AN INVESTIGATION ON RELEASING TREATED WILD ANIMALS INTO THE NATURE IN TURKEY

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Abstract. The purpose of this study was to evaluate the general profile of wildlife in Turkey in terms of injured wild animals, their treatment and re-introduction to the nature. It was analysed the records regarding the Treatment and Rehabilitation of wild animal, collected from 2012 to 2015 and determined the number of wild animals injured in nature and treated, the number reintroduced to nature, the amount settled in zoos and having died during this process. Of 11,110 treated animals, 50.18 % were reintroduced into nature, 24.95 % were settled into zoos and the remaining 24.87 % died. However, the evaluation in this study also showed that the number of both harmed and dead animals in nature has been gradually increasing by years ($p < 0.05$). This study covered a general evaluation of the damage on the wild animals in Turkey; therefore there is a need for detailed exploration of these damages, including the causes, consequences and proposals for solutions in the future. In this context, it is also important to increase opportunities for cooperation between Ministry of Forestry and Water Affairs, other countries, universities and relevant NGOs.
Keywords: *recording system, conservation, rehabilitation, wildlife damage*

Introduction

Turkey is a rich country in terms of the variety of species within its three bio-geographical zones, Europe-Siberia, Mediterranean and Iran-Turanian (Demirsoy, 2002; Eken et al., 2006; Atalay and Efe, 2015). As in other countries, however, industrialization and technological development, population growth, unplanned urbanization, thoughtless use of agricultural chemicals, environmental pollution and drying out of water sources, continues to cause serious habitat loss that threatens Turkey's wildlife (Hadidian et al., 2006; Ogurlu, 2008; Aslan et al., 2011; Akkuzu et al., 2015). Diseases, injuries and death in wild animals are mostly due to human activity and unnatural causes (Vitouse et al., 1997; Sanderson et al., 2002; Manfredo and Dayer, 2004; Thompson et al., 2010; Burton and Doblar, 2004). In many developing countries, with widespread poverty and weak institutionalization, intense pressures to hunt, and the conversion and fragmentation of wildlife territories cause conflicts between humans and wildlife (Bulte and Rondeau, 2007; Gore et al., 2008; Chynoweth et al., 2016; Ambarlı et al., 2016). Yet, wildlife is not only critical to maintaining the integrity of the earth's ecosystem but wild animals are also biological indicators of environmental conditions in urban and rural areas. Although public interest in wildlife has increased nowadays, wildlife species and habitats are more threatened than ever before. In

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response, the rehabilitation of wildlife has been highlighted in recent years, with studies being conducted with official rehabilitation centers on how to mitigate human impact on wildlife (Burton and Doblar, 2004). The determination of morbidity and mortality rates in wildlife is important for both wildlife conservation projects and resettlement or relocation projects (Gilmartin et al., 1993). As well as its importance for ecosystems, wildlife is also a significant risk element in the emergence of new zoonoses (Cabello and Cabello, 2008; Thompson et al., 2010; Rout et al., 2016). Approximately 75 % of emerging diseases during the past few decades have included zoonoses originating from wildlife (Bengis et al., 2004; Jones et al., 2008).

Responsibility for the protection, development and sustainable management of wildlife resources and biodiversity in Turkey lies with the Ministry of Forestry and Water Affairs. In Turkey, various laws have been enacted to protect, support and maintain wildlife for future generations, with various organizations for the conservation of nature being established and Turkey becoming a party to international conventions. Although new regulations prepared with a view to these conventions make an important contribution protecting wildlife, it is essential that Turkey continues to increase such efforts, and that the value of biological assets and their relevant rights are disseminated comprehensively (Aslım et al., 2012). The General Directorate, which is responsible for protecting wildlife resources and biological diversity, supporting them and preserving them for future generations, carries out its duties through 15 regional directorates under the General Directorate. Game and Wildlife Units within the regional directorates co-operate with Wildlife Rescue and Rehabilitation Centers established by the ministry, veterinary faculties and zoos, in accordance with protocols governing the protection, treatment and release of wild animals (www.ormansu.gov.tr).

