International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Biotopes in the Ganos (Işıklar) Mountain and Near Surrounding Areas

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Abstract

In our day, with the increase of industrialization, the tendency towards natural resources has accelerated. This causes an increase in environmental pressure groups on the ecosystems. The increase in the demand for biological resources, lack of awareness of the global impact of biodiversity at the local level, and inadequate government policies regarding the protection of biological resources lead to loss in terms of biodiversity. Biological and ecological diversity are threatened especially due to inaccurate and intensive land use. For this reason, the importance of habitat protection is increasing, and potential ways to support environmental conservation efforts are being explored throughout the world. For landscape ecology and sustainability, a more effective and sustainable understanding of the use of space should be developed by demonstrating the current state of natural resources. In ecological planning, biotope mapping is a very important study to refer for taking decisions about conservation-utilization. With the biotope mapping, living environments and important habitats of plant and animal species are determined, the sensitivity status of each habitat is determined, thus, decisions regarding protection and utilization of biotopes can be taken according to their sensitivities. In this study, biotopes of Ganos Mountain and its immediate surroundings have been mapped. Within the scope of the study, selective and representative mapping methods have been used for biotope mapping.

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In this context, existing studies on the research topic and area have been collected and evaluated, and once the area has been determined and identified according to the land use types, the biotopes that are important in terms of conservation and the ones that may represent the entire area enabling generalization are checked, and floristic studies have been initiated in those areas. As a result of analyses, the potentials of the mapped biotopes have been identified and the areas under threat of deterioration have been identified and proposals have been developed to ensure the continuity of the ecosystem in these areas.

Keywords: Biotope; Biodiversity; Ganos Mountain; Işıklar Mountain; Tekirdağ.

1. Introduction

Turkey has huge biological potentialities due to its ecological variations. It is the cross section of Mediterranean, Euro-Siberian and Irano-Turanian floristic regions. Potential for natural resources has not been taking into consideration since the planning for land use has not been worked out on regional or country wide in Turkey. Consequently, ecological balance between public demands and natural potential could not be established for years [1].

Environmental pressure groups are growing in the developing world. Habitat protection is therefore increasing and potential ways to support environmental conservation efforts in the world are being explored [2]. According to the Convention on Biological Diversity signed on 14 June 1992 at the United Nations Conference on Environment and Development (Rio Conference), sustainable use has come into prominence at global scale as a mechanism to ensure its long-term sustainability without diminishing biodiversity. Projects have been carried out on a global scale in order to realize ecological sustainability which is the basis of sustainable development. These projects do not only have the understanding of preserving and managing abiotic resources, but also have a significant place in the conservation and management of species, ecosystems and ecological processes [3].

Environmental and ecosystem planning is a theory that emerged in the 1960s. The plan undertakes the task of maintaining and repairing natural ecosystems and ensuring human activities to be compatible with basis of the ecosystem. Recently, environmental and ecosystem plans have provided insight into urban management planning. These plans include the maintenance and repair of the natural circulation system, the conservation and management of habitats and landscapes and the use of green spaces and other areas [4]. Nature and landscape, the fertility and features of the nature, the ability to use natural resources and flora and fauna must be planned enabling people safely rest in nature [5].

Vegetation and ecological classification are required for extensive assessment of ecosystem health and sustainability of endangered habitats and natural life [6]. Field planning made based on ecological data sets effect the determination of the interactions of available field uses on landscape and consequently, the ecological criteria for the use of space.

Spatial plans should be made considering the effects of the changes in urban use on biotope structures in order to maintain the continuity of the flora and fauna characteristics and to enable a functioning ecosystem. In spatial planning, it is proposed to work with biotopes as a conceptual model integrating biodiversity as biotope levels

reveal the changes caused by the space use first. Besides, biotopes can be easily handled in planning as they are areas that can be represented in mapping and the borders of which can be demarked. This allows to integrate spatial planning with the spatial content of biodiversity and to understand the impacts of the changes led by space use on biodiversity [7]. With biotope maps, the geographical distribution of vegetation types and relationship between this distribution and one or more characteristics of the environment can be eplained [8]. The former landscapes can be explained and information about past and present ecology of the area can be provided through the existing plants in the area [9]. Thus, the factors that biotopes are exposed to and the severity of these factors are explained and the threats they come up against can be determined.

