



TRANSFORMATION AND CONSERVATION OF PARKS ECOSYSTEM

**S. Sovhira, S. Lyulenko, G. Goncharenko,
O. Zadorozhnia, M. Kugai**

*Pavlo Tychyna Uman State Pedagogical University, Ukraine
ecler@bk.ru*

In the XXI century environmental crisis threatens nature more. As a result of pollution by pollutants and chemicals the climate of the environment has changed and result of this acid rain, water pollution, soil degradation, dyhresiya of forest ecosystems. Many areas have suffered from radioactive contamination because of the Chernobyl catastrophe. Toxic and radioactive substances, industrial waste, household waste are accumulated on land surface. Significant removal of fertile agricultural land for industrial or other building is continued. The number of drinking water per person is decreasing (according to UN data today about 1,3 billion people are not provided with drinking water either in qualitative or in quantitative aspect), rare species of plants and animals - are disappearing. Flora is very sensitive to changes of environmental factors and is a clear indicator of anthropogenic impact on nature. Plants are the most vulnerable from human activity, and taking into consideration the current state of the biosphere, plant's conservation is an important international complex task now [3].

Low ecological culture of holidaymakers leads to massive contamination of the environment with extrinsic products, and to its outright destruction.

The problem of leisure culture has great nature conservation value because each year the number of people who spend their free time on the nature grows extremely rapidly. Use of area for people recreation has become one of the kinds of economic activities [6].

All of this has a negative impact on the environment. In Ukraine it is increasingly difficult to find a natural area which can be considered as an ecologically clean and non-exposed by humans.

By definition of a park designer N. Shklenikenye, park is a particularly orderly environment, whose role should be defined as a cultural value, literary work and a tool that creates an attitude of a man to the nature and culture. Each park is like a work of art which reflects the moral and psychological ideal, spiritual face and society experience, idea content and aesthetics of life [5].

Parks enable a modern man to get into the atmosphere of harmony with the world, they are a source of emotional and spiritual stability. Ukrainian parks reflect the culture of the country. They are a form of preservation and development of national culture, yet the condition of its entry into the world community. Thus, if the parks are out of time, this is the time at which today should be the future.

A park, like any other ecosystem, is characterized by resistance to recreational pressures, dependent on many factors. If these loads are detected high, in a park biogeocenoses there are violated metabolic processes and energy, there is what we call recreational degeneration which starts from the ground and goes to the upper tier stand.

Park environment is the same living space, where man is in harmony with the environment, masters the skills of its establishmen studying the moral, spiritual, free society.

A modern park for a democratic society and improvement of social park building technology can become a center of sociocultural development of the population in the natural environment [1].

Aesthetic value of nature in spiritual formation culture examined such researcher as: O. Drobnyskyi, J. Jola, M. Roganova, I. Smolianinov, A. Shcherbo, L.Yuldashev, D. Hatskevych et al.

According to O. Kopyyevska, park culture is an integral part of leisure and rest of the population closely linked to general processes of culture and social life. Parks are important centers of sociocultural development of people of different ages, social status or nationality.

In the process of social development the architecture separated as an independent field of activity. Major foreign and domestic actors, such as F.Olmsted, E.Howard, M.Lurye, B.Colwyn, W.Disney, D.Likhachev, V.Gorokhov, I.Kosarevskyy, V.Lapshin, V.Bondar et al. studied the problem of preserving parts of nature in urban cities, their use for recreational, cultural and educational purposes [2].

With the development of transport and road lines parks are available for more and more people. If there are many people, but it's not quite a cultural holiday, the park may experience massive damage.

Communicating with nature in order to restore their forces, people create powerful pressure on it. Especially it is felt during amateur tourism which has dominated organized tourism.

All the consequences of human interference in the environment are divided into reversible and irreversible. Limit, where the qualitative change of the inverse process digression in irreversible, is called the limit of stability.

Recreational load is divided into harmless, harmful, critical, and catastrophic ones. Load is considered harmless when natural complex does not lose the ability to heal itself, it is not characterized by irreversible changes. Stability of the complex increases with the necessary steps to organize the territories [4].

At the present stage there are researches on the social and pedagogical tasks for amusement park which are worth paying attention.

In pace with the general directions we conducted our research on the territory of Ukraine in Monastyrshchenskiy region on the example of Podoskii park.

The reasons for the transformation of Podoskii park are as follows:

- building of a cafe on the park;
- increase of holiday-makers' influence;
- allocation of land for private development;
- various diseases of trees including mistletoe;
- not licensed cutting down of the park.

