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Ristea, Alina Mihaela

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DYNAMIC ANALYSIS FOR THE MANAGEMENT OF STRAY DOGS IN BUCHAREST

Alina Mihaela RISTEA

Faculty of Geography
University of Bucharest
risteaalina@yahoo.com

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Dynamic analysis for the management of stray dogs in Bucharest

Alina Mihaela Ristea

Dynamic analysis for the management of stray dogs in Bucharest. The paper presents a new concept in Geography, with debates about the analyzed entities on many ways, such as journalistic or political. In the present case, I wish to adjust it to the geographic plan and to incorporate social-geography elements, elements relating to environmental issues, location being the most important component. Practically, complaints made by the capital's citizens against stray dogs, that are being received by the Animal Protection and Surveillance Authority (ASPA) in Bucharest, are standardised, brought to a common form and are introduced under a punctual form on a map at that address. From all this complaints, a data base with lots of information is built. Through processing, thematic and analytical maps result, which will represent the cartographic support of this research and all information will be examined both qualitatively and quantitatively.

Key words: dogs, distribution, GIS

Analiza dinamică pentru gestionarea câinilor fără stăpân din Municipiul București. Cercetarea prezintă un concept nou în domeniul geografiei, existând dezbateri legate de câinii fără stăpân pe mai multe planuri, cum ar fi cel jurnalistic sau cel politic. În cazul de față, doresc să o adaptez planului geografic și să cuprind printre altele elemente de geografie socială, elemente ce privesc problemele de mediu, cea mai importantă componentă fiind localizarea. Se va face referire la reclamațiile făcute de cetățenii capitalei contra câinilor vagabonzi și trimise autorităților responsabile. Informațiile din cadrul acestora au fost standardizate, aduse la o formă comună pentru a putea verifica repetitivitatea lor. Toate vor fi cartate la nivel punctual, rezultând astfel o bază de date importantă cu toate adresele reclamate, din care se pot extrage diferite detalii, se pot prelucra și interoga pentru realizarea de hărți analitice și tematice. Se propune o analiză cu relevanță atât calitativă cât și cantitativă, prin elemente descriptive, grafice și cartografice.

Cuvinte cheie: câini, distribuție spațială, GIS

1. INTRODUCTION

Throughout history, the concept of landscape has always been controversial. Urban landscape is defined by features, models and city structures. Thus, each urban landscape holds elements of similarity with others of the same type but and relevance by uniqueness and diversity.

Bucharest is defined by key structures, such as imposing buildings (Casa Poporului, The National Library), historical monuments (Arc de Triomphe), parks (Herăstrău) and many others. But at the social level and perception, the landscape is disturbed by stray dogs, them dividing people into two camps, the lovers and the haters. Large urban ecosystems are in an advanced state of contamination due to intense human activities taking place in them, leading to the generation of environmental disturbances [1]. But, regarding Bucharest landscape we can talk about disturbances of the environment because of the stray dogs. The term „stray dogs” means population of common breed dogs [2], who became a constant and worrying presence in the former Soviet Union and the Balkans, but also in Asia and South America.

Human attitudes to animals are a matter of central concern to the field of animal welfare [3]. The attitudes field is an open book with different relevance for individuals. But for general, we all know that negative attitudes to animals are associated with the vice versa behavior from them and the positive changes in people's opinions can generate an improvement in animal-related legislation and public policy [4, 5]. It's very important to understand origins of such attitudes and values, that can be described, according to Serpell by two motivational considerations, affect and utility. There are many researches for this issue, the most known is a survey developed in America, wich had the purpose to extract nine distinct attitude subscales [6,7,8]. Animals that are more close to humans and are more similar with them from the physical, cognitive and behavior ways, seems to evoke more positive affect than those that are distant or dissimilar [9, 10, 11, 12].

Thus, an increasingly disputed issue both in the capital and in the country is that of stray dogs, their increasing breeding leading to social and political issues.

For their sterilization or sheltering drawn complaints are needed to show the authorities the situation on the field (location, behavior, their number, and so on).

The objectives of this study include determining the locations where the urban landscape is affected by dogs, according to the complaints made, to establish areas with the biggest problems caused by them and the biggest "crowds", observation of positive and negative effects on population and the environment of free quadrupeds presence on the streets. Mapping will be done using GIS techniques.

Basically, the complaints made by citizens against the stray dogs that are received by A.S.P.A. (Animal Protection and Surveillance Authority) in Bucharest, are

standardized to a common form and are being introduced as a punctual form on the map of the area. Also, a data base is created with as much information as possible, from which, after processing, we obtain the analytical and thematic maps.

I think this is an important theme that concerns a current problem, which will solve in the near future. Through this study I hope to be able to contribute in a way or another to the new decisions regarding the quadrupeds' situation and to highlight the civic implication of population in a desire to solve this problem. The analyzed period is year 2011.

2. METHODOLOGY

Study area

The area for which the research is undergoing is known from the title, namely Bucharest Area. According to administrative boundaries, Bucharest, Capital of Romania, is spread over 285km², with a population of over 2 millions [13]. The municipality is divided into 6 districts, this delimitation offering a plus for the statistical and graphical representations, this ones being able to be analysed separately or combined, compared and structured.