Biotopes of the Ganos Mountain and its immediate surroundings are mapped in this study. It is thus aimed to reveal the changes that space uses have caused in biotope structure during planning, in order to ensure the continuity of flora and fauna and the functionality of ecosystems. The study contributed to the enhancement of knowledge on biodiversity and the development of biotope mapping methods to create a harmonious relationship between biodiversity and human beings. Furthermore, the potential of the area has been revealed with the search of biotopes. When research results are used by planning authorities, it will contribute to the reduction or prevention of environmental pressure and provide economic and ecological benefits in terms of resource utilization.

2. Material and Method

The material of the study is the biotopes and the vegetation of these biotopes in the Tekirdağ part of the Ganos Mountain. The Ganos Mountain, extending in the northeast-southwest direction, are located between 27º 00'-27º 30 'eastern meridians and 40º 30'- 41º 00' northern parallels [10]. The study area which is surrounded by Selçuk, Kınıklar, Akçahalil, and Ahmetçe villages in the north, is at an altitude of 945 m and the lowest sections are flatlands in the east and south which end with the Marmara Sea (Figure 1).

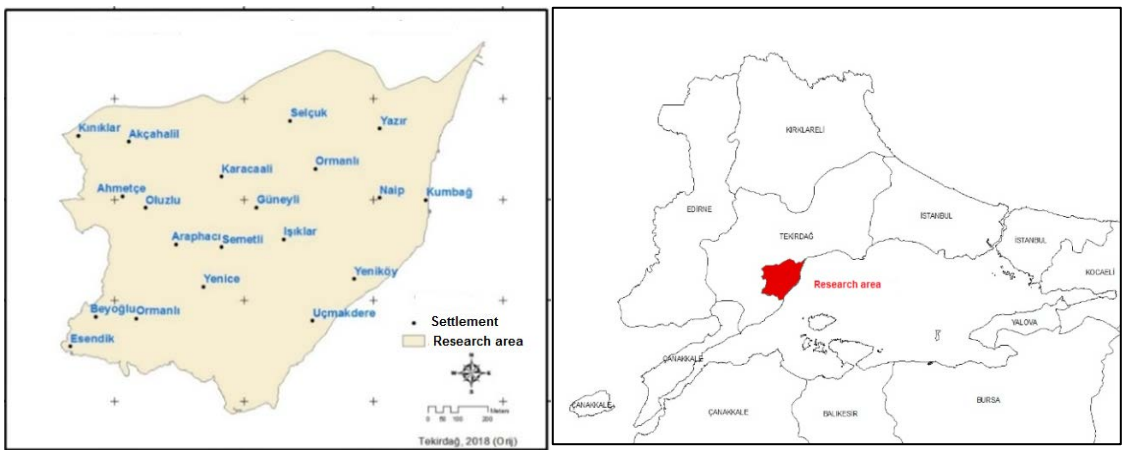

Figure 1: Research area and position in the region.

The Ganos Mountain constitute the upper parts of the Southern Thrace nummulitic zone and the mainland constitutes of Eocene-Oligocene flysch formations [11]. The most extensive stack in the area is the Danişmen

Formation and Quaternary alluviums, which occur due to the intercalation of claystone, sandstone and siltstone of Middle-Upper Oligocene [12]. In the study area, three different types of soil were identified; brown forest soil, non-calcareous brown soil and alluvial soil. The main soil type of the zone is brown forest soil.

The average precipitation is 598.3 mm, the average minimum temperature is 1.8 ºC, and the average maximum temperature is 28.1ºC and the Mediterranean climate is found in the area [13]. This causes the intensive existence of Mediterranean-based taxa. When the existing natural vegetation of the study area is examined, it is observed that it had its present appearance based on factors such as soil, geology and climate. Dry and semi-moist forests consisting of taxa such as oak, hornbeam and linden are found in the upland area, while maquis vegetation occupies a large place on the coastline due to the temperate effect of the sea. There are garigs on the inside of the skirts of Mount Ganos. Here, *Morina persica* L. and *Digitalis lanata* Ehrh. it grows in separate groups and widely [14]. Garig (phrygana) is a second formation that covers arid hills, non-culturally unstable areas, rocky and rocky areas. Plants in this formation are generally low-leafed, low-profile, mostly thorny and/or frequent hairy and with these properties they can easily adapt to arid environments [15]. According to [11]; as a result of the researches of the Ganos Mountain, 202 genera and 64 families, 305 plant taxa were determined. *Asteraceae* families in terms of richness of species are the most important. This is followed by *Fabaceae* family. Research conducted by [14] and supports this information [16].