Another cause of degradation of Podoskii park is that its territory holds all holidays and ceremonies. Certainly the action of one person or a small group of people outside is barely noticed and everything restores to its original appearance. In mass influx of people self-healing processes is suspended. When a hectare park permanently places more than 10 people and dead wood resources are exhausted, the park thins on the eyes. In a usual park a group of 15-20 people can clog a hectare per day. According to our research, the limiting number of tourists in the park is 40-50 people per hectare. When loading 100 people per hectare, a park environment can be completely broken.

Mechanical effects of walking in the woods results, first of all, in soil compaction, and excessive increases of the number of visitors tramples forest herbs (Pyrola, Platanthera, Oxalis). A big influence is on broad-leaved forest (lungwort, anemone). As a result, forest herbs actually becoming less spread and in their place there are more resistant plants to trampling, adjusted to the more dense, dry soil forest - meadow grass (strawberry, grove veronica), and then the meadow plants (chamomile, yarrow etc.). In such places the soil is compacted in three times.

Upon further increasing of the number of tourists soil compaction increases at 6 times compared to natural one. Meadow grass can't stand it up as well. Most hardy weeds grow in their place (plantain, peas mousy, spores). This herb is difficult to be trampled even by horses, so it is called konotop.

Thus, on the first phase of destruction there are deteriorating conditions not for all plant species, but for the root plants.

As a result trampled down lots of soil become dry and lowered become over moist (primary form of erosion), living conditions of the soil microorganisms are deteriorated. According to the words of scientist A. Molchanov, "there would be no soil fauna and microorganisms, forest would perish from its own waste".

If the load on the natural object exceeds admissible norms, irreversible changes begin to occur: plants die, soil compacts, trees deplete, and forest degrades.

One of the significant factors of transformation of park cover is urbanization. It has a number of specific features and is manifested in the transformation of natural habitats or in their complete destruction. This leads to air pollution, which in several times higher than pollution of country areas, increase of concentration CO₂, heavy metals, radio nuclides, increase of electromagnetic fields tension, vibration, noise, changes of lighting and thermal balances, eutrophication of the aquatic environment etc.

According to G. Goncharenko and S. Sovhira' data one car in average gives off 1 kg of exhaust gas per day from which components such as CO₂ and a mixture of NO and NO₂ accounts for 30 g and 6 g respectively. Each car within the park area moves on average 10 min. Calculations of exhaust

gases that directly affect this ecosystem were carried out by determining the number of cars over certain time, which pass through the area, followed by mathematical processing of data.

Number of gas for 10 minutes, which is given off by one car is:

All gases - 6.93 g

CO₂ - 0,2 g,

Mixture of NO and NO₂ - 0.042 g.

Data of our study are shown in the table.

Table. Results of investigation of car exhaust gas number within park ecosystem

| | Period of investigation | Summer period | | | | Winter period | | | |
|---|-------------------------|-----------------------|--|---------------------|-------------------------|-----------------------|--|---------------------|-------------------------|
| | | Number of automobiles | Total number of gas emission for 10 min. of driving through (kg) | Mass of components | | Number of automobiles | Total number of gas emission for 10 min. of driving through (kg) | Mass of components | |
| | | | | CO ₂ (g) | NO, NO ₂ (g) | | | CO ₂ (r) | NO, NO ₂ (r) |
| 1 | 7.00-11.00 | 754 | 5,23 | 150,8 | 31,7 | 348 | 2,412 | 69,6 | 14,6 |
| 2 | 11.00-15.00 | 1618 | 11,21 | 323,6 | 68,0 | 870 | 6,029 | 174,0 | 36,5 |
| 3 | 15.00-19.00 | 1242 | 8,61 | 248,4 | 52,2 | 525 | 4,338 | 125,2 | 26,3 |
| 4 | 19.00-23.00 | 631 | 4,37 | 126,2 | 26,5 | 452 | 3,133 | 90,4 | 19,0 |
| | Total per day | 4275 | 28,42 | 849,0 | 178,4 | 2296 | 15,91 | 459,2 | 96,4 |

The analysis of table shows that heavy traffic is done around the studied ecosystem. This is due to the proximity of city Central Street, school number 1, machine factory, pharmaceutical factory.

The largest emissions of automobile's exhaust gas falls clearly in the summer period and in average is 28.42 kg per day (excluding night time), in winter - 15.91 kg per day.

Regarding the distribution of automobile's gas emissions in the area for day hours we came to the conclusion that the most intensive traffic is recorded from 11.00 to 15.00; regardless season and is from 6 to 11 kg of exhaust gases, which are given off into air.