In the Media there are more and more articles about stray dogs, people bitten by dogs, territorial problems, insalubrious places, etc. There are two main groups: those who want dogs' euthanasia and animal lovers who don't consider it necessary.

According to the law, from 12.03.2013, euthanasia is prohibited. The dogs that will be picked up from the streets and taken into shelters, will be able to stay there for up to 30 days, and if meanwhile they haven't been adopted or claimed, will remain in the shelter or will be returned to the place from where they have been taken. Dogs with "crotal" (metal marking affixed to the animal's ear to be recognized) and not aggressive, should remain in the shelters, but the main problem is the limited capacity of accommodation (A.S.P.A. has two shelters, Pallady and Mihăilești, totaling only about 700 places; several NGO`s have collected funds and built shelters, but insufficient for the approximately 60.000 dogs in Bucharest). Adoption is required; this is one of the solutions adopted to slowly get rid of the stray dogs.

The number of stray dogs is not a problem just in Bucharest or just in Romania. For example, in India are living 19 million stray dogs and in Bangalore there are over 200 000 stray dogs, about 10 dogs/km on the streets [14]. In Sri Lanka, a country that has 20 million inhabitants, there are about 3 million stray dogs [15]. In the country there are revealed a few cities where the stray dogs problem is under control such as Braşov, where it was completely eradicated, or Oradea, where in 2003 it developed a program supported by the successful sterilization of dogs [16].

From 12.05.2013 has been proposed a new stipulation of law, which says that people who feed stray dogs could be fined up to 5000 lei.

The most important measure is primarily reproductive control (sterilization). Sterilization campaigns are free, but the community involvement is needed in order to find those dogs that are not neutered. When a person makes a complaint is recommended that he/she specifies if the dogs have or don't have ear tag. The decision of placing a sanctioning measure was taken following the comments and proposals made by citizens for the project to amend Ruling CGMB 243/2009, on the control of breeding dogs in Bucharest. The project also stipulates that individuals and legal entities, as well as NGOs who have dogs older than four months in Bucharest are obliged to register them with ASPA, within six months from the date of entry into force of the decision, by microchipping and filling out a form.

Under the new project debate, the dogs can be adopted only by those who can provide proof of accommodation, food and medical assistance. The new forecasts take into account that individuals and legal entities or NGO's who abandon dogs may no longer have the right to adopt other animals for one year period.

Methods and data source

All the information received and quantified are from the Animal Protection and Surveillance Authority (A.S.P.A.) data archive, are real, all complaints being recorded, all of them having received a favorable or less favorable response from the responsible people within 30 working days, according to the law.

GIS techniques have evolved a lot, for the dogs' distribution and dynamics study in Bucharest, according to official data, using only open source software (Quantum GIS, uDIG, GrassGIS, Saga GIS, Gdal).

Since I started to study this theme, to read the complaints and to pin them on a map, i realized that the data base will be a complex one, with both personal data, less interesting for us geographers (them being useful for the authorities) and quantitative data. Thus, I created a list of attributes, so that each dot representing an address to be characterized by more information.

Following several introductions and implementation of buffer zones, it appears clearly on the thematic maps, most of the locations where complaints against dogs are, either because there are too many or they are aggressive, either because of vigilant citizens. About the concept of dogs aggressiveness, there are very important people's perceptions of harms and risks (to animals, humans, the environment, and so on) and the various ethical concerns raised by these harms and risks [17].

3. RESULTS

Data analysis was performed using GIS techniques, with open source software. Making thematic cartographic material is complex, representative for the study typology. It is a designed study with detailed extraction, processing and disclosing information because of the large number of elements arising from the placing database petitions.

The city residents complains were localized according to the steps described in the methodology. After finding in the base map all the addresses of petitions, the points were shared at district level to quantify the number of complaints and dogs applicants (relative quantitative analysis).

The database contains attributes of the layers, of which a part is confidential (can be used just for the A.S.P.A. institution interest, like the number of registration, the type of the complainant - private individual or legal individual, name of the complainant, the phone number) and the other one is available for public interest.

According to those available for public use, a set of cartographic material was realized to process them. The date of the complaint is one attribute that I analyzed (Figure 1). It should be borne in mind that the date of the complaint is the actual date when it was recorded at A.S.P.A.. So I chose to represent on maps the number of complaints submitted by citizens on a quarterly basis, forming four classes of 3 months of analysis, depending on the season. The main reason for choosing these categories was related to the breeding periods of dogs (although they breed all year round, the most active is in late winter, early spring). As a result, the quarters of 2011 shows that the first (January-March) is most active (740 complaints), followed by July-September (418) and April-June (404). The fewest complaints were received in October-December (285). One of the reasons why there are fewer complaints in December is the presence of the winter holidays, the holiday period for many people both in the capital and those of the A.S.P.A..

In both of these maps, as well as in the following ones, a low number of complaints is observed particularly from District 1, as citizens began to be aware of the Animals Police Service. That service is part of "General Directorate for Community Services" that deals with everything related to animals, both stray and with owners, so this is why the fewest complaints from ASPA are from this district. Only people who do not know about this service addressed here and they are redirected.