The research consists of 3 stages. At the first stage, written and visual materials related to the natural and cultural structure of the study area were obtained and examined in order to reveal the physiological and ecological characteristics of the area. At this stage, a digital map of forest management which reveals the natural structure of the area is taken as basis. Additionally, other resources used are; large land groups, geology, land use ability classes and digital maps showing the erosion status of the area. Mapping studies have been started following the determination of the types of biotopes in the area. Selective and representative mapping methods of biotope mapping were used within the scope of the study. Selective mapping is mapping of important biotopes in terms of conservation whereas representative mapping is mapping of areas with the same characteristics according to certain categories or areas with the same area use types [17;18]. Biotopes has been identified and started to be checked in the field. In this context, land studies were carried out in the sample areas during the vegetation period between 2015 and 2017. During the field studies, the field study form was filled for each sample area. The form aims to provide information on habitat type, geological and soil structure, vegetation characteristics and anthropogenic effects. Magellan GPS and WGS 1984 35 N coordinate systems were used while the control points were being taken during the field studies and ArcGIS 10.1 Geographic Information Systems software was used for digital maps. During the field study, plant samples were collected from biotopes for diagnostic purposes and these plants were dried and stored in accordance with herbarium standards and conditions. At the end of the study, potential mapped biotopes were identified and areas under threat of deterioration were identified and proposals were made to ensure the continuity of the ecosystem in these areas.

3. Results

The main types of biotopes in the area were identified through the interpretation of the maps and literature

review of the Ganos Mountain and its immediate surrounding. The biotopes determined within this scope are;

- Wetland biotopes,
- Meadow biotopes,
- Shrub biotopes,
- Coniferous forest biotopes,
- Broad-leaved forest biotopes.

Following the classification of the living environments, biotopes were checked in the field and their floristic compositions were determined. In this context, field studies were carried out in 63 biotope fields (Figure 2).

