

Problems Caused by Wildlife in Urban Areas; Case Study of Kastamonu

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Abstract: The rapid change process of the world and the increase in population cause destruction of nature, pollution of air, water and soil, and deterioration of ecological balance. This damage is increasing in parallel with the population of the world, especially in the urban centers. Today in Turkey, approximately 92.5% of the population lives in urban areas, rural-urban migration is still in progress, it is estimated that urban population will keep increasing further in the future. The increase in the population density in urban centers has increased the need for new settlement areas and the urban centers have started to grow gradually and their borders have started to expand this situation brought various problems with it.

The problems caused by wild animals in residential areas are among these problems. These problems are more intense especially in residential areas close to natural forest areas. Kastamonu city center is one of the areas where such problems are encountered frequently. In this study, some problems caused by wild animals in residential areas have been evaluated in case of Kastamonu. Within the scope of the study, first the wild animal species seen in the region were determined, then the harmful effects of these animals were investigated and grouped, and which animal species and how they caused these damages explained by samples.

Key Words: Wild life, Kastamonu, residential areas

I. INTRODUCTION

The world is going through a rapid change process which cause destruction of nature, pollution of air, water and soil, and deterioration of ecological balance together with the rapid increase of human population (Gülğün et al., 2014; Mutlu et al., 2013; 2016; Aydoğdu and Şevik, 2018). This damage is increasing in parallel with the population of the world, especially in the urban centers. While only the 13% of total population were living in cities in 1900s; this ratio rised up to 47% in the year of 2000. It is estimated that the 60-90% of the total world population will be living in cities by 2030 (Kurdoğlu and Düzgüneş, 2013; Şevik et al., 2016a). The situation in our country is also parallel to the world. According to the data of Turkey Statistical Institute Address-Based Population Registration System; while 71% of the total population of Turkey was living in cities in 2008, this ratio increased up to 92,5% in 2017, the ratio of people living in towns and villages were calculated as 7,5% (URL -1.2018). At the same time, the migration from the rural to urban is still going on and it is estimated that the population of the cities will keep increasing further in the future (Cetin et al., 2017).

The increase in population density in city centers has increased the need for new settlement areas and the city centers have started to grow and expand their borders (Kalayci and Birişçi, 2013). This has led to the transformation of agricultural and forest areas, especially at the border of urban centers, into residential areas. The transformation of agricultural and forest

areas into settlement areas has resulted in the shrinking of the habitats of living creatures living in these regions. The living creatures of which the habitats got shrunken, has started to step in residential areas from time to time in order to get their needs of shelter and food, those who adapted themselves to the urban environment settled their nests in residential areas while some others started to put up some or all of their food needs from the resources in urban areas (Toksoy et al., 2008; Sen and Gungor, 2018; Şen and Buğday, 2015; Sen et al., 2015).

This intervention of wild animals in the residential areas brought some problems for people living in these regions. These problems are more intense especially in residential areas close to natural forest areas. One of the areas where these problems are frequently encountered is Kastamonu city center. In this study, some problems caused by wild animals in residential areas were tried to be examined in the case of Kastamonu.

II. MATERIAL AND METHOD

The study was conducted in the city of Kastamonu. Kastamonu is located between 41°21' north latitude and 46°33' east longitude in north part of Turkey. The altitude of the city from the sea is 775 m. The city of Kastamonu which is located in the western Black Sea Region of Turkey forms boundaries with Black Sea in the North; Bartın and Karabük cities in the West, Çankırı in the South and Çorum in southeast. Kastamonu is settled and keeps its development along Karaçomak Stream, which is a branch of Gökırmak (Şevik et al., 2016).

Kastamonu is one of the cities with the highest ratio of forest area to total area. The boundaries of the city center are also significantly bordered by forests, so the interaction with the forest ecosystem is at a high level. This factor was effective on selecting Kastamonu as the case of the study.

Within the scope of the study, first the wild animal species seen in the region were determined, then the harmful effects of these animals were investigated and grouped, and which animal species and how they caused these damages explained by samples.