Another attribute from the data base refers to the way where the complain has been filed (because many people don't know about the existence of an authority that deals with dogs, they sent petitions to the city halls or police stations); under what form the complaint has been sent - personal, fax, e-mail, mail or phone. The numbers show a big density of complaints made by mail (1091 complaints, 59% from total). The e-mail

and the fax methods for deposit a complaint are quite related on statistics, they are used by over 300 persons each. It happens rarely for citizens to come to the center to complain, in the case studied the count is 80 people (valuing only 4% of the total calculated).

If the number of dogs is not specified in the complain, the mentioned address is entered on the map with a dog, because it is not known exactly, that's why the total number of dogs is largely subjective.

Thus, in 2011, 1847 complaints were quantified (Figure 2), representative of 3036 dogs, some of which are repeated addresses that may refer to the same dog/dogs. Most complaints, and also most dogs that bring problems were in the 6th District (712 complaints for 1203 dogs), followed by the 4th (318 complaints to 319 dogs) and the 5th District nearby (297 complaints to 642 dogs). So, the examples above refers to two attributes, the one for the control number of complaints and the one about how many dogs the applicant considered to be in that location, an estimated or even exaggerated number (Figure 3).

It is observed in some claims that the specified number of stray dogs was probably exaggerated. It is possible that people who multiply situation on the ground to do with the simple desire to attract more attention of the authorities to arrive at the scene and take them away. Certainly, there are also cases of diminishing reality. In 2011, there were 35 addresses where they stated over 10 stray specimens, 17 of which are in District 6 (for example Giulești Park, the Park near Polytechnic University and others), and 10 from de District 5 (such as Uranus, the college dorm from Panduri, bus station Rahova, the Financial Administration for District 5 and others). These two districts have the most complaints for many dogs, followed closely by District 4.

The rest would be divided as follows: 2 of the District 4 (Kindergarten Sânziana and Str. Mountain High), 2 of the District 3 (the college dorm from Pallady and Str. Foișorului), one of the District 2 (Emergency Hospital "St. Pantelimon") and 3 from District 1 (Str. Telescope, Office bailiff Somaldoc Paula Daniela from Str. Emile Zola, University of Agronomic Sciences and Veterinary Medicine of Bucharest from Bd Mărăști).

A count of 311 complaints refers on more than one dog, from the total of 1847. All those totalize 1638 dogs from the total of 3036, which means an average of 2 dogs per complaint.

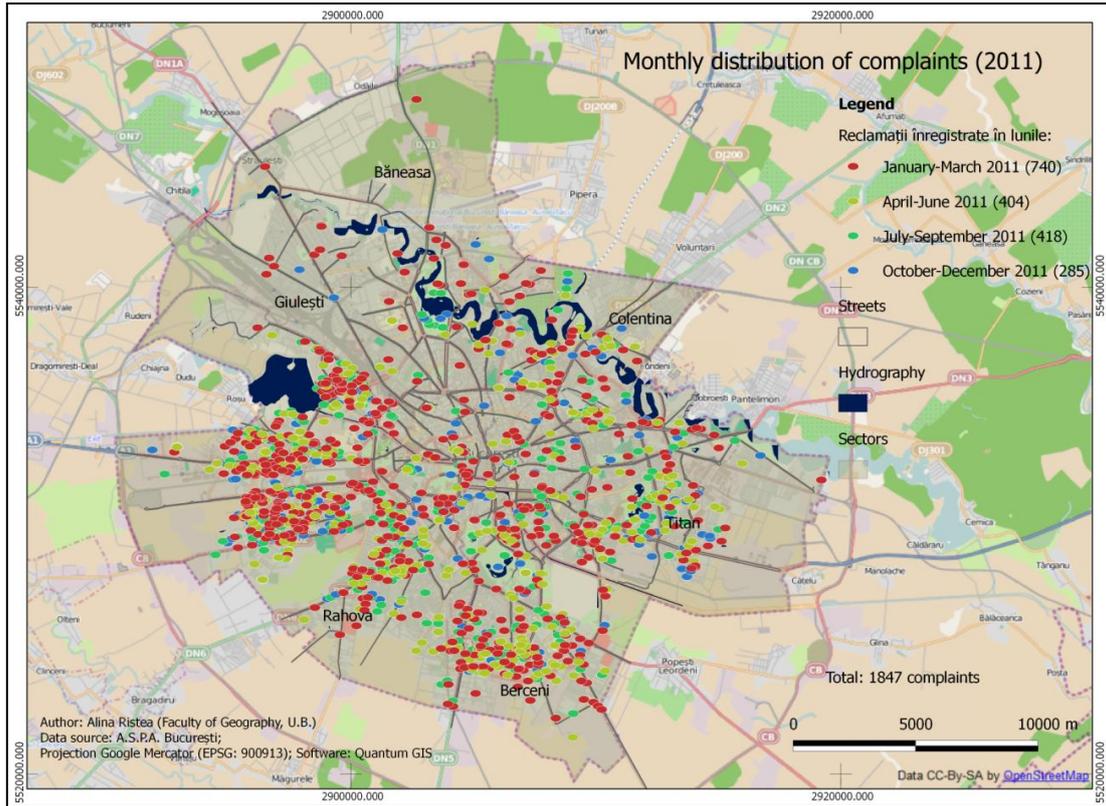


Figure 1. Monthly distribution of complaints (2011)