This study is the first research to reveal the suppression on wildlife in Turkey and to draw attention to the damage in wild animals. Despite being a rich country in terms of wildlife, there is a big deficiency in Turkey in terms of the studies in this area. The sustainability of wildlife depends on the existence and continuity of such investigations. In this respect, the purpose of this study was to evaluate the general profile of wildlife in Turkey in terms of injured wild animals, their treatment and re-introduction to the nature and make recommendations.

Materials and Methods

The data used as the material of this study which covers the period between 2012 and 2015 was collected from the Department Directorate of Game and Wildlife of the Ministry of Forestry and Water Affairs (DKMPGM) in Turkey.

The research material comprises information forwarded to DKMPGM from the 15 regional directorates since 2012 while data for 2015 includes records to October. The records contain information regarding the number of animals seized for violation of Law 4915 (Official Gazette, Date: 11/7/2003, Number: 25,165) and the CITES convention (Convention on International Trade in Endangered Species of Wild Fauna and Flora – Accession: 23/09/1996, Entry: 22/12/1996), the number of animals harmed in nature and treated, the number of treated and released animals, and the number of animals placed into rescue centers or zoos. The number of dead animals was calculated from inventory records. Data regarding seized animals for violating Law 4915 and the CITES convention were eliminated. Data were analyzed by using SPSS 20.0 computer software package program. General analysis of data

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was carried out using frequency counts and percentages. Comparisons between the annual records of wild animals was performed by ANOVA and significance was tested by Duncan test.

Results and Discussion

The relevant inventory figures for wild animals registered by the DKMPGM between 2012 and 2015 is given in *Table 1* and shows the number of animals recorded yearly.

Table 1. *Numbers of suffering wild animals registered 2012-2015*

Year	Animals treated and released into nature[A]	Animals treated and placed in the rescue centers/zoos[B]	Dead animals[C]	Total animals harmed in nature and treated[A+B+C]
2012	821	408	451	1680
2013	1211	643	535	2389
2014	1763	830	734	3327
2015	1780	891	1043	3714
TOTAL	5575	2772	2763	11110

[A+B+C]Total animals harmed in nature and treated

The total number of animals registered over the four years categorized by registration criteria is given in *Figure 1* of 11,110 wild animals harmed in nature and treated within this four year period, 50.18 % were released back into nature, 24.95 % were placed in zoos and the remaining 24.87 % died. The proportion of animals treated and released in Turkey was 50.18 %, which is consistent with a study of RIAS in, Portugal, a wildlife rehabilitation center. In 2015, this centre received 1,335 wild animals including reptiles, birds and mammals. Of these 52.3 % was released in to nature after treatment and rehabilitation while 22 % deaths were determined (http://www.aldeia.org/portal/user/documentos/relatorio_RIAS_2015.pdf.).

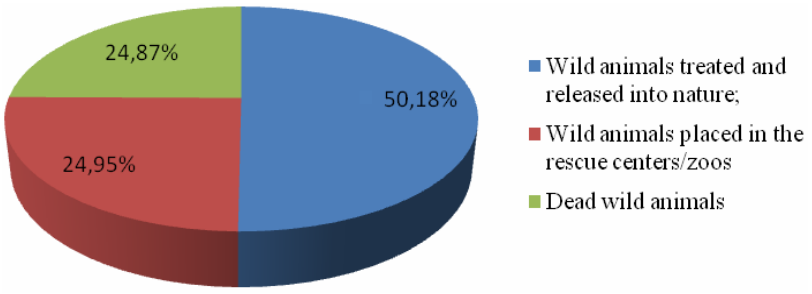

Figure 1. *The total distribution of wild animals registered during 2012-2015 (4 years)*

The distribution of recorded wildlife by taxonomic group shows that almost 85 % of registered species were birds and mammals (*Figure 2*). As *Figure 2* shows, according to the number of animals registered, the most frequently injured and/or diseased species in Turkey are birds. However, because there were no data about the causes of injury

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and/or disease, the researcher could not compare and/or analyse these issues in the study. Records are also available, in fewer numbers than for birds or mammals, for invertebrates, fish, amphibians and reptiles. Due to the seasonal changes concomitant with its geographical location, many species use Turkey as a feeding area or overwintering and breeding area (Baran, 2005; Kiziroğlu, 2008). Furthermore, Anatolia is also a transit zone during spring and autumn bird migrations, with many species migrating across Turkey between Europe, Africa and Asia (Hagemeijer and Mundkur, 2006; Üner et al., 2010; Şekercioğlu et al., 2011).