Having analyzed quantitative content of CO and gas mixture NO and NO₂, we found that only during a day up to 850 grams of CO and 180 grams of hydrogen oxides are thrown off. Just these compounds adversely affect the vegetation of the studied ecosystem, and cause its gradual transformation.

The received data are presented in a scheme (Fig. 1).

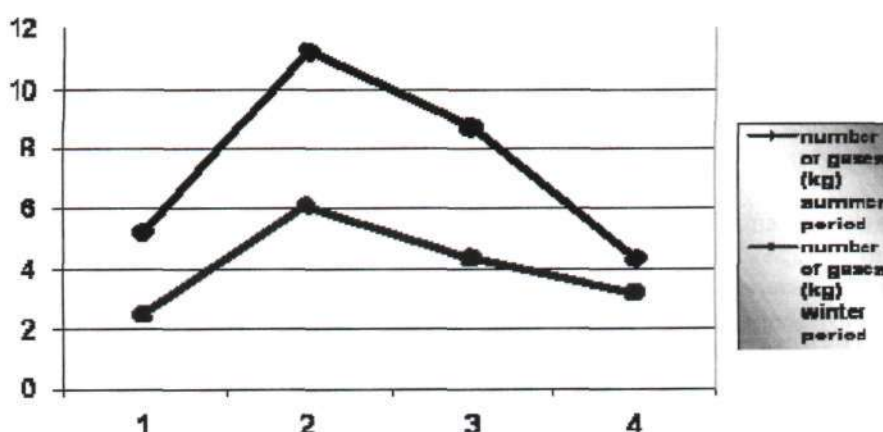


Fig. 1. Dynamics of exhaust gas emission by automobiles

These data confirm that level of exhaust gas pollution of park ecosystem is very high.

As a result, there are visual symptoms of affect on trees leaves with atmospheric toxins which occur in different species differently, depending on concentration, duration of toxic active substances effect. In most cases they look like a top or marginal chlorosis or necrosis of leaves, folding of leaf

plate, sometimes scattered necrotic spots or stains on leaf, total darkening, loss of turgor or premature abscission of leaves. Depletion of woody vegetation due to air pollution leads to settlement of these transformed landscapes with annual and perennial ruderal species.

Only with rational organization of nature management of this species we can harmoniously combine the interests of nature conservation and tourism, provide continuous and sustainable use and reproduction of recreational resources can.

For different types of natural systems maximum allowed load is defined.

The determined problems require urgent solution.

Main measures of forest and park environment protection are: their rational limited felling (with taking into consideration the environmental situation); planting new wood instead of felled; complete processing of timber and accompanying materials with the aim to increase the output of production per area unit; rational preservation of fruits, feeding, medical and technical plants; selection and seeds experiments for creation types of forest flora, which are more productive and resistant to diseases and environmental pollution; creation of forest belts to protect forest and water, creation of recreational and reserve forest and forest-park areas; fight with acid rain; improvement of ecological education and breeding conscious attitude of the population, especially youth, to the forest.

We solve this problem in providing public patrolling on park and forest areas involving pupils "school green patrol".

Now the question of restoration and preservation of Podoskyy Park due to its historical value is very urgent. There is the need for special protection of such natural objects as Podoskyy Park because for the last 10-15 years anthropogenic influence on some unique places of nature that weren't visited by many people in the past has intensified.

Podoskyy park, like all parks under democratization and improvement of social technologies of park construction, can become a center of socio - cultural development of the population in the natural environment that ensure expansion of ecosystem in Ukraine.

References:

1. Вергунов А. П., Горохов В.А. Садово – парковое искусство России.- М.:Культура, 1996.- 431с.
2. Генсірук С.А. Ліси – багатство і окраса землі. – К.: Наукова думка, 1980. – 211 с.
3. Лихачов Д. Поэзия садов. К. семантике садово – парковых стилей. Сад как текст.- М.:Согласие, ОАО «Типография «Новости», 1998.-356с.
4. Роганова М. В. Формування у дітей старшого шкільного віку ціннісного ставлення до природи засобами мистецтв: Автореф. дис. канд. пед. наук/НПУ ім. М. Драгоманова.- К., 2001.- 20 с.
5. Копієвська О.Р. Соціально – культурні аспекти організації діяльності парків в країнах зарубіжжя: Автореф. дис. канд. пед.наук/КНУКІМ, 1999.- 19 с.
6. Шкленікене Н.А. Теоретические основы планирования развития культурно – досуговой деятельности парков культуры и отдыха: Автореф. дис.. канд.. пед. наук/МИК.,-1992.-16с.