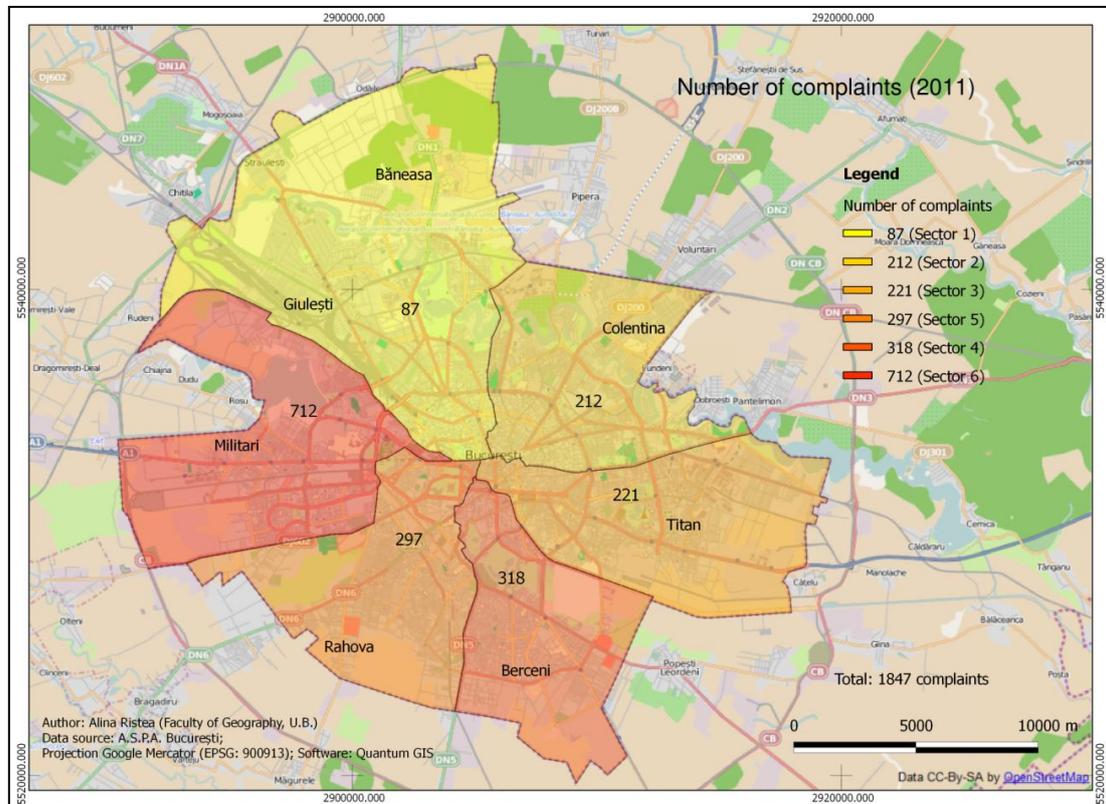


Figure 2. Number of complaints (2011)