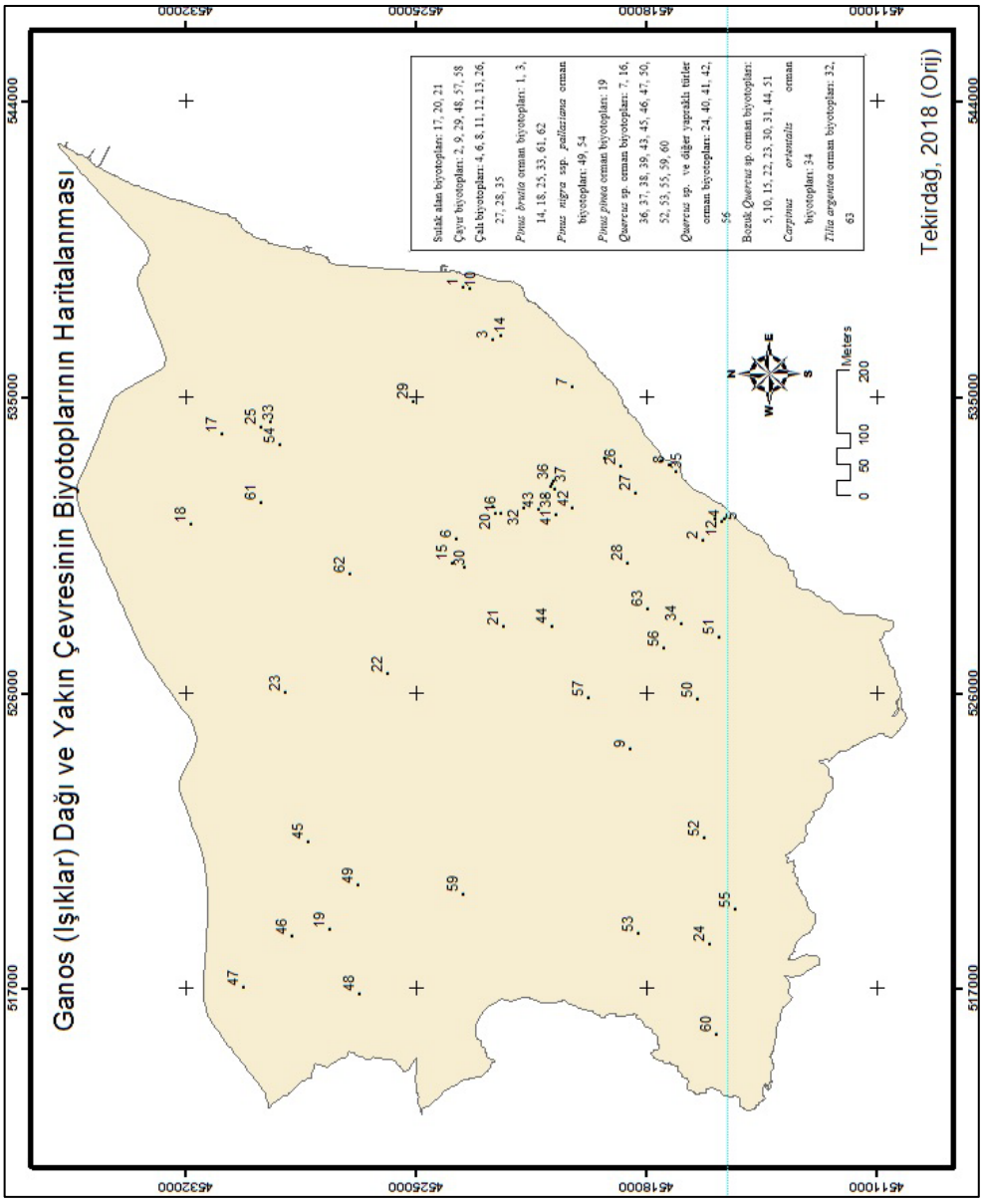

Figure 2: The biotope analyses of this research area are described below.

Wetland biotopes; The biotopes related to wetlands in the study area consist of ponds and streams located around Yeniköy, Yazır and Işıklar. In these areas with non-calcareous brown forest soil, plants which require high humidity are observed. The rivers compose hygrophilous *Platanus orientalis, Salix alba, Phillyrea latifolia* ve *Rubus sanctus* tree and shrub groups through the level areas they flow. In the sunny openings near the wetlands; *Lamium purpureum* var. *maculatum*, *Ranunculus constantinopolitanus*, *Rumex crispus*, *Scirpus sylvaticus* ve *Alisma aquatica* herbaceous vegetation is intensely seen. These species are partly accompanied by *Arundo donax*, *Clematis vitalba*, *Convolvulus arvensis* and *Lycopus europaeus*. The dominant species is the *Scirpus sylvaticus*.

Meadow biotopes; The meadow biotopes in the research area cover a large space in the areas where the oak forests are destroyed and the shrubs where the maquis species dominate. These biotopes are often found in areas where brown forest soil dominates. In the vicinity of Naip the soil is alluvial and the largest plant diversity is seen in these areas. It is formed by numerous herbaceous taxa under the dominance of *Poaceae* and *Asterceae* species. In this vegetation, the coverage rate is around 80%. The most important plants that represent the biotope are *Anthemis cretica*, *Avena sterilis*, *Bromus ramosus*, *Cynosurus echinatus* and *Hordeum murinum* ssp. *glaucum* and the dominant species is *Lolium perenne*.

Shrub biotopes; The shrub biotopes in the research area consist of maquis flora elements. This frost-sensitive vegetation spreads mainly in areas with the sea effect. The dominating species of the biotope are *Cistus parviflorus*, *Juniperus oxycedrus* ssp. *oxycedrus*, *Paliurus spina-christii*, *Phillyrea latifolia* and *Spartium junceum*. In these areas, herbaceous species are not very common but the floristic composition is quite rich. The most common plants in the field are *Avena barbata* ssp. *barbata*, *Crupina vulgaris*, *Glacium flavum, Hordeum murinum* ssp. *leporinum*, *Hypericum perforatum* and *Lolium perenne* and the dominant taxon is *Glacium flavum*. Anthropogenic effects have been observed in some parts of biotopes and ruderal vegetation has been determined in these areas which increase the diversity of herbaceous species. *Centaurea calcitrapa* var. *calcitrapa*, *Psorolea bituminosa*, *Scabiosa atropurpurea*, *Echium angustifolium*, *Euphorbia falcata, Plantago lagopus, Rumex conglomeratus* and *Rumex crispus* taxa constitute a large space in these areas. Coniferous forest biotopes; Forest biotopes which are dominated by *Pinus brutia*, *Pinus nigra* ssp. *pallasiana* and *Pinus pinea* have been examined in the scope of the research. Forest biotopes dominated by *Pinus brutia*; The *Pinus brutia*, which is not very selective in terms of soil requirements, is mostly found in brown forest soil in the research area. This area is dominated by bedrock containing sandstone- claystone and siltstone. Its being congenial allows this taxon to grow in different ecological condition and it has been determined that there is a significant difference in the number of accompanying plants and the rate of participation. It has been observed that the *Pinus brutia* biotopes are located on the coastal region and on the slopes facing the shore within the area, therefore, they are accompanied mostly by maquis vegetation species (*Cistus parviflorus, Juniperus oxycedrus* ssp. *oxycedrus, Phillyrea latifolia, Spartium junceum, Pistacia terebinthus* ssp. *terebinthus* and *Quercus petraea* ssp. *petraea*). The most common herbaceous vegetation in these biotopes is *Centaurea calcitrapa* var. *calcitrapa*, *Hordeum murinum* ssp. *glaucum*, *Hypericum perforatum*, *Lolium perenne*, *Psorolea bituminosa*, *Scabiosa atropurpurea* and the most dominant species is *Hypericum perforatum*. Especially *Datura stramonium*, *Malva neglecta*, *Psorolea bituminosa* and *Scabiosa atropurpurea* taxa have been observed to develop in ruderal areas where anthropogenic effects increased.

