs and grasses have been identified. Floristic research conducted in the national park identified 51 families with 234 species, and sub-species-level taxa have been identified. Of these 37 species in Turkey (representing 15.8 % of endemics), 4 are endemic to the Ilgaz Mountains (*Ornithogalum wiedemannii*, *Corydalis wendelboi*, *Arabis abietina*, and *Barbarea trichopoda*; the latter two are gravely *endangered*).

The southern side of the mountains gets more rain and is damp. Larch is seen on the southern slope. Generally, up to a height of 2000–2200 m, coniferous tree species are common. At the upper limit of the forest, alpine plants can also be seen. On the northern slope, broad-leaved oak and beech are evident. Pine and fir dominate the higher sites. Common animal species in the forest include brown bear, red deer, roe deer, wolves, lynx, fox, wild boar, dwarf bats, hares, Caucasian squirrel, falcon, and lesser spotted eagles.

Activities in the area include mountain walks, botanical tours, hiking, mountain climbing, mountain walking, cycling, jogging, bird, insect and animal observation, and picnicking. One key activity in the tourism potential of the national park area is skiing. There are two ski slopes in the national park. One ski slope is 800 m long and the other 1500 m. The park also offers the opportunity for wildlife photography. There are many wild animals, birds, and plant species in the area; thus, Ilgaz Mountain National Park is Turkey's most important plant and bird area. The scenery in the different seasons, especially autumn, attracts many photographers.

The study area also includes areas for picnic activity. This is important in terms of proximity and accessibility to the city center. The research area includes a topographic area because of landscape value and trekking areas. All of these areas are important to camping and trekking and are helpful to people in the field. The Ilgaz Mountains' views have value because the topography of the area enables many nature walks.

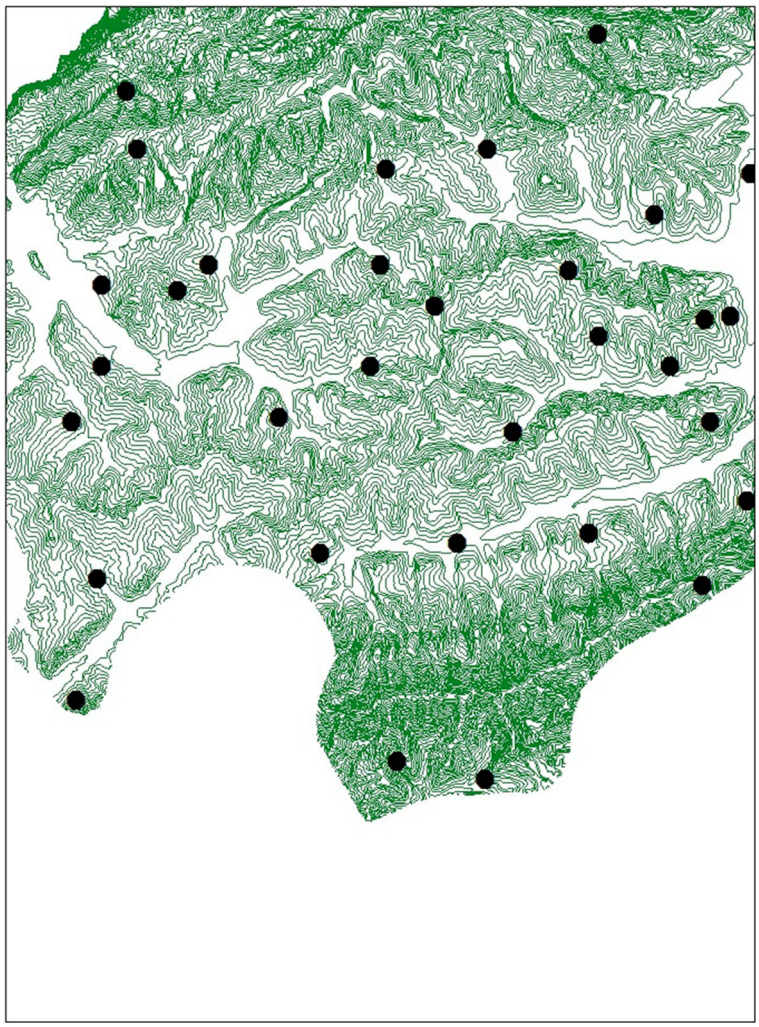

Fig. 3 Topographic map of Ilgaz Mountain National Park

The national park offers forested lands, clearings, accommodation, and recreational facilities, and a river forms a border with the ski slopes. Research shows that the park's geographical, ecological, and socio-cultural aspects of ecotourism resources have significant value, and assessments cover the scope of ecotourism, including bird watching, transhumance, horseback riding, caving, wildlife tours, and adventure and sports tours. The identified potential for history tours and photography is shown in Fig. 4.

There are numerous hiking tracks and camping areas even though these are officially outside the research area. By installing lines for climbing and rock climbing, it would be possible to implement such activities. The highest peak has an altitude of 2587 m. There is also fishing in Kirkpinar Plateau Lake in the park.

