

NEMUNAS LOOPS REGIONAL PARK FORMATION AND APPLICATION POSSIBILITIES OF DIGITAL MAP

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Abstract

In order to preserve protected areas and to reduce their devastation, it is important to know the most common violations of these areas. The created map will provide the information about areas where the damage occurs most often. The Nemunas Loops Regional Park was selected for the research, the main aim of which was to identify the most common violations and the most problematic areas. The objectives of this research were to carry out a detailed analysis of violations in the Nemunas Loops Regional Park and protected areas for 2007-2014 period of time and to create a dot distribution map of these violations. The main tasks were the following: 1) to review the aim of the Nemunas Loops Regional Park establishment, prohibited and promotional activities, 2) to carry out the classification of violations in these areas during 2007-2013 according to the Code of Administrative Offences of the Republic of Lithuania, 3) to group the violations of 2007-2013 according to the timing and to create a dot distribution map in order to provide its application possibilities.

The study led to the following conclusions: most violations were made contrary to the requirements of the protected areas (Clause 76). For instance, arbitrary constructed mobile homes, environmental pollution, violations of visiting regime in the nature reservation, water protection requirements (Clause 55), parking a car in the protected area of the water reservoir, agricultural land, storing agricultural equipment which is not used etc. The map highlights the most problematic areas where violations occur every year. These are: Punios Šilas Strict Nature Reserve and the areas around it, Pociūnai and Balbieriškis towns, Birštonas. In 2014 the form of reports was changed and it was not possible to analyse the violations in detail. It was a negative factor for this research because no accurate violations and areas could be recorded. For this reason the map was not created. 230 various violations happened in the Nemunas Loops Regional Park during the period of 2007-2014. The created map can be used as an additional measure for prevention of violations.

Key words: digital map, protected areas, LIS (Land Information System), GIS (Geographic Information System), administrative violations of law in the field of environmental protection.

Introduction

The main problems in the protected areas are associated with the locals, land users, tourism and recreation. It is very difficult to preserve the area when it is used for other purposes. The priorities of tourism development should not enter into conflict with the environment. (Heberlain, 1993; Howarth, 1993). Solving environmental problems, it is important to attract local communities, scientists and their latest achievements and to carry out educational activities. In order to protect these areas it is necessary to know the information about most common violations and the areas where they are carried out. When the recurring problems are known, more attention can be paid in solving them.

Lithuanian and foreign authors analyse this situation and provide statistical data. The attention of scientists proves the relevance of this problem. The main principles of nature conservation in the management of protected areas were identified by Mefee. G. K. and Caroll. C. R. (1994). The authors state that ecological processes must be maintained. The goals and objectives must come from ecological characteristics, features and the knowledge and understanding of systems.

The elimination of external threats, comprehensive utilization of positive factors and conservation of the evolutionary processes play important roles. The control must be versatile.

It is stated in the publication "Guide to Sustainable Tourism in Protected Areas" that protected areas are vitally important to our natural resource heritage. They are meant to preserve the species, ecosystem and the landscape. The natural heritage can be saved only if the nature is rationally used.

It is very important for natural resource conservation to smartly plan and organise everything. In the publication two parks in Lithuania (Žemaitija National Park and Kurtuvėnai Regional Park) are mentioned, although there is not much information about the main violations in these parks. Nemunas Loops Regional Park is not mentioned, but the types of violations in these parks are quite similar (Guide, 2014).

Most of the authors provide statistical material in the form of tables and graphs. This information is important, but not always detailed. It is not oriented in space, indicating a fairly large area. GIS technology allows to store data in the attribute tables and to orientate it in space, in other words, to link it to a specific area (Papišienė, 2014).

These methods are applied to the accounting of agricultural areas (Bykovienė et. Al., 2014; Gudritienė et. Al., 2015), the analysis of agricultural land usage tendency (Abalikštienė et. Al., 2013; Abalikštienė et. al., 2015). At present, georeferenced data are applied in a lot of fields in Lithuania (Kryžiauskas et. Al., 2010; Gudritienė et. Al., 2014a). It helps in the formation of thematic data sets and various maps (Gudritienė et. Al., 2014b). It is also possible to create the maps of protected areas with these data according to the results of the research. These maps may help solving environmental problems and might be used for the prevention of violations.

In order to preserve protected areas and to reduce their devastation, it is important to know the most common violations on these areas. The created map will provide information about areas where the damage occurs most often.

The Nemunas Loops Regional Park was selected for the research, in which the main aim was to identify the most common violations and the most problematic areas.

The objectives of the research: to carry out a detailed analysis of violations in the Nemunas Loops Regional Park and protected areas for 2007- 2014 period of time and to create a dot distribution map of these violations.