Forest biotopes dominated by *Pinus nigra* ssp. *pallasiana*; *Pinus nigra* ssp. *pallasiana* biotopes, which are seen in small groups throughout the research area, are plantation areas and are usually blended with leafy trees. This species, which is resistant to winter cold and drought, is mostly located in the inner parts. *Pinus nigra* ssp. *pallasiana* which spreads in the areas where brown forest soil is dominant, sets stand with species such as *Carpinus orientalis* and *Quercus robur* ssp. *robur*. In the areas where the forests are destroyed, the composition is accompanied by maquis species like *Pistacia terebinthus* subsp. *terebinthus*, *Cistus parviflorus*, *Juniperus oxycedrus* ssp. *oxycedrus* and *Spartium junceum*. The predominant species of the biotope, in which plant species diversity and density are relatively low, has been identified as *Lolium perenne*.

Forest biotopes dominated by *Pinus pinea*; In the research area where mild maritime climate is dominant, it has been observed that *Pinus pinea*, a congenial species, is preferred in the afforestation studies carried out in recent years. The forestation area in the vicinity is still in the youth stage and the tree is not formed. The biotope, in which *Pinus pinea* is still on the shrub phase, is accompanied by maquis such as *Juniperus oxycedrus* ssp. *oxycedrus*, *Pistacia terebinthus* ssp. *terebinthus* and *Cistus parviflorus*. The fact that the woody plant cover does not create occupancy allowed the development of herbaceous vegetation and increased the density of species such as *Anthemis tinctoria*, *Avena sterilis*, *Hordeum murinum* ssp. *glaucum*, *Poa trivialis*, *Scabiosa atropurpurea*, *Torilis arvensis* and *Trifolium pretense*. The dominant species of the biotope is *Trifolium pratense* var. *pratense*.

Broad- leaved forest biotopes; In this context, the vegetation analysis of forest biotopes dominated by *Quercus* sp., *Carpinus orientalis* and *Tilia argentea* were made.

Forest biotopes dominated by *Quercus* sp.; The maquis vegetation, which is seen in the coastal areas, yields to *Quercus* sp. forests southwards. Due to the ecological conditions of the study area, these biotopes occupy a large space within the area, spreading at different elevations starting from the sea level. *Quercus* sp. communities spreading within the area have been explained by grouping for better understanding. These biotopes have been investigated as *Quercus* sp., mixed leaf biotopes dominated by *Quercus* sp., and corrupted *Quercus* sp. biotopes.

Quercus sp. forest biotopes; These biotopes consist of *Quercus frainetto*, *Quercus infectoria*, *Quercus robur* ssp. *robur* and *Quercus petraea* ssp. *petraea* species. These plants which locally set pure forests are accompanied by *Acer campestre* subsp. *campestre*, *Carpinus orientalis* and *Sorbus torminalis* var. *torminalis* from place to place. Especially in the coastal areas; species of maquis vegetation such as *Laurus nobilis*, *Pistacia terebinthus* ssp. *terebinthus*, *Cistus parviflorus*, *Juniperus oxycedrus* ssp. *oxycedrus*, *Phillyrea latifolia* and *Spartium junceum* are seen. Having limited occupancy as well as the openings in the forest and the forest edges allow for the development and diversification of herbaceous vegetation. The most common plant in the herbaceous layer is *Agrostis gigantea*, *Avena barbata* subsp. *barbata*, *Centaurea calcitrapa* var. *calcitrapa*, *Dactylis glomerata*, *Hypericum perforatum*, *Muscari comosum* and *Psorolea bituminosa* and the dominant taxon is *Lolium perenne*.