III. FINDINGS

Within the scope of the study, the effects of wildlife of which the natural habitat is not the residential areas, that constitute problems for people living in the city center of Kastamonu are determined as a list and then grouped. These harmful effects are indicated below;

a) Contaminative effects;

The first harmful effect of animals that comes to mind is the contaminative effect. Animals are living beings and, during their life cycle, they hold some functions, resulting in many contaminants as a result of their metabolic activities. These

contaminants are among the most important of the problems that arise in people's living spaces. Observations have shown that wild animals cause many pollutants that disturb one or more of the five sensory organs of people. These pollutants cause many discomforts including bad visualization, bad smell, disturbing sound. Contaminant effects caused by wild animals are grouped as follows.

i) Feces; The first thing that comes to mind when it comes to contamination caused by wildlife is animal feces. In the natural environment, animal feces can be seen as a factor which supports the ecosystem. The feces of animals are a source of nutrients for plants and an important factor in increasing soil fertility. Therefore, the feces used frequently in agricultural activities. However, in residential areas covered with pavements mostly animal feces constitute an important problem. Animal feces cause both a bad appearance in residential areas and is a source of bad smell. Additionally, as a result of their spreading ability, they can affect large areas. In Kastamonu city center, this problem is encountered almost everywhere, especially in the areas where animals provide their food and shelter supplies this problem is bigger. In Nasrullah square and around some of the plane trees on the main street, this problem is so great that people who walk on the pavement have to change their ways when some areas can no longer be used by people. In addition, the feces of the birds nesting on the roofs or eaves of some public buildings and houses contaminate these areas extensively.

ii) Food residues; Animals execute two main functions in city centers. First of them is sheltering and the other one is food supply. The food residue of animals that provide food in city centers is a main problem itself. The residues of fruits eaten by animals such as mulberries, cherries, pears, apples are important contaminant factors. Moreover, especially the food residues of carnivorous animals both create a visually very bad image and create bad smell source. Likewise other problems caused by wild animals, as these problems are seen in Kastamonu in general, it is seen even more intensively in residential or school gardens where the fruit trees are planted more frequently.

iii) Body fluids, hair, feather, carapace, etc.; metabolic wastes of wild animals outside their feces are also a major contaminant. A variety of metabolic wastes, especially the saliva of many animals, is an important environmental problem, as well as the feathers of poultry, the hair of mammals, the skin left by snakes during molting. As this problem is also seen in Kastamonu in general, but it is felt more especially in areas where birds are living as gregarious.

iv) Shelters; Animals use a variety of materials to form their nests. These materials become an important source of contamination in case animal leaves it's nets or dies in some way. It is observed that mostly birds nest in city center of Kastamonu. In order to protect themselves from the predators they usually nest on trees, roofs of buildings or in the gaps of the garrets or chimneys etc. This problem is most commonly seen in areas where nests of pigeons and swallows are densely located.

v) The eggs; The eggs of some animals that nest in the city center constitute a problem on their own. Because the eggs can cause several problems at once. First of all, a young offspring that completes the normal course leaves behind egg shells as a contaminant. Besides, if the baby doesn't come out of the egg, the spoilt egg spreads an extremely disturbing smell when broken. In addition, since an animal's egg is a food source for

many other animals, the consumption of food by other animals causes the egg wastes to be both a source of visual contamination and a source of bad smell. It is also a frequent problem that eggs block the chimneys, water discharge pipes, ventilation ducts and so on.

vi) Animal carcasses; The carcasses of animals are one of the most important contamination sources. Naturally, animal deaths frequently occur in the city by the influence of human, other predators or natural events. Animal carcasses begin to decompose after a short period of time, and are both a source of visual contamination and a heavy stink. Insects, germs or viruses that settle on these carcasses also constitute a separate problem.

