FOUNDATIONS OF PARKS-PEOPLE CONFLICTS

Problems of nature management conflicts on the example of national parks of the Ukrainian Carpathians

Andriy Romaniv
They extend in the northwest to the southeast for 280 km, and from the northeast to the southwest - for 100-110 km.
The Ukrainian Carpathians are mostly medium-altitude mountains, with predominant altitudes of 1000-1200 m above sea level, and the highest peaks reach over 2000 m, and among them Mount Hoverla (2061 m) - the highest in Ukraine. The main structural and orographic areas have a longitudinal extension from northwest to southeast and are divided by transverse river valleys. The area of the mountain system is 24 thousand square kilometers.
National parks and reserves of the Ukrainian Carpathians

In the mountainous part of the Ukrainian Carpathians are:
1 - biosphere reserve
1 - nature reserve
9 - national parks

The share of the area occupied by national parks and reserves within the Ukrainian Carpathians is 12.6%
National nature parks are nature protection, recreational, cultural-educational, research institutions of national importance, created for the preservation, reproduction and effective use of natural complexes and objects that have a special nature protection, health, historical and cultural, scientific, educational and aesthetic values (Law of Ukraine "On Nature Reserve Fund", 1992).

Functions of national parks:
- preservation of valuable natural and historical and cultural complexes and objects;
- creation of conditions for organized tourism, recreation and other types of recreational activities in natural conditions with observance of the regime of protection of natural complexes and objects;
- conducting scientific research of natural complexes and their changes in the conditions of recreational use, development of scientific recommendations on environmental protection and efficient use of natural resources;
- carrying out ecological educational work.
Types of conflicts in the national parks of the Ukrainian Carpathians

1. Disturbances in economic activity on the territory of national parks:
   • illegal deforestation;
   • construction of hydroelectric power plants on rivers;
   • cattle grazing within the protection zones;
   • poaching;
   • pollution of the territory (water resources, forest areas, soils).

2. Damage to the unique natural complexes of the territory due to natural disasters and dangerous physical and geographical processes:
   • windthrow and windsnap;
   • floods;
   • landslides.

3. Conflict of interests of nature protection and organization of tourist and recreational activities:
   • excessive tourist load on some natural sites
   • lighting fires, setting up tents outside the designated areas, disruption
   • trampling of rare plants, disturbance of animals rest, etc.).
The Ukrainian Carpathians are the most forested region of Ukraine. Here about 39% of the territory is covered by forests. The upper limit of the forest in the Ukrainian Carpathians passes on average at an altitude of 1500 m above sea level.

In the *subalpine zone* at altitudes of 1200-1500 m, 1650-1850 m thickets of mountain pine, juniper, green alder, East Carpathian rhododendron, common cereals and grass meadows are represented.

The *alpine zone* includes herbaceous and shrubby groups above 1800-1850 m
Intensive deforestation in the Ukrainian Carpathians is the main environmental problem of the region.

The main consequences of deforestation:
- Disappearance of unique plant groups, fauna;
- Violation of the hydrological regime of rivers, climatic conditions of the area;
- Intensification of natural floods that cause significant damage to the economy;
- Strengthening of windthrow processes in forests.
The public and journalists are trying to draw attention to the illegal deforestation in the Carpathians

In the programs of the central TV channels of Ukraine (TSN "Week", STB "Windows", "Channel 5", etc.) for the last 5 years were presented about a dozen stories about illegal deforestation in the Ukrainian Carpathians.

Among the official documents there is a letter from the Minister of Energy and Environmental Protection to the Minister of Internal Affairs of Ukraine regarding the need to investigate illegal deforestation of beech forests in the Uzhansky National Park (Letter dated January 20, 2020).