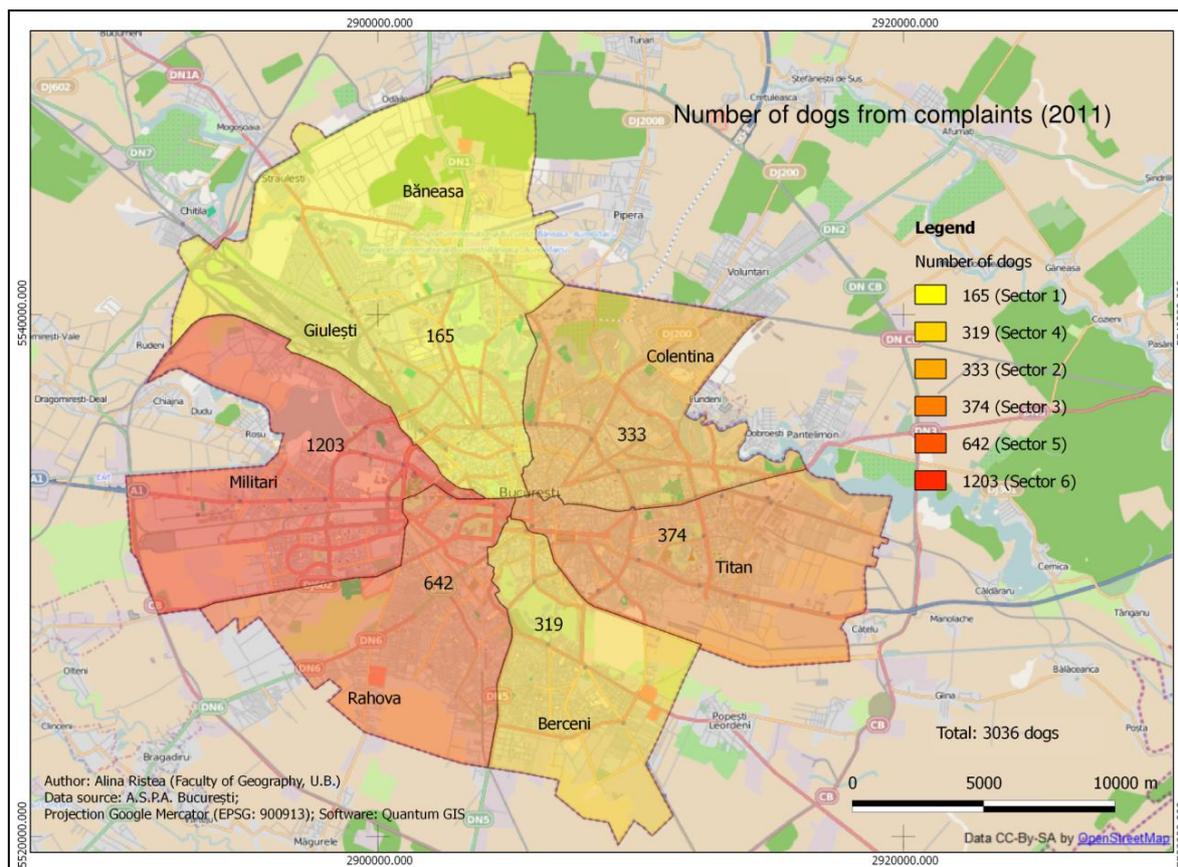


Figure 3. Number of dogs from complaints (2011)

A complainant may be a private or a legal individual. 413 complaints from private individuals and 1434 from legal ones have been introduced in the database. This analysis is valid for the type of applicants that demand directly to the A.S.P.A., in contrast to complaints filed by individuals for the City Hall, which are then forwarded to the proper legal institution. The legal entities can be governmental or private institutions. Governmental institutions can be: Bucharest City Hall (different departments); Local Police; Public Domain and Urban Development Administration; Bucharest Prefecture. It was noticed that District 6's City Hall is receiving the most annual complaints (Figure 4). This is normal, since this district is the most populated with complainants, and of course, with dogs.

In the cartographic material I located the addresses reported by residents, the quantification of the number of complaints and of the reported dogs (relative quantitative analysis), establishing areas with the biggest problems caused by dogs (according to the complainant's information) and the largest "crowds" (Figure 5). At a quick glance through the cartographic material, the first impression is that Bucharest is full of stray dogs. Dogs localized in the Crângași Park area were studied in the field by

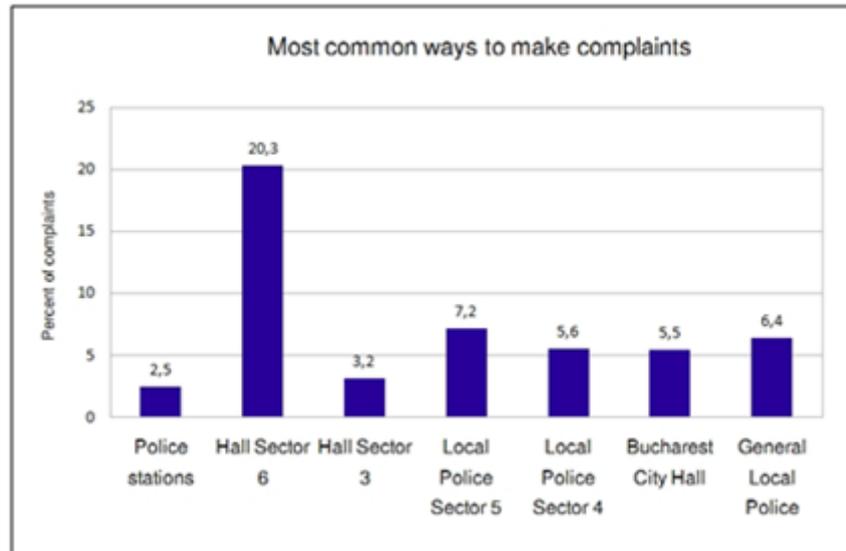


Figure 4. Most common ways to make complaints in percents (2011)

partially tracking their route. I tried to approximate a perimeter and an area in which they move, resulting in values of approximately 500 m for concentric circle radius. Dogs will often move in packs of at least 4-5 individuals. Those present in the area are marked with a "crotal", which means they are sterilized. Buffer zones were studied on a distance of 500 m for all complaints; virtually every point is the middle of a circle of radius 500. These areas were united as many adjacent points, so they give the impression of a full complex. However, as it has been seen in the other maps, the biggest problem is in District 6, in neighborhoods like Crângași, Drumul Taberei or Militari, but also in districts 5 and 4, in Rahova, Alexandriei, Ferentari, Progresu and so on. According to the information that the map presents, the territorial distribution of the crowds can be evaluated. This is influenced by a lot of factors such as people that feed dogs near their blocks, kids near schools and kindergartens that also feed them, people who take care of dogs and do not sterilize them and others. So most important nowadays is the education towards decreasing this phenomenon of stray dogs on the streets.

A gap was noted in the Văcărești street because this is the so-called "Bucharest Delta", the former Văcărești lake bed. Also, there are gaps in northern Bucharest, which belongs to District 1. Although the city center is meant to be a touristic area and arranged according to the petition, it is disturbed by the actions of stray dogs.