vii) Noise; noise is a factor that can disrupt human comfort and create a health threat. The noise caused by wild animals, especially birds, in residential areas is an important problem. Especially the noise caused by the sparrows living as gregarious and the pigeons that live in the nests on the balconies, roofs and chimneys of the houses constitute an important problem.

b) Loss of Life or Property

Loss of life or property is a problem that is much less frequent than contaminant effects of wildlife but much more effective. These problems, which are caused by wild animals, can be grouped as follows:

i) Damages they directly cause; wild animals have various defense mechanisms to meet their food needs and to be able to cope with other predators. While the teeth of most mammals are specialized to catch and shred their prey, the poison that some animals secrete provides them an extra advantage. Therefore, it is known that incase wild animals meet a human, generally by acting with the instinction of protecting themselves they harm or even cause the death of people. This problem is mostly encountered in slums of Kastamonu with low-rise houses in gardens. It is known to be due to large amounts of green areas and the closeness to the forests of these regions, wild animals are seen in these areas more frequently and in case of sudden encountering of wild animals and human beings end up with harms such as bites, poisoning, etc., which can even cause deaths.

ii) Traffic accidents; Especially the accidents caused by night predators are an important problem. Due to the effect of wild animals, dozens of traffic accidents occur every year almost all of which end up with financial loss but traffic accidents causing injuries or even deaths are also taking place. While the wild animals in small sizes such as foxes, hedgehogs, rabbits generally cause traffic accidents resulting in financial loss; animals that live as gregarious such as boars may cause accidents with more serious consequences.

iii) Transmitting the Diseases; There are many disease factors which wild animals host. These disease factors can pass directly or indirectly to pets or people. Insects carried by birds nesting on houses are a particular problem. Besides, important disease factors such as bird flu, swine flu and acarids can also cause problems by being transferred to urban areas by wild animals.

iv) Damage on pets, goods and infrastructure; wild animals can cause significant damage to the pets, goods, and urban infrastructure that people have while meeting their shelter and food needs in residential areas. It is often the case that pets are damaged by wild animals in areas where detached houses with gardens are located in Kastamonu city center. Especially

predators such as foxes, hedgehogs, martens, falcons are important threats to domestic poultry as well as many domestic animals such as rabbits and domestic birds. In addition to these, there are animals that damage the drainage or irrigation system underground, which dig the ground to gain space for their need of shelter.

c) Cause of fear and panic

The sudden fear or panic occurring reflexively in case of encountering especially the animals known as poisonous or predators such as snakes, weasels, martens, jackals and foxes can cause various problems. Although it is more possible just to fall down with the horror effect experienced during the first reaction of encountering a wild animal, this reaction can cause serious injuries in cases such as when the traffic is dense or glass breaks may occur. Even very rarely, it can lead to consequences such as a heart attack.

d) Fire and flood hazard

Nests, carcasses and even themselves of wild animals can cause fire and flood from time to time. Nests of wild animals are usually made of materials such as wood fragments, leaves etc.. These materials are easily flammable materials, and any spark reaching the nests is a fire hazard. In addition to this, nests that are settled in places such as water discharge pipes on roofs etc. can cause blockage of the pipes which can lead to floods. The maintenance and cleaning done every year in the residences in order to prevent this danger, constitute an important expenditure item, and several animal carcasses are found besides the nest especially in roofs or water discharge pipes. In addition to these, the animals themselves are also a flammable substance and it is stated that it is an important factor especially in the spread of fires. It is stated that one of the greatest factors in the fire spreading in the historical places in Istanbul and in the forest fire in Kastamonu near the city center is the animals living in these areas and carrying flames to the other spots during the fire.

IV. RESULTS AND RECOMMENDATIONS

As a result of the study, the harmful effects of the wild animals in Kastamonu city center were tried to be determined as outlines. The main causes of these effects of wild animals are the activity of people constantly restricting the habitats of wild animals. As a consequence of the migration from rural to urban areas, the boundaries of urban centers are moving towards wildlife habitats, resulting in migration of wildlife to survive or to meet some needs such as shelter and food from residential areas.