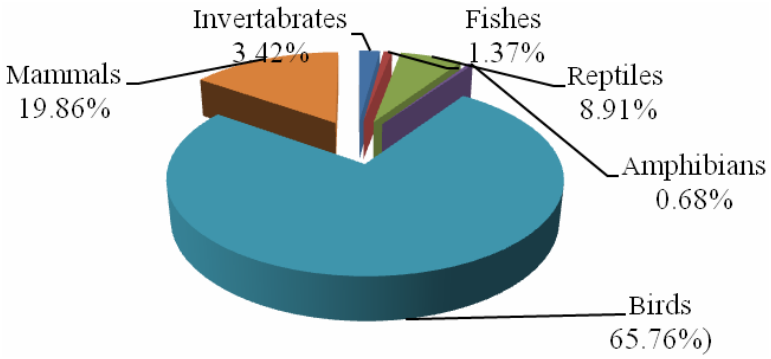

Figure 2. *The taxonomic distribution of recorded wild animals*

The categorization of the recorded wild animals by loss and compensation status is evaluated in *Table 2*. It clearly shows that number of wild animals that were harmed and died in nature. However, the number of wild animals released or placed into zoos has not changed.

Table 2. *Changes in recorded damaged wild animals by year*

Years	Animals treated and released into nature[A]	Animals treated and placed in the rescue centers/zoos[B]	Dead animals[C]	Total animals harmed in nature and treated[A+B+C]
	Mean±SE	Mean±SE	Mean±SE	Mean±SE
2012	54.73±7.54	27.20±7.74	30.07±8.99^{b}	112.00±17.84^{c}
2013	80.73±15.17	31.07±17.37	35.67±7.48^{b}	159.27±22.39^{b}
2014	117.53±24.40	55.33±11.69	48.93±11.37^{ab}	221.80± 38.48^{b}
2015	118.80±31.47	68.07±20.52	69.53±12.46^{a}	256.40±56.94^{a}
P value	0.12	0.19	0.04*	0.04*

$^{A+B+C}$Total animals harmed in nature and treated

*Means in the columns followed by different letters indicate statistically significant differences ($P < 0.05$)

According to *Table 2* while this study found no difference in the data between numbers of animals released into nature or placed into zoos while there were significant ($p < 0.05$) increases in both total animals harmed in nature and treated and both failed to respond to treatment and subsequently dead animals. The reason for this statistical increase in the number of animals dying by years may be related to the increase in the number of animals damaged in the nature by years. The increase in the

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number of animals damaged in the nature may be due to human activity and unnatural causes by years (Ogurlu, 2008; Aslan et al., 2011; Akkuzu et al., 2015).

The reason for the increase in the number of dead wild animals in recent years may be resulted from both the education and implementation studies on the treatment and rehabilitation of wild animals in Turkey have started relatively recently compared with many countries and the numbers of wildlife rescue and rehabilitation centers and the numbers of veterinarians and wildlife experts are inadequate. Although it seems ironically, the recent increase in the number of harmed and deaths in wild animal might have been due to the increase of the result of conservation and monitoring activities, scientific projects, social awareness and training activities of DKMPGM in cooperation with universities and NGOs; by this way it may be easier to access and record than in the past.

Conclusion

Consequently, in this research it was found that the damage of wild animals was increasing from by years. This situation shows that wild animals are under some threats in Turkey. These threats on wildlife should be identified and produced solutions. The decisions taken by DKMPGM to establish a Wildlife Rescue and Rehabilitation Center in each region promises hope for the future of Turkey wildlife. Additionally, increasing the number of wildlife rescue and rehabilitation centers, providing opportunities for the training of wildlife veterinarians and rehabilitators, supporting wildlife researches, dissemination conservation and awareness-raising activities are important for sustainable wildlife in Turkey. In this context, it is also important to increase opportunities for cooperation among the government ministry, other countries, universities and relevant NGOs. This study is the first research about the Turkey wildlife damage. Following this first study, which investigates the suppression of wild animals in Turkey, there is a need for studies that include causes, consequences and suggestions for solutions of casualties on wild animals in Turkey. These studies are important not only for the wildlife of Turkey, but also for the sustainability of the wild life which is the common ecological heritage of the whole world.

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