Mixed leaf forest biotopes dominated by *Quercus* sp.; It is mostly spread through the non-calcareous brown forest soil dominated by sandstone-claystone-siltstone bedrock. These biotopes are mixed with *Olea europaea*

var. *europaea*, *Pinus brutia* and *Pistacia terebinthus* ssp. *terebinthus* in regions where mild maritime climate dominates. As the temperature goes down towards the inner parts, *Acer campestre* ssp. *campestre*, *Carpinus orientalis*, *Fraxinus ornus* and *Platanus orientalis* is also involved. The most common herbaceous vegetation cover in research areas consists of *Agrostis stolonifera*, *Anthemis tinctoria* var. *tinctoria*, *Briza maxima*, *Glacium flavum*, *Helianthemum nummularium*, *Lolium perenne*, *Origanum vulgare*, *Phleum subulatum*, *Psorolea bituminosa*, *Rapistrum rugosum* and *Scabiosa atropurpurea* taxa. The coverage rate of the herbaceous layer is about 60%, the dominant species of the biotopes is *Lolium perenne*.

Corrupted *Quercus* sp. biotopes; Some *Quercus* sp. biotopes in the research area have undergone destruction due to anthropogenic effects. It was observed that these areas were gradually covered with maquis and turned into shrubs. In these areas spreading in coastal areas where mild maritime climate dominates, maquis such as *Cercis siliquastrum*, *Olea europaea* var. *europaea*, *Pistacia terebinthus* ssp. *terebinthus*, *Cistus parviflorus*, *Osyris alba*, *Juniperus oxycedrus* ssp. *oxycedrus*, *Paliurus spina-christii*, *Phillyrea latifolia*, *Spartium junceum* occupy space intensely. The maquis vegetation is accompanied by ruderal vegetation elements such as *Centaurea calcitrapa* var. *calcitrapa*, *Crepis vesicaria*, *Plantago lanceolata*, *Psorolea bituminosa*, *Euphorbia amygdaloides* var. *amygdaloides*, *Malva sylvestris*, *Cirsium italicum*, *Dactylis glomerata ssp. hispanica* and *Hypericum perforatum*. Due to the limited occupancy, the diversity and density of the plant species seen in the grassy layer is high and the dominant species is *Lolium perenne*.

Forest biotopes dominated by *Carpinus orientalis*; It has been determined that the forest communities dominated by *Carpinus orientalis* seen on the slopes facing the north and damp riverbed throughout the research area, are scattered constrictedly within the area. This type is mostly mixed with *Acer campestre* ssp. *campestre*, *Fraxinus ornus* and *Quercus robur* ssp. *robur*. The growth of herbaceous vegetation in the lower cover is slow because of high occupancy on tree and shrub level. Species composing the grass layer is determined to be *Anthemis cretica*, *Cirsium baytopae*, *Digitalis lanata*, *Melilotus alba*, *Onopordum tauricum*, *Raphanus rapistrum* and *Torilis arvensis*, whereas the dominant species is *Torilis arvensis*.

Forest biotopes dominated by *Tilia argentea*; *Tilia argentea*, which is seen locally in the area of study, is found in the brown forest soil of the bedrock containing sandstone-claystone-siltstone. Occupancy rates of these biotopes that mix with oak, ash, and hornbeam tree communities are around 60%. The fact that the coverage rate of *Ligustrum vulgare*, *Rosa canina*, *Rubus hirtus* and *Smilax excelsa* shrub layer is not high, allowed the development of herbaceous vegetation. The most common plants in these biotopes has been identified to be *Anthemis cretica*, *Brachypodium sylvaticum*, *Centaurea calcitrapa* var. *calcitrapa*, *Cynosurus echinatus*, *Euphorbia helioscopia*, *Geraniaum molle*, *Hypericum bithynicum*, *Lolium perenne*, *Poa trivialis*, *Ranunculus constantipolitanus* and *Trifolium campestre*. The dominant species is *Ranunculus constantipolitanus* and *Asperula tenella*, *Cardamine pratensis* are seen rarely.