Although they seem as concrete jungles, there are significant numbers of plants within residential areas. Especially nowadays, the amount of green area is considered as a sign of development, and people prefer residential areas with more green areas (Cetin and Sevik, 2016; Cetin et al., 2017). Plants that are grown in residential areas fulfill many ecological, economic and social functions. Plants add aesthetic value to their growing environment (Cetin, 2017); they have positive psychological effects on people (Cetin, 2015) and contribute to people to work more efficiently (Cetin and Sevik, 2016). They have positive effects on human health such as decreasing the noise as well as contaminant factors such as particulate matters, CO₂ and heavy metals in the air (Tani and Hewitt, 2009; Aricak et al., 2016; Cetin et al., 2017, 2018; Sevik et al., 2017). They provide the production of economically valuable primary and secondary products (Sevik, 2012). Apart from these, they also perform a number of other functions, such as

erosion and flood prevention (Kinis and Duyar, 2012; Duyar and Makineci, 2016).

In addition the plants function in providing nest and food for wildlife (Cetin et al., 2017b). Although this situation is being reflected as a positive one, existence of wild animals in residential areas many problems such as the ones mentioned above, and it is possible that there may be additional other problems in the future which are not foreseen yet. Bird flu and Crimean-Congo hemorrhagic fever which was spread by acarids are good samples of these problems which were seen in the past.

The issue of wild animals must be assessed objectively. It should not be forgotten that the harmful effects caused by these animals are a consequence of their biology and most of them are the result of the effects of people on natural habitats of wild animals. Therefore, taking into consideration this situation in urban planning studies, can remove most of the problems caused by wild animals.

References

- [1] Aricak B, Enez K, Özer Genc, C, Sevik H. (2016). A Method Study To Determine Buffering Effect Of The Forest Cover On Particulate Matter And Noise Isolation, 1st International Symposium of Forest Engineering and Technologies (FETEC 2016), 177-185.
- [2] Aydođdu, A., Şevik, H., 2018. Indoor air quality: The samples of Ilgarini and Mantar caves, Social Science Studies Journal. 4(16); 1165-1176
- [3] Cetin M, Sevik H, Yigit N, Ozel HB, Aricak B, Varol T (2018) The variable of leaf micromorphological characters on grown in distinct climate conditions in some landscape plants. Fresenius Environmental Bulletin, 27(5): 3206-3211.
- [4] Cetin M. (2017). Change in Amount of Chlorophyll in Some Interior Ornamental Plants, Kastamonu University Journal of Engineering and Sciences 3(1):11-19, 2017
- [5] Cetin M. 2015. Evaluation of the sustainable tourism potential of a protected area for landscape planning: a case study of the ancient city of Pompeipolis in Kastamonu. International Journal of Sustainable Development & World Ecology. 2015c; 22 (6): 490-495
- [6] Cetin M., Mossi M.M.M., Ahmaida E.A., Sevik H. (2017b). The exchanging of leaf micromorphological characters in *Pyracantha coccinea* depends on traffic intensity. The 3rd International Symposium on EuroAsian Biodiversity, 05-08 July, 2017, Minsk, Belarus.
- [7] Cetin M., Sevik H. 2016b. Measuring the Impact of Selected Plants on Indoor CO₂ Concentrations. Pol. J. Environ. Stud. 25(3), 973-979
- [8] Cetin, M., Sevik, H. 2016. Assessing Ecotourism Potential Areas Through a Case Study in Ilgaz Mountain National Park, Tourism - From Empirical Research Towards Practical Application, DOI: 10.5772/62573. Chapter 5, p: 81-110, InTech, May, 2016
- [9] Cetin, M., Sevik, H., Isinkaralar, K. 2017a. Changes in the particulate matter and CO₂ concentrations based on the time and weather conditions: the case of Kastamonu. Oxidation Communications, 40(1-II), 477-485.
- [10] Cetin, M., Yigit, N., Ozel, H.B., Sevik, H. 2017. The changing of leaf micromorphological characters on grown in different growth conditions in *Buxus sempervirens* plants. Nature, Environment and Earth Science (In Press)
- [11] Duyar A, Makineci E. 2016. The seasonal variation of arthropods living on forest soil at different altitudes in fir (*Abies nordmanniana* subsp. *bornmulleriana*) ecosystem