The main tasks:

- 1) to review the aim of the Nemunas Loops Regional Park establishment, prohibited and promotional activities,
- 2) to carry out the classification of violations in these areas during 2007-2013 according to Republic of Lithuania Code of Administrative Offences,
- 3) to group the violations of 2007-2013 according to the timing and to create a dot distribution map in order to provide its application possibilities.

Methodology of research and materials

Legal acts, books, scientific articles, foreign literature, statistical data were analysed, an interview with a specialist was carried out. The information was collected from the State Service for Protected Areas (www.vstt.lt), Land Information System (www.geoportal.lt), State Cadastre of Protected Areas.

The authority reports of violations of 2007-2014 in the Nemunas Loops Regional Park were analysed. The violations were grouped according to the year when they occurred and Chapter seven "Administrative offenses of environmental protection, natural resources, nature, historical and cultural monuments protection" of the Republic of Lithuania Code of Administrative Offences. Moreover, the analysis of cartographic material was applied. The violations were displayed on the map according to the addresses of areas using geoportal.lt website and ArcGis software package. A more detailed analysis was carried out for 2009 because the most violations were made during this year. The data analysis of this year was performed by grouping and presenting attributed data which were stored while creating a digital map.

The object of research is the Nemunas Loops Regional Park. This area was selected because of its purpose of establishment, areas of functional priority and a perfect geographical position. The Nemunas Loops Regional Park was established to preserve unique Great Loops of Nemunas, Punia landscape, its natural ecosystem and the values of cultural heritage in order to control and use it rationally. The main territorial planning document, which sets the measures to protect, control and use properly this unique Lithuanian territory, is the Nemunas Loops Regional Park planning scheme.

Results and discussion

The Nemunas Loops Regional Park was established in Lithuania on September 24, 1992, in order to preserve unique Great Nemunas Loops and Punia landscape, its natural ecosystem and the values of cultural heritage (Baškytė, 2006). The total area of the park is 25,095.6 hectares. The regional park is under the authority of the State Service for Protected Areas of the Ministry of Environment of the Republic of Lithuania.

It is forbidden in the park:

- to build and keep caravans and other portable items for accommodation, nutrition and other similar purposes;
- to drive motor vehicles off the road;
- to allow afforestation, construction of buildings, which may block the objects of heritage and damage the distinctness of it in the protected areas;
- to allow afforestation of agrarian land in conservation priority areas;

– to fence forests, lakesides, riversides, observation decks, educational paths, internal roads etc.

The buildings in the park can be projected, constructed, reconstructed and capitially repaired only when the projects are approved by the authority of the park.

The analysis of the data showed that during 2007-2013 period of time most of violations in the territory of the Nemunas Loops Regional Park were carried out against the requirements of protected areas and water protection.

A map of the Nemunas Loops Regional Park violations during 2007-2013 was created which highlighted the most problematic areas according to the year they had happened. The majority of violations repeating every year were recorded in Punia natural reservation and around it (Fig. 1).

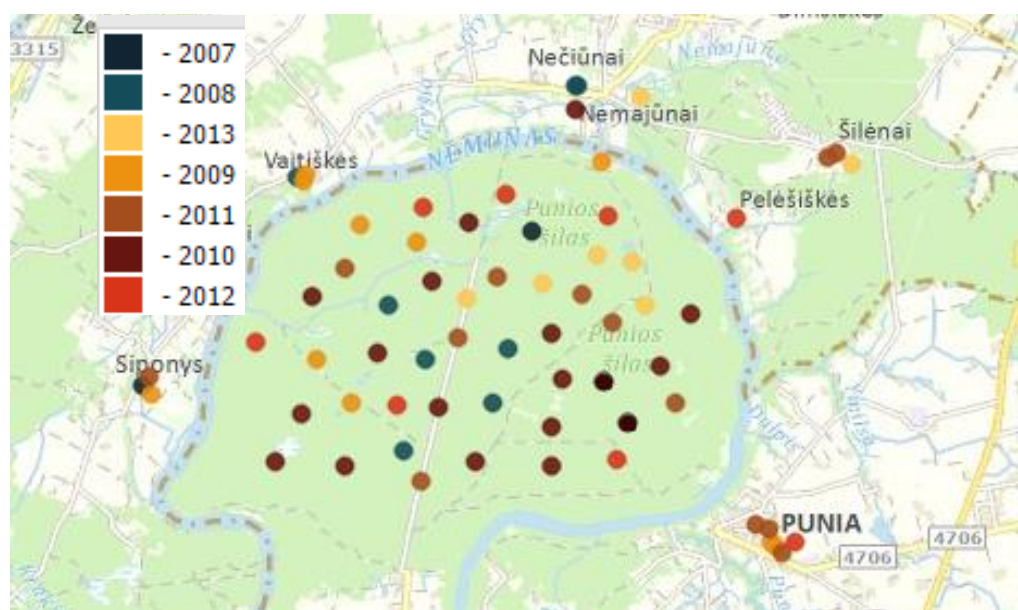


Fig. 1. The violations of Punia Natural Rezervation and around it during 2007-2013 period of time.