4. Conclusion

Within the scope of this study where biotopes of the Ganos Mountain and their immediate surroundings were mapped, detailed data were collected about the flora presence and their habitats. This will help to identify and

protect the natural resources of the region, minimize environmental impacts that threaten the immediate environment, and ensure that natural values are transferred to future generations in a healthy manner. The results of the preliminary study are important in terms of preserving ecological and biological diversity and exemplifying the work to be done in areas with similar characteristics.

The results and recommendations regarding the biotopes in the research area are briefly described below:

Wetland; In the wetlands of the study area, pollution due to recreational activities is in evidence. Especially in the vicinity of Yazır these effects are seen intensely. However, these biotopes provide living space for hygrophilous vegetations such as *Alisma aquatica, Arundo donax* and *Scirpus sylvaticus* which are not seen anywhere else in the field. These biotopes need to be protected together with their habitat in order to conserve and maintain biological diversity. Because wetland resources form an integral part of the environment and their management must be pursued in the context of an interaction between conservation and the national development strategies [19].

Meadows; Meadow biotopes in the research area are located on fertile and low inclination valley bases. As the agricultural value of these areas is high, the field is getting narrower day by day because of agricultural activities. Especially in the vicinity of Naip which has alluvial soil, this effect is seen intensely. In these areas where plant species diversity is relatively rich, anthropogenic influences must be removed from the resultant degeneration and local people should be made aware of the biological presence of the area.

Shrub biotopes: The shrubs in the study area are close to the settlements and are exposed to pollution especially due to domestic wastes. However, these biotopes are rich in herbaceous species diversity and consists *Anagallis foemina*, *Carex distans*, *Crocus* sp., *Dracunculus vulgaris*, *Melissa officinalis*, *Miscanthus* sp., *Orobanche caryophyllacea*, *Ranunculus neopolitanus*, *Silene italica*, *Salvia amplexicaulis* and *Viscum album* taxa which are not seen in other biotopes. In the biotope, appropriate conditions must be established to eliminate the anthropogenic degeneration due to anthropogenic influences and to enable their self- renewal.

Coniferous forest biotopes; The coniferous forest biotopes in the research area consist of *Pinus brutia*, *Pinus nigra* ssp. *pallasiana* and *Pinus pinea* species. Considering the spatial distribution of these biotopes, it is observed that the *Pinus brutia* forests dominates the area. It has been observed that in some parts of the *Pinus brutia* biotopes seen along the coastal zone and along the valleys with the sea effect, social pressure has increased and environmental pollution has occurred. In addition to their natural landscape effect, as these biotopes provide a living environment to the rich Mediterranean vegetation elements, they should be conserved in terms of ecology and necessary sanctions must be applied to avoid the anthropogenic effects towards them. The *Pinus nigra* ssp. *pallasiana* and *Pinus pinea* biotopes seen in the research area are afforestation areas and the herbaceous diversity of these areas is limited compared to natural forests.

Broad- leaved forest biotopes: These biotopes consist of *Quercus* sp., *Carpinus orientalis* and *Tilia argentea* species. In the research area where temperate conditions prevail, it is the *Quercus* sp. biotope that occupy the most space. It has been observed that these biotopes, which are spread in the southern part of the area, are

subject to social pressure resulting from land use. Demolished areas which have intense anthropogenic effects, are gradually covered with maquis elements and turned into shrubs. The *Carpinus orientalis* communities, spreading in limited areas in the research area, offer unique landscapes with their herbal potentials as well as the color changes they created in the autumn, contributing to nature tourism and recreation. It is suggested that studies should be made to contribute to rural tourism by taking usage decisions with the awareness of nature conservation in planning. *Tilia argentea*, which composes mixed forests together with non- evergreen species in the research area, has good quality examples on dip slopes where mild maritime climate dominates. These biotopes, which are significant in terms of ethnobotany due to their flowers, offer a living environment for fruit trees and shrubs such as *Crataegus monogyna* subsp. *monogyna*, *Prunus spinosa* subsp. *dasyphylla*, *Cydonia oblonga*, *Rosa canina* and *Rubus hirtus*. These fruits, which play an extremely important role in the forest ecosystem, enable many species of birds, insects, and small and large mammal fauna to maintain their presence in the area.