Example of a video about illegal deforestation in the Carpathians on the central TV channel (Link: https://www.youtube.com/watch?v=FCQ_f3Q_MBM).
Examples of established limits on deforestation (sanitary and other types of deforestation) within the national parks of the Ukrainian Carpathians for the first half of 2021 *(according to the Ministry of Ecology and Natural Resources of Ukraine)*

<table>
<thead>
<tr>
<th>Name of the national park</th>
<th>The area on which sanitary felling is conducted</th>
<th>Volume of wood to be produced, cubic metre</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARPATHIAN NATIONAL NATURE PARK</td>
<td>464,1</td>
<td>9997</td>
</tr>
<tr>
<td>HUTSULSHCHYNA NATIONAL PARK</td>
<td>52,3</td>
<td>642</td>
</tr>
<tr>
<td>SYNEVYR NATIONAL NATURE PARK</td>
<td>417,9</td>
<td>14779</td>
</tr>
<tr>
<td>SKOLE BESKIDS NATIONAL NATURE PARK</td>
<td>233,6</td>
<td>28146</td>
</tr>
</tbody>
</table>

In 2020, the State Ecological Inspectorate of the Carpathian District conducted 75 inspections of compliance with the requirements of environmental legislation on the use and reproduction of forest resources. 413 reports were drawn up, 413 people were brought to administrative responsibility for the total amount of fines of UAH 98,957 (approximately $ 4,000 USA), UAH 4,534,681 were accrued (approximately $ 168,000 USD of environmental damage).

37 inspections on the territories and objects of the nature reserve fund, 45 protocols were drawn up, 43 persons were brought to administrative responsibility for the total amount of fines of UAH 8,670 ($ 320 USA), UAH 584,945 ($ 21,665 USA) of environmental damage was accrued.
Consequences of windthrow processes in monodominant spruce plantations
II. The impact of the development of ski resorts on unique protected landscapes

In 2018, actions and scientific events aimed at banning the construction of a new ski resort "Svydovets" in the basin of the Chorna Tysa River, which provided for the construction of 230 km of ski slopes, construction of cable cars, hotel complexes and according to the planned documentation designed for daily service of about 22 thousand tourists.
The uniqueness of the landscapes of the Svydovets massifs.

In the area of construction of the tourist complex are protected areas: hydrological reserve "Apshinet"; ichthyological reserve "Chorna Tysa": natural monuments of local importance with populations of 42 rare and endangered species of plants and 51 species of animals included in the Red Book of Ukraine (detailed information by link: www.researchgate.net/publication/323113960 NATURE CONSERVATION VALUE OF THE CENTRAL SVYDOVETS MOUNTAINS UKRAINIAN CARPATHIANS). There are also natural sites of international importance "Emerald Network": "Eastern Svydovets" and the river Chorna Tysa - as part of the object "Marmaros and Chivchyny-Hryniavsky mountains" (Information about them is available on the website of the Council of Europe: [http://wab.discomap.eea.europa.eu/webappbuilder/app_s/27/](http://wab.discomap.eea.europa.eu/webappbuilder/app_s/27/))

Organizations that have sent letters against the construction of a tourist sports complex:

- Institute of Carpathian Ecology of the National Academy of Sciences of Ukraine (letter March 26, 2018);
- National Ecological Center (letter dated April 11, 2018);
- International Charitable Organization "Ecology-Law-Man") (letter dated 04.04.2018);
- International Institute of Human and Globalistics "Noosphere" (letter dated April 5, 2018);
- Scientists of higher educational institutions of Ukraine, scientific institutions (39 people, letter dated March 31, 2018)
III. Consequences of construction of mini-hydroelectric power plants on small rivers of the Ukrainian Carpathians

With the introduction of a "green tariff" for small (up to 10 MW) energy in Ukraine, the problem of preserving particularly valuable natural rivers has become especially acute. To date, about a dozen environmentally harmful small hydropower projects have been implemented, while it is planned to build more than 500 small hydropower plants in the Carpathians alone. At the same time, the share of electricity generated today by more than eight dozen small hydropower plants in Ukraine is extremely small (0.6% in 2019), and the negative consequences are significant.

The main problems of construction of small hydropower plants:

• Destruction of natural rivers, landscapes, rare and endangered species of animals and plants protected in accordance with Ukrainian and international legislation;
• Negative changes in the hydrological regime of rivers and surrounding areas, problems with water supply;
• Social conflicts related to the destruction of landscapes and rivers by developers, which are the basis for the development of local communities - for example, the field of "green tourism";
• Numerous violations of the law in the design and construction of small hydropower plants, which lead to conflicts with the local population, social tensions and mass actions of civil disobedience;
• The territories within which mini-hydropower plants have been built are deprived of recreational potential, green tourism is not able to develop here, such settlements (mostly) and rural communities are doomed to stagnation.