Moreover, 17 violations were carried out in Pociūnai during the period of 2007-2013 (Fig. 2). In this town the most common violations were against protection zones of water coastal areas and fishing regulations.

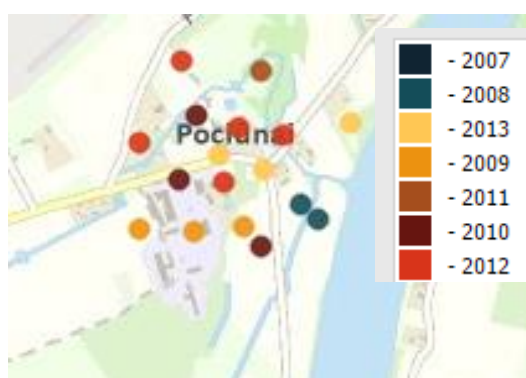


Fig. 2. Distribution of violations in Pociūnai in the period of time of 2007-2013.

The other area where violations have been repeating year after year is Birštonas. In this city 20 violations were carried out during the period of 2007-2013 (Fig. 3).

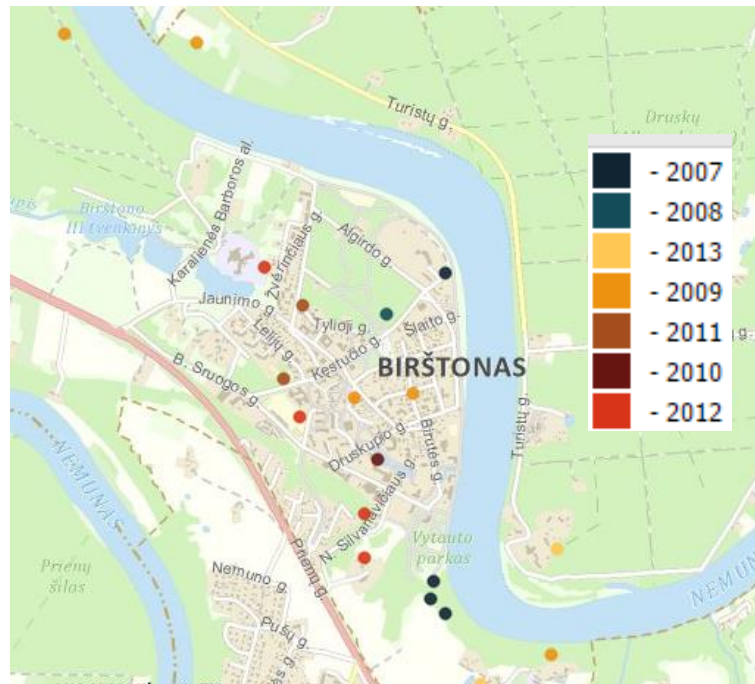


Fig. 3. The distribution of the violations in Birštonas during the period of 2007-2013.

7 violations were carried out in Balbieriškis town and more than a half of them were carried out in a year (2007) (Fig. 4).



Fig. 4. The violations in Balbieriškis town.

These kinds of maps are simple, well understood and informative. They can be created by specialists with ArcGIS program. If they do not have this software package, the map can be created by using tools of www.geoportal.lt

It is possible to create not only a graphical view but also to store the information about the analysed objects while creating the map. The map above in the attributive table stores the following: a year of a violation, the place and the nature of the violation. The filling of attribute information allows to group the data of each year separately. For example, there will be presented the violations of 2009 because most of violations were carried out in that year.

According to the code of administrative violations of law, the section of the seventh paragraph, almost half or 43% of the violations were carried out against the regulations of water protection (Clause 55). A quarter (24%) of violations were carried out against the regime of the protected areas. The rules of forest visiting violations represented 17 % of all violations in 2009. A little bit less, 12% of violations occurred against (Clause 78) protection and management of green plantation in non-forest land. Arbitrary destruction and cutting of trees and bushes in the state forest land happened only in 2% of cases, because this violation was carried out only once. Also, 2% occurred against the requirements of forestry and fire protection (Clause 77).