- in Bolu-Aladağ. *Journal of the Faculty of Forestry Istanbul University*. 66(2), 572-586.
- [12] Gülgün, B., Güney, M., A., Aktaş, E., Yazıcı, K., 2014. Role of Landscape Architect in Interdisciplinary Planning of Sustainable Cities. *Journal of Environmental Protection and Ecology* 15, No 4, 1877–1880 (2014).
- [13] Kalaycı A., Birişçi, T., 2013. Kentsel Dönüşüm Sürecinde Değerlendirilmesi Gereken Sosyal Parametrelerin Peyzaj Mimarlığı Açısından İrdelenmesi, 5. Peyzaj Mimarlığı Kongresi, Adana.
- [14] Kinis, S., Duyar, A. (2012). Snowfall Acidity in Fir Forest. *Kastamonu University Journal of Forestry Faculty*, 12(3); 246-250
- [15] Kurdoğlu, O., Düzgüneş, E. (2011). Artvin kent ormanının rekreasyon olanakları ve kullanıcı tercihlerinin irdelenmesi. *Artvin Çoruh Üniversitesi Orman Fakültesi Dergisi*, 12(2), 199-210
- [16] Mutlu E, Demir T, Kutlu B, Yanık T. 2013. Sivas - Kurugöl Su Kalite Parametrelerinin Belirlenmesi, *Türk Tarım-Gıda Bilim ve Teknoloji Dergisi*. 1(1): 37 - 43
- [17] Mutlu E, Kutlu B, Demir T. 2016. Assessment of Çınarlı Stream (Hafik-Sivas)'S Water Quality via Physico-Chemical Methods, *Turkish Journal of Agriculture-Food Science and Technology*. 4 (4): 267-278
- [18] Sen, G., Bayramoglu, M. M., Toksoy, D. (2015). Spatiotemporal changes of land use patterns in high mountain areas of Northeast Turkey: a case study in Maçka. *Environmental monitoring and assessment*, 187(8), 515.
- [19] Şen, G., Buğday, S. E. (2015). Kastamonu İlinde çeşitli statülerde koruma ve kullanma amaçlı belirlenmiş alanlar. *Kastamonu Üniversitesi Orman Fakültesi Dergisi*, 15(2), 214-230.
- [20] Sen, G., Gungor, E. (2018). Analysis of land use/land cover changes following population movements and agricultural activities: A case study in northern Turkey. *Applied ecology and environmental research*, 16(2), 2073-2088.
- [21] Sevik H., Cetin, M., Kapucu O., Aricak B., Canturk U. (2017). Effects of Light on Morphologic and Stomatal Characteristics of Turkish fir Needles (*Abies nordmanniana* subsp. *bornmulleriana* Mattf.), *Fres. Env. Bulletin*, 26(11): 6579-6587.
- [22] Şevik H, Öztürk S, Çetin M. 2016. Peyzaj Çalışmalarında Kullanılan Bitkilerin Zararlı Etkileri (Kastamonu Örneği). *Düzce Üniversitesi Bilim ve Teknoloji Dergisi*, 4, 486-492
- [23] Tani, A. & Hewitt, C. N. (2009). Uptake of aldehydes & ketones at typical indoor concentrations by houseplants. *Environ Sci Technol*. 43(21), 8338.
- [24] Toksoy, D., Sen, G., Özden, S., Ayaz, H. (2008). The forestry organization and its relationship with local people in the Eastern Black Sea Region of Turkey. *New Mediterr*, 4, 47-53.
- [25] URL1: <http://www.tuik.gov.tr>. 01.05.2018