Over the last decade, there have been conflicts between local communities and environmental activists against the construction of small hydropower plants in the upper reaches of the Prut and Chorny Cheremosh rivers, which would affect the natural landscapes of the Carpathian National Park and destroy the most popular rafting area.
The position of the WWF in Ukraine on the development of small hydropower:

- Allocation of especially valuable river areas, where the construction of hydropower plants will be prohibited, guided by the basin principle of water resources management, in particular:
  
  a. on the rivers protected in the objects of the nature reserve fund of Ukraine (NPF) and other protected areas (in particular, Ramsar sites), within the projected objects of the NPF, as well as on the lands reserved for the creation of nature protection objects,
  
  b. habitats of rare and endangered species of fauna and flora, protected by the provisions of the legislation on the Red Book of Ukraine, the Green Book of Ukraine and international environmental regulations to which Ukraine is a party (biodiversity centers).

- The list of such sites is developed by the Ministry of Ecology and Natural Resources of Ukraine together with the leading profile scientific institutions of Ukraine, nature protection and ecological public organizations, ecological community.

- Ensuring the development of hydropower in areas not included in the list of particularly valuable river areas, based on the principle of basin management of water resources, provided that it does not have a negative impact on protected areas. It should include a national program for the development of small hydropower, indicating the sites on which hydropower is possible. Such a program must pass the environmental review procedure.

- Certain hydropower projects must pass the procedure of mandatory state environmental expertise and can be implemented only if there is a positive conclusion.

- Business access to the construction and operation of hydropower plants in the areas defined by the national program must be provided on a competitive basis, with mandatory access of the public and journalists, and must be announced in advance in the state press.

- Introduction of additional environmental criteria for granting a "green tariff" to small hydropower enterprises (small mini and micro HPPs), in particular, the criterion of territorial location with a ban on granting a "green tariff" to new and rehabilitated power plants located within particularly valuable river areas.
Especially valuable river areas of the Carpathian region of Ukraine within the nature reserve and other protected areas
IV. The impact of agricultural activities on the protected areas of the Ukrainian Carpathians

Slopes of the south-western exposition under agricultural lands, secondary meadows, beech-hazel thickets on brown and sod-brown earth loamy soils. (Valley of the Tereblia River near the Synevyr village, Synevyr NNP)
Degradation of alpine meadows and subalpine shrub Carpathians cover under the influence of long-term grazing of cows and sheep

Chornohora massif

Polonyna Krasna
V. The impact of mass tourism development on the natural complexes of the Carpathian national parks

Mass ascents to the highest peak of Ukraine - Hoverla (Carpathian NNP)

Unauthorized placement of tents in the area of the alpine lake Nesamovyty (Carpathian NNP)
Classes of resistance of natural complexes to recreational loads in mountain conditions of the Ukrainian Carpathians (The lowest resistance of natural complexes is estimated by the fifth class of stability, the highest - by the first)