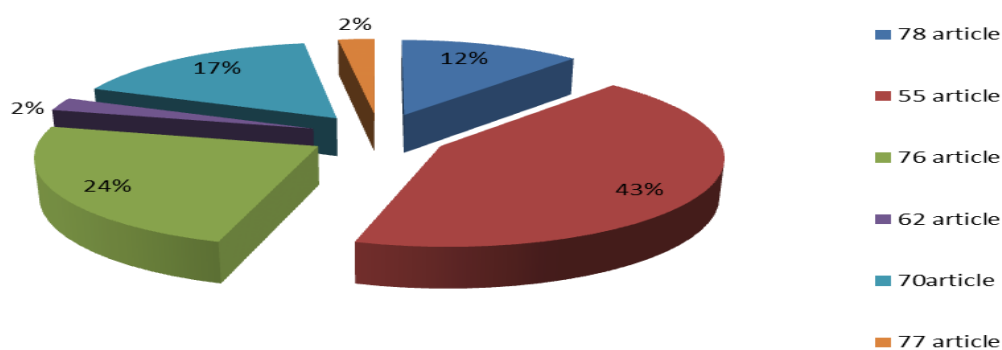


Fig. 5 The groups of violations in 2009 according to the code of administrative violations of law, the sections of the seventh paragraph.

The violations can be reviewed in a detail. It can be grouped according to the number of specific violations. The list of violations carried out in 2009 can be seen in the Table 1

Table 1

List of violations in 2009

The list of violations	The number of violations
Arbitrary pruning of trees in non-forest land	2
The violation of riverside security zone	2
The violation of park security regulations	1
Arbitrary cutting of trees in a forest land	4
Building a fence in the riverside security zone	1
Arbitrary tree pruning in non-forest land	2
Unauthorized excavation	2
Parking a car in the riverside security zone	8
A fireplace in forbidden area	4
Littering in the environment	3
Cutting down a tree in the riverside security zone	1
Driving a car where it is forbidden	2
Fencing forest	1
Arbitrary building mobile home	1
Careless behavior with fire in a forest land	1
Excavations in waterside protection zone	1
Arbitrary building of a wagon in the private area	1
Arbitrary building of hunting cabin, arbitrary moving of the sign of reservation	1
Cultivated land in waterside protection zone	2
Arbitrary building of summerhouse	1
Arbitrary felling of protected green areas in the waterside protection zone	1
In total	42

Quite common violation is a car parking in the water protection zone. In 2009 this happened 8 times. Arbitrary felling of trees in the forest land and making fireplaces in protected areas occurred 4 times. The pollution of the Nemunas Loops Regional Park got 3 warnings. The violations carried out 2 times are the following: arbitrary tree pruning in non-forest land, driving a car in the forbidden area,

ploughed and cultivated land in the coastal zone of water protection and arbitrary excavation. Other violations were detected one at a time.

Summarizing the results it was found that during the time period of 2007-2013 most of violations were carried out against the requirements of the protected areas (arbitrary constructed mobile homes; environmental pollution, the violation of visiting regime in nature reservation). Also, the violations of water protection requirements stood out (the car parked in the protected area of water reservoir, agricultural land, stored agricultural equipment which is not used etc.).

It was not possible to analyse the violations of 2014 the same way as the violations of 2007-2013. This is because the reports of violations were changed by the authority of the Nemunas Loops Regional Park. It was not required to indicate a specific violation and the location of it in the reports. It only indicated the sphere and the number of violations. For this reason violations of 2014 were not distributed according to the code of administrative violations of law, the section of seventh paragraph. Besides, the violations of 2014 were not included into the map. On the whole, during 2014 there were 34 violations. 41 % of it were carried out in the field of landscape and protected areas. 9 violations (26%) were recorded in the field of water protection requirements. 15% of violations were recorded against the rules of the forest. Unauthorised construction happened in 12% of violations. One violation (3%) was made in the field of fishing and air pollution.

230 various violations happened during the time period of 2007-2014 in the Nemunas Loops Regional Park.

Conclusions

1. Summarizing the results of the research it was found that during the time period of 2007-2013 most of violations were carried out against the requirements of the protected areas (Clause 76) (arbitrary constructed mobile homes; environmental pollution, the violation of visiting regime in the nature reservation) and the violations of water protection requirements (Clause 55) (parking a car in the protected area of water reservoir, agricultural land, storing agricultural equipment which is not used etc.).
2. The created a map highlighted the most problematic areas, in which the violations occurred every year. The majority of violations repeating every year were recorded in Punia natural reservation and around it, Pociūnai, Balbieriškis and Birštonas towns.
3. In 2014 the form of reports was changed and it did not let to analyse the violations in detail. It can be seen as a negative factor in this research because there were no accurate violations and areas. For this reason, the map was not created. It is known that 34 violations happened during 2014, which have been grouped into 6 groups: violations of use and visits of forests, fishing rules, landscape and protected areas, water, atmosphere and construction.
4. During the time period of 2007-2014 230 various violations were made in the Nemunas Loops Regional Park.
5. The created map may be used for prevention of violations as an additional material.

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