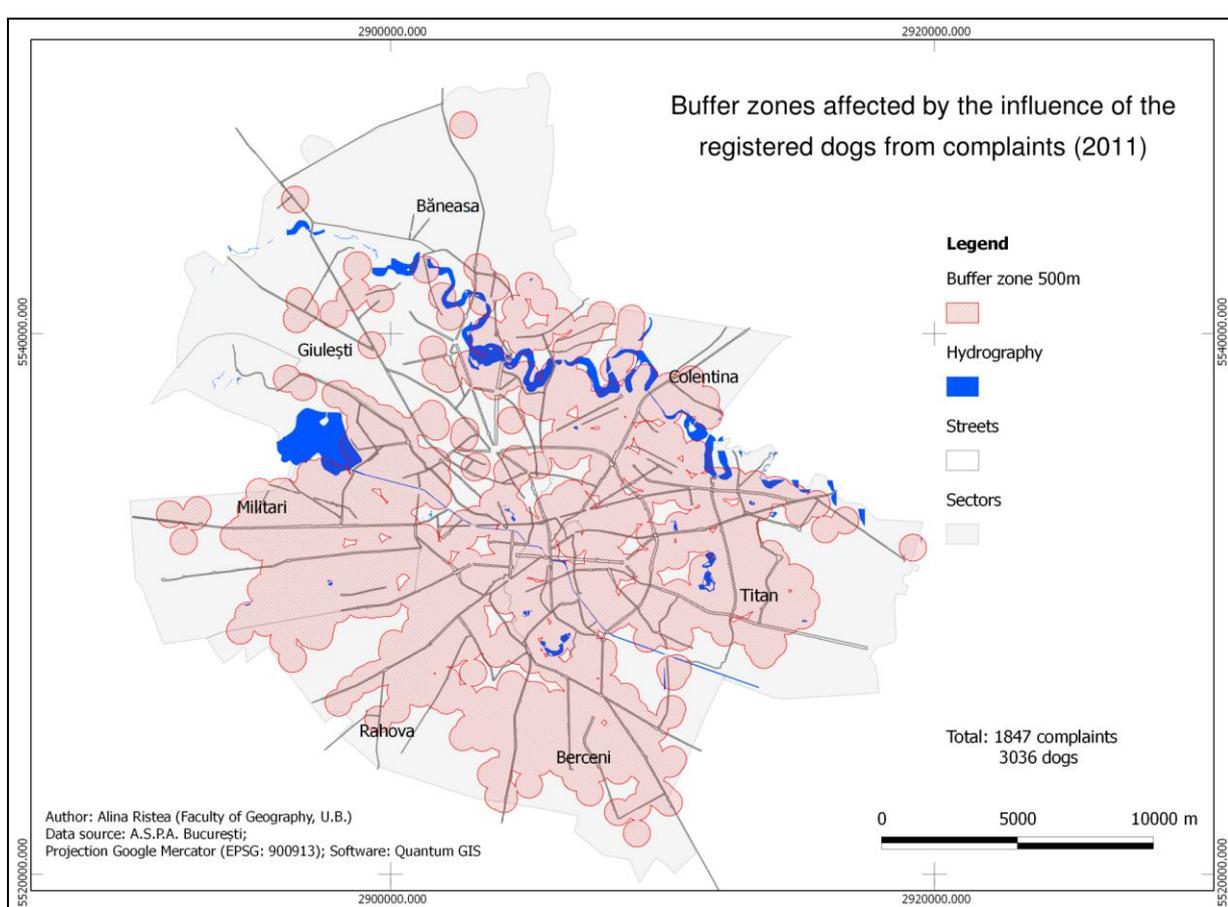


Figure 5. Buffer zones affected by the influence of the registered dogs from complaints (2011)

After several introductions and implementations of buffer zones, one can clearly notice on the thematic maps the locations where there are several complaints, either because there are too many dogs or too aggressive ones, or due to more vigilant citizens. Photos (from May 2013, except for those in the Vergului area, which are taken in January 2011) were made in some of the areas shown (Figure 6). Numbers refer both to the district itself and to the number of every photographed area (number 1 for Herăstrau Park, 2 for Circus Park, 3 for the Vergului area, 4 for Progresu neighborhood, 5 for 13 Septembrie area and 6 for Crângași neighborhood). They are taken for validating a part of the data that has been processed. It should be noted that during field trips for photographic material achievement I did not meet any aggressive dog. As it can be observed in the pictures displayed on the map, the dogs were very gentle and quiet. One exception was in Vergului area, District 3, where one of the photos was made to a group of dogs that were defending their territory and became agitated because of the camera.