<table>
<thead>
<tr>
<th>Evaluation factors</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The steepness of forested slopes with a predominance of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mountain pine, green alder</td>
<td>25°</td>
<td>16-25°</td>
<td>11-15°</td>
<td>6-10°</td>
<td>0-5°</td>
</tr>
<tr>
<td>spruce in the mountains</td>
<td>30°</td>
<td>26-30°</td>
<td>21-25°</td>
<td>11-20°</td>
<td>0-10°</td>
</tr>
<tr>
<td>fir</td>
<td>35°</td>
<td>31-35°</td>
<td>26-30°</td>
<td>16-25°</td>
<td>0-15°</td>
</tr>
<tr>
<td>beech</td>
<td>40°</td>
<td>36-40°</td>
<td>31-35°</td>
<td>21-30°</td>
<td>0-20°</td>
</tr>
<tr>
<td>Soils</td>
<td>Suspended peat</td>
<td>Mountain podzolic</td>
<td>Storms are low power</td>
<td>The storms are medium-power</td>
<td>Areas with characteristics listed to determine other resistance classes</td>
</tr>
<tr>
<td>The degree of skeletality of soils</td>
<td>Rocky screes, outcrops of native rocks</td>
<td>Surface-stony</td>
<td>Strongly skeletal (except turf)</td>
<td>Medium-skeletal (except turf)</td>
<td></td>
</tr>
<tr>
<td>Degree of erosion</td>
<td>-</td>
<td>Heavily washed away and with disturbed soil cover due to economic activity</td>
<td>Medium-washed, areas of fires, continuous windbreaks</td>
<td>Weakly washed</td>
<td></td>
</tr>
<tr>
<td>Planting</td>
<td>-</td>
<td>-</td>
<td>Young animals up to 3 m tall</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>Wet hygrotopes</td>
<td>Raw hygrotopes</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Categories</td>
<td>Hayfields</td>
<td>Mountain meadows beyond the upper limit of the forest (on mountain soils), open crops, felling</td>
<td>Secondary forested areas (gaps, meadows in the area of forest distribution)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sanitary condition (healthy trees)</td>
<td>less35%</td>
<td>13-55%</td>
<td>56-75%</td>
<td>76-90%</td>
<td>Over 90%</td>
</tr>
</tbody>
</table>
### The main features of determining the stages of recreational digression

<table>
<thead>
<tr>
<th>Stages of digression</th>
<th>Recreation rate (k, %)</th>
<th>Condition of grass and moss cover and forest litter</th>
<th>The state of the stand, undergrowth and undergrowth</th>
</tr>
</thead>
<tbody>
<tr>
<td>I stage (undisturbed landscapes)</td>
<td>5</td>
<td>The grass and moss cover is unchanged and corresponds to the type of forest. The bedding is undamaged</td>
<td>Undergrowth and undergrowth meet habitat conditions and are intact</td>
</tr>
<tr>
<td>II stage (undisturbed landscapes)</td>
<td>6-9</td>
<td>The grass and moss cover are slightly damaged. The tier of the cover is preserved.</td>
<td>Trees, undergrowth and undergrowth in satisfactory and good condition</td>
</tr>
<tr>
<td>III stage (conditionally disturbed landscapes)</td>
<td>10-29</td>
<td>Grass and moss cover is damaged over a large area. Weeds or meadow grasses, which are not typical for habitat conditions (ruderal plants), are typical.</td>
<td>Preserved undergrowth is poorly differentiated. There are almost no seedlings of native forest-forming species.</td>
</tr>
<tr>
<td>IV stage (severely disturbed landscapes)</td>
<td>30-59</td>
<td>Grass and moss cover degrades. Phytomass and the number of ruderal plants have sharply increased. Litter in the stage of destruction.</td>
<td>Alternation of undergrowth curtains and little viable undergrowth, limited by meadows and paths.</td>
</tr>
<tr>
<td>V stage (degraded landscapes)</td>
<td>60-100</td>
<td>The grass and moss cover typical of the forest vegetation conditions of the site has degraded. The phytomass and the number of ruderal plants are much larger than the forest ones, which have survived only near tree trunks. Litter in the stage of complete destruction.</td>
<td>Undergrowth and undergrowth are almost completely absent. The fullness of the stand decreased sharply. Trees have mechanical damage, dry up. In many trees, the roots are bare and protrude.</td>
</tr>
</tbody>
</table>
The first stage of research in the park to plan various activities, the establishment of its protection zones is to establish the landscape structure of the territory - the allocation of natural-territorial complexes that differ in rock composition, steepness and exposure of slopes, soil and vegetation.

With the purpose of focusing attention on the recreational function of national park, landscapes were probed from the landscape recreational potential point of view. Landscape recreational potential is the expression of total combination of possibilities of separate landscape elements to provide the realization of recreational function including spatial and sentinel and normative limitations and alternatives of nature usage.
Landscape approach to the coordination of protecting and recreation functions expects the realization of such exploratory work stages:

- Acquaintance with the projects and National Park’s reports; with meteorological service data; with materials of Land Resources Management Department; and with the results of the cosmic survey of the territory.
- Study of the published and cartographic information sources.
- Preparation of form documents for the field studies; construction of the actual material map; deciphering of cosmic pictures; construction of the hypothetical landscape map and specification of the field studies area.
- Field landscape surveys; study of the tourist routes, their technical conditions, recreation infrastructure of the park, unique and valuable objects, areas with injurious physic-geographical process.
- Study on location the recreation load on the key areas.
- Formation of the basic landscape map and its legend.
- Study of the natural territorial complex stability to recreation load. Determination of the recreation load parameters and recreation capacity of the territory.
- Analytical-synthetic data processing with GIS-technology usage. Formation of maps series of landscape units’ attractiveness for miscellaneous types of recreation on the base of landscape map.
- Motivation of the offers on recreation optimization in the park: Improvement of functional zoning, changing of the network of tourist routes, arrangement of the new infrastructure objects etc.
On the basis of the landscape map further determine the resistance of landscapes to recreational loads, the norms of recreational load.
Taking into account major factors of complex natural boundaries with the different degrees of fitness for every type of recreational nature usage were determined: most suitable, suitable, relatively suitable, limitedly suitable, little suitable. Map schemes built on the basis of findings allowed to select those kinds of recreation which are distinctly tied to the areal elements of territory (agrotourism, balneological treatment) and linear objects (water, touring by a car), and those for which sufficient landscape recreational potential on all of the park territory (pedestrian, ski, equestrian, bicycle, health tourism).
Territorial structure of landscape-recreation potential

To define, as far as optimum different types of recreational activity can be combined in space, typification of complex natural boundaries is offered on the indexes of fitness to the complex of types of recreational nature usage. As a result of superposition of maps of the possible recreation loading and map of quality of landscape recreational potential the figure 1 is got. On territory of park 5 types of naturally territorial complexes were selected among which most favorable are polirecreational naturally territorial complexes with the most suitable and suitable landscape recreational potential for more than three types of recreational nature usage. Such zoning combines quantitative and qualitative parameters and gives the picture of integral estimation of landscape recreational potential of the park territory and possibility of its use. As a result of superposition the territorial structure of landscape-recreation potential and the scheme of actual functional zoning is possible to discover a zones of discoordination of protecting and recreation functions in national parks.
The basis of the management of the National Park is the functional zoning of its territory, which should also be carried out on the basis of landscape research of the territory.

Within the national parks of Ukraine, the Law of Ukraine “On the Nature Reserve Fund” provides for the allocation of the following zones:

- **The protected area** is designed to protect and restore the most valuable natural complexes. Any economic or recreational activities are prohibited on its territory.

- **Protective (regulated recreation) zone** is a zone within which short-term rest and rehabilitation of the population, inspection of especially picturesque places is carried out. The arrangement and equipment of tourist routes and ecological trails is allowed in this area. However, deforestation and other activities that may adversely affect the condition of natural-territorial complexes and facilities in this area are prohibited here.

- **The stationary recreation zone** is designed to accommodate hotels, motels, campsites and other facilities for visitors to the park.

- **Economic zone** is a zone within which economic activity is carried out, aimed at fulfilling the tasks assigned to the park. Economic activity must be carried out in compliance with the requirements of environmental protection.
FUNCTIONAL ZONING NATIONAL PARKS
(A-Carpathian NNP; B - Synevyr NNP)

The system of zoning allows to prevent a number of conflicts in national parks.
CONCLUSIONS

• Conducted landscape research in combination with a detailed study of vegetation and fauna allows you to properly plan the zoning of the national park, which will help avoid a number of environmental conflicts and ensure sustainable and balanced development of the territory.

• Some conflicts can be avoided by strictly adhering to the legal norms of the current legislation. At the state level, legislative norms should be improved and the responsibility for compliance with environmental legislation should be strengthened.

• In order to avoid negative impact on the natural landscapes of national parks, they should occupy an entire territory (rather than individual isolated massifs), and buffer protection zones should be established along their perimeters.

• Conflict of interests of nature protection and tourist-recreational activity is possible in the following ways:

• Restriction of access of tourists to especially valuable territories;
  • Creating conditions in the park for possible deconcentration of the tourist flow within the territory and reducing the load on certain natural objects, and in case of impossibility to equip the tourist infrastructure, which would minimize the impact on the environment in particularly popular destinations.