Acknowledgements

This study was produced from the project NKUBAP.00.18.AR.14.06 that was supported by Namık Kemal University Scientific Research Project Coordinator.

References

[1] R. Yılmaz, S.J. Butt and A. Korkut. “Plant diversity and effects of environmental problems in Turkey”. Journal of Environmental Protection and Ecology. vol. 4, pp. 924-930, 2003.

[2] B.A. Chokor. “Environmental pressure groups and habitat protection in the developing world: The case of Nigeria”. The Environmentalist. vol. 12, no. 3, 1992.

[3] C. Güngöroğlu, N. Musaoğlu, M. Türkkan, O. Yöntem, A. Yılmaztürk and G. Çayır. Classification and Mapping Biotope Types Through GIS Based Remote Sensing Techniques- The Example of the Köprülü Kanyon National Park. South-west Anatolia Forest Research Institue, Antalya, Ministry of Environment and Forestry Publications no: 354, 2008.

[4] K.J. Lee, B.H. Han, S.H. Hong and J W. Choi. “A study on the characteristics of urban ecosystems and plans for the environment and ecosystem in Gangnam-gu, Seoul, Korea”. Landscape and Ecology Engeneering. vol. 1, pp. 207-219, 2005.

[5] T. Altan. A Research on the Application of Ecological Landscape Planning in Çukurova by Using Computer and Determination of the Land Uses Suggestion. Çukurova University Faculty of Agriculture Publications no: 161, 1982.

[6] M.E. Jensen, R.L. Redmond, J.P. Dibenedetto, P.S. Bourgeron and I.A. Goodman. “Application of ecological classification and predictive vegetation modeling to broad-level assessment of ecosystem health”. Environmental Monitoring and Assessment. vol. 64, no. 1, 2000.

[7] K. Löfvenhaft, C. Björn and M. Ihse. “Biotope patterns in urban areas: a conceptual model integrating biodiversity issues in spatial planning”. Landscape and Urban Planning. vol. 58, pp. 223-240, 2002.

[8] A.W. Küchler. “Ecological vegetation maps”. Vegetatio. vol. 55, pp. 3-10, 1984.

[9] T. Clare and R.G.H. Bunce. “The potential for using trees to help define historic landscape zones: A case study in the English Lake District”. Landscape and Urban Planning. vol. 74, no. 1, pp. 34-45, 2004.

[10] B. Üstün. “Remote sensing in erosion modelling; Ganos Mountain example”, Turkey Map Scientific and Technical Convention, Ankara, 2007.

[11] G. Eliçin. Flora of Işık Mountain (Ganos- Tekirdağ). Istanbul, Istanbul University Faculty of Forestry Publications, 1982, pp. 89.

[12] E. Özşahin. “The temporal change of the relationship between urban development and geomorphological units Tekirdağ”, International Periodical For The Languages, Literature and History of Turkish or Turkic. vol. 10, no. 1, 2015.

[13] C. Yarcı. “Phytosociological and ecological surveys on vegetation of Işıklar Mountain (Tekirdağ)”. Erciyes University Institue of Science and Technology. vol. 16, no. 1-2, 2000.

[14] A. Korkut. “Determination of some plant materials to be used in landscape planning affairs in the natural habitat of Thrace Region”. Journal of Agriculture and Forestry. vol. 17, pp. 315-330, 1993.

[15] A. Baytop. Pharmaceutica Botanic. İstanbul, İstanbul University Faculty of Pharmacy Publications no. 36, 1983.

[16] M. Özyavuz, A.B. Korkut and A. Özyavuz. “Native vegetation” Advances in Landscape Architecture, Edited by Murat Özyavuz, Intechopen.com INTECH, pp. 861-885, 2013.

[17] H. Sukopp and S. Weiler. “Biotopkartierung im besiedelten bereich der bundesrepublik Deutschland”. Landschaft + Stadt. vol. 18, no. 1, pp. 25-38, 1986.

[18] H. Sukopp and S. Weiler. “Biotope mapping and nature conservation strategies in urban areas of the Federal Republic of Germany”. Landscape and Urban Planning. vol. 15, no. 1- 2, pp. 39-58, 1988.

[19] S.L.J. Fernando and N.M. Shariff. “Site suitability analysis for ecotourism development at the Kirala Kele partial-nature-based wetland of Southern Sri Lanka”. Basic and Applied Research (IJSBAR). vol. 32, no. 3, pp 89-104, 2017.