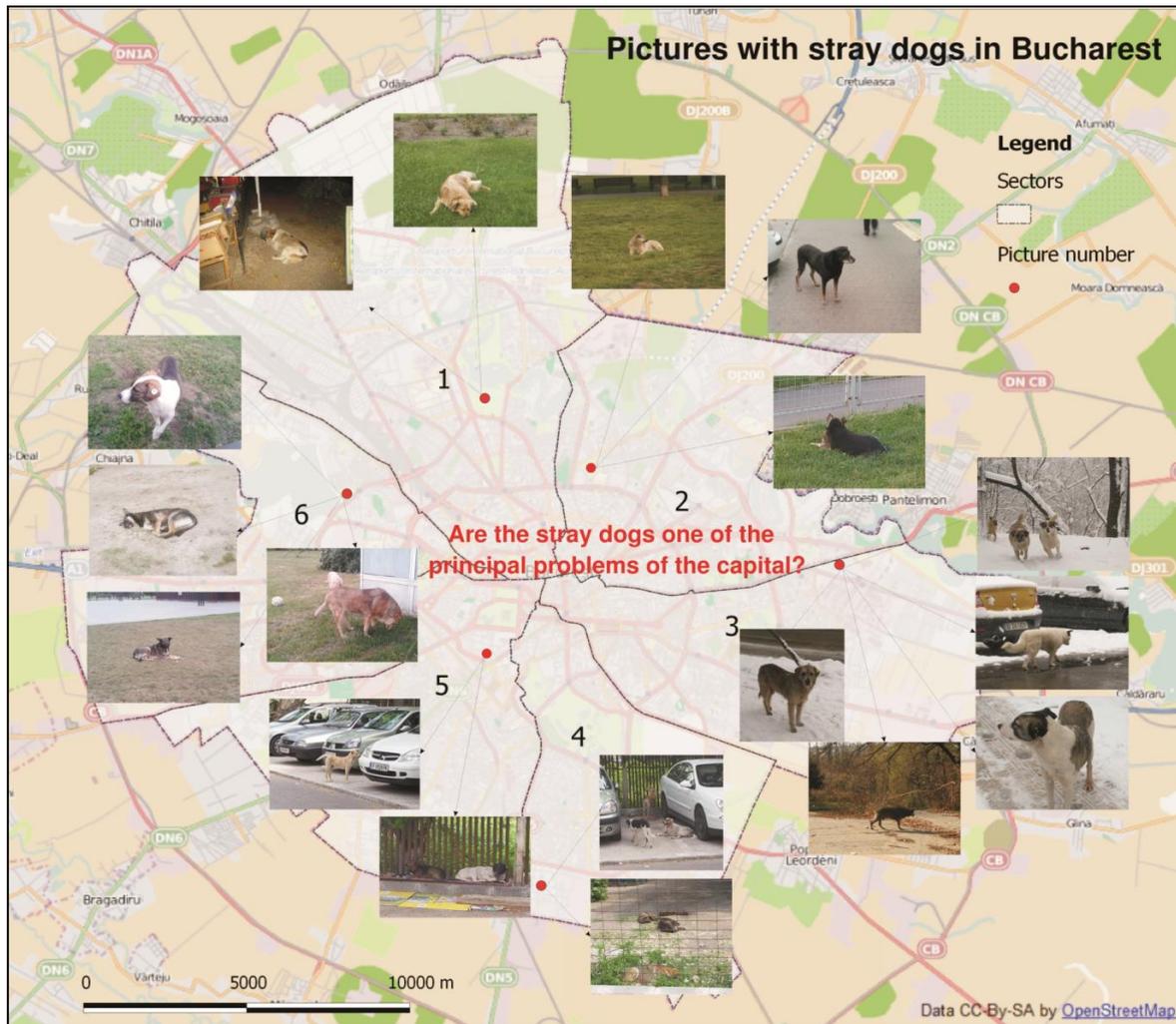


Figure 6. Map for pictures with stray dogs from the Bucharest's districts

A map of vulnerable areas has been made, where there are complaints against dogs (Figure 7). This cartographic representation uses pointed marks to indicate areas such as markets (for example Sudului, Crângași, Giulești, Moghioroș, Rahova, Ferentari, Bucur Obor, Progresu), parks (like Tineretului, Crângași, Moghioroș, Titan, Izvor, Herăstrău), schools (Marin Preda High School, Polytechnic University, School nr. 131 and nr. 148, Kindergarten nr. 169), central points (Aviatorilor, Victoriei, Dorobanți, Romană, Universitate), churches (Puișor, Ghencea-Lira), hospitals (Panduri, Universitar, Marius Nasta, St. Ștefan, Fundeni and Elias), and commercial places (Big Berceni, Carrefour Orhidea, Metro Militari, The Old Center, Mall Vitan, Marriot Hotel, Kaufland Sebastian and Kaufland Văcărescu), all of which have increased vulnerability. All those mentioned above are still valid today. Even if according to the new bills, dogs which were not adopted can be left in the same place from where they were captured (only after sterilization, vaccination, delousing and microchipping), considering that their return in the vulnerable areas is forbidden, they are still a cause of fears and insalubrities for the people.