Based on the information contained in the above evaluation, the evaluation results for Ilgaz Mountain National Park regarding recreation potential are presented in Table 1. The national park offers education, scientific research, and recreation, providing many versatile formats. The region largely caters for ski tourism in the winter. However, recent summer visitors have also been interested in ecotourism and global climate change has warmed the northern hemisphere summer. As a result of the evaluation, Table 1 shows the recreation potential to be 72 %, and thus, the recreational potential of the area is considered "high."

Conclusions

A dynamic relation exists among national parks, water, air, plants, soil, animals, and humans. Furthermore, the various biological, hydrological, ecological, and

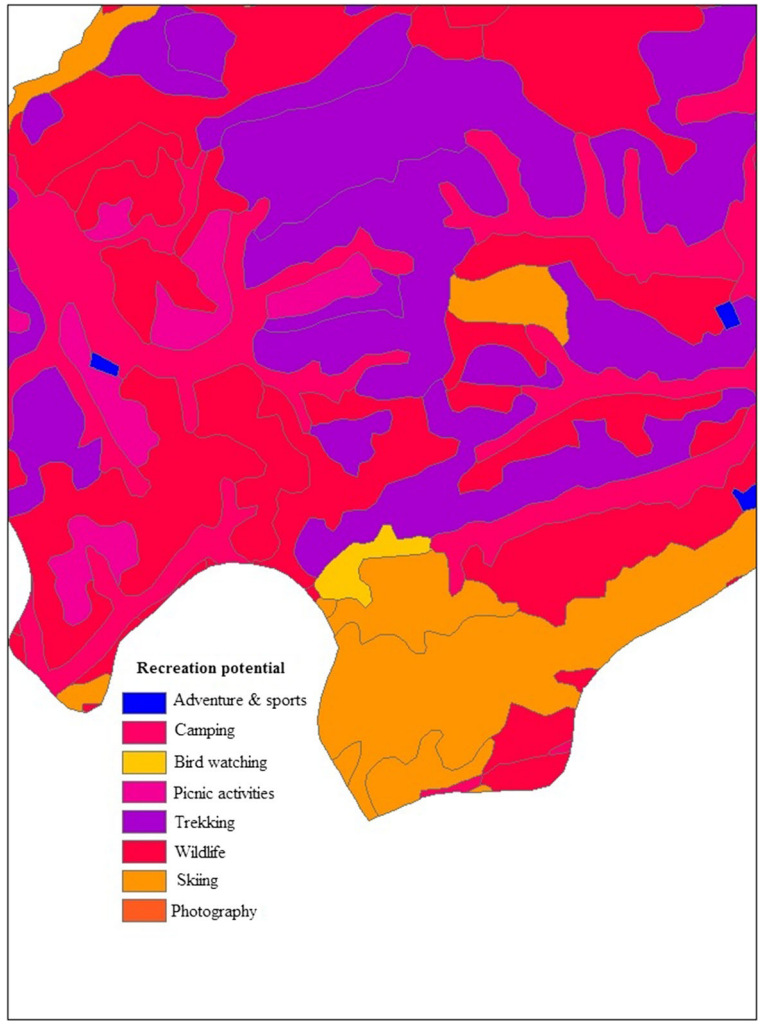

Fig. 4 Current recreation and tourism activities in Ilgaz Mountain National Park

climatic changes throughout history and the physiological and aesthetic properties that form a focal point of every period now hold greater social significance.

Nature parks, with their rich natural and cultural features, provide areas of biological and psychological regeneration for all living things. Therefore, such parks are important recreation areas that require appropriate planning. An area's past recreation function and other functions can shape how it is used in the future.

Natural parks have a high recreation potential. However, the natural structure coupled with poor planning rather than holistic planning can result in environmental issues that are distorted by daily planning and have an increasingly negative impact on the ecosystem.

This study determined the results of an evaluation process but, with high recreation practices by users in potential areas of recreation, can lead to a lack of diversity and activity that hampers efficient use. Therefore, eight recommendations are provided below for improvements in the area:

- A natural park possesses the important features of natural and aesthetic beauty. However, a balance must be reached. For example, parking arrangements are as important as the protection of natural and cultural properties. They add to active recreational activities that will provide individual enjoyment and spatial identity. In this manner, the potential of the existing recreation area is increased and will provide the expected services.
- Ensure the continuing protection of the ecological balance.
- Where space constitutes the main source of value, the Ilgaz Mountains also provide ecological,

biological, geological, geomorphological, landscape, and cultural resources and value, so we must ensure the continuity of these values.
- Development of an appropriate mechanism to ensure the value of ecotourism activities and resource balance between protection and use.
- Necessary precautions must be taken to reduce/prevent air, soil, water, and noise pollution.
- The protection of natural habitats and species and provisions for the continuity of technical and administrative measures.
- Educating locals and visitors about protected areas, ensuring the awareness of local people, which also includes the support of local and regional economies.
- Maintain existing buildings but avoid the construction of new ones, as this could disturb the natural and aesthetic design. In terms of the rational use of natural resources, the development of an infrastructure and superstructure for existing recreational areas should be considered.

A recreation and management model for the Ilgaz Mountain Natural Park must take the above recommendations into account. It should include principles and testing methods that govern the park's protection and use.

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