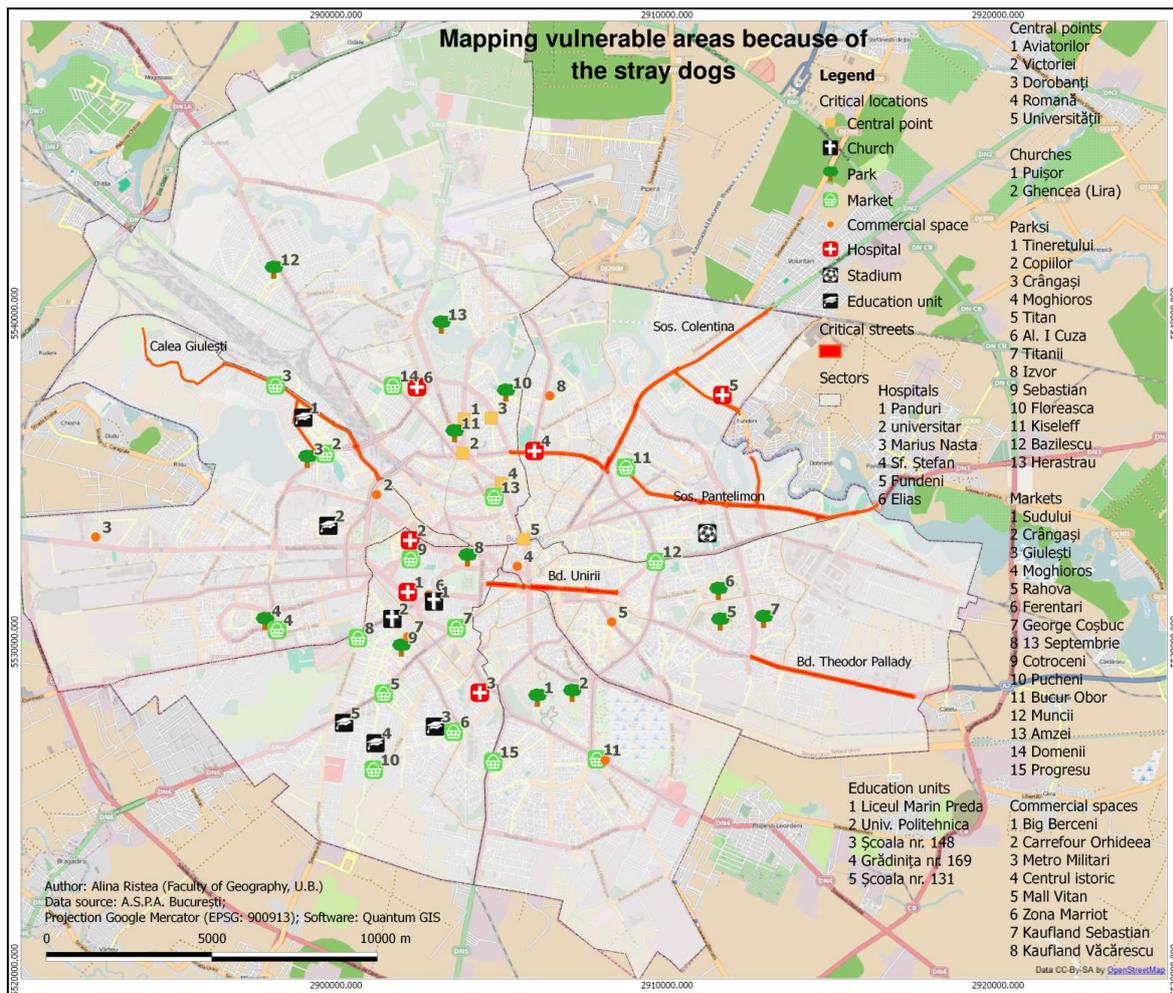


Figure 7. Mapping vulnerable areas

4. CONCLUSIONS

In the present study is been investigated from the quantitative and qualitative points of view, the situation of the stray dogs on the streets of Bucharest. The data used for studying and processing were gathered from formal complaints received by the Authority for Supervision and Protection of Animals during 2011. After analysis, it has been observed that complaints were addressed on a total of 1847 addresses in the capital, some of them being repeated for certain areas. It should be noted that there is an authority called "Animal Police" which deals with solving incidents regarding problems caused by stray dogs in District 1. This is why in the cartographic materials with database elements, the fewest complaints are coming from this district.

Monthly distribution of complaints was made quarterly, and it revealed that most of the complaints (740) were introduced in the first quarter (January-March). According to the cartographic material, it can be observed that the highest incidence of complaints is sourced by postal services (mail). Since the online media is now accessible, a software application could be developed, available for any person who wants to denounce their

indignation or any element that disturbs them. They can send in a complaint very quickly, can attach photos or other comments, besides the data that will be required for registering the petition.

The number of dogs from complaints is relative because when they are not specified, they receive a value of 1, although the complaining person can refer to more entities. The number for 2011 would be of 3036 individuals.

On the one hand, all the analysis can be used by the A.S.P.A. to have a database with local references, to know exactly where the addresses from the complaints are located throughout the capital. On the other hand, this type of research can help them to establish the main points of interest, to create routes of action when they are looking for dogs in the field. Should a complaint refer to a high risk of aggressive dogs, the institution's employees can check quickly the database for other similar complaints nearby, or what were the causes and solutions taken in the past for that particular kind of situation.

All ideas presented are feasible, as they can help in one way or another to solve problems related to stray dogs. Therefore, it should be regarded as a reliable analysis, not just for Bucharest, but also for other cities. Practically, every institution that tackles stray animals or other entities, needs a localized database. The methodology can be used in any other city that needs especially quantitative analysis of elements, with local or national results.

All in all, it can be said that for the urban landscape, stray dogs have become a symbol of the city and it is necessary to find an optimal solution for the common weal.

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