Our analysis has proved that such types of pollution can be caused by hydraulic fracturing. For that matter, seismic activity turns out to be of particular relevance as it has already been proven that hydraulic fracturing can trigger earthquakes.

As for water pollution, we have experientially come up with the conclusion that during the extraction process, water is contaminated with methane and radioactive elements that are washed out of the host rocks.

In terms of air pollution, it is caused by the release of methane and other gases. At the same time, the fracking process is always accompanied by noise pollution.

Another significant issue here is land use. Shale oil extraction leads to disturbance of the landscape, damages agricultural land due to the use of a large area by the deposits.

Togetehr with this, soil contamination should also be taken into consideration as there is always a risk of toxic fluid leakage from sumps and uncontrolled fountain emissions.

Speaking about climate impacts,emissions of methane and other gases from shale oil production are higher than from conventional oil production. The damage to the climate is commensurate with the damage caused by coal mining.

To deal with the above, we have developed certain conceptual approaches to green environmental management: a) improving the legal framework; b) strengthening responsibility for non-compliance with laws and environmental standards; c) development of public environmental thinking; d) improvement of extraction technologies.

References:

1.Meehan P. Getting to Green: Environmental Management and Sustainability: An Introduction. NY, 2015. 160 p.

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MANAGING FORESTS IN SKOLE BESKYDY NATIONAL PARK: CHALLENGES AND STRATEGIES

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Forest management practices that could be deemed as sustainable involve the rational and balanced use of forest resources, with a particular focus on mountainous landscapes that have diverse environmental conditions. This approach

aims to ensure that the forest's ecological balance is maintained while allowing also the responsible use of its resources. The sustainability of forest management practices is critical to the long-term health and viability of forest ecosystems. Adopting sustainable forest management in mountainous landscapes means a sustainable, rational, ecologically balanced reproduction and use of forest resources in areas characterized by a wide variety of environmental conditions.

In this study the main problems of sustainable forest management are examined, and they include: massive drying of European spruce, increase in the magnitude of windfalls and windstorms, considerable recreational pressure on the most frequented tourist routes, jeeping and proliferation of non-native species.

Massive drying out of European spruce in the park is caused by multiple factors including anthropogenic and abiotic influences. Researchers have identified two ecologically specific groups of spruce forests in the park, with one group affected by unfavorable thermal factors and the other by unfavorable soil conditions. Additionally, the natural regeneration of spruce is hindered by the sodification of soil and compacted litter from wild blackberries. The causes of the drying out are complex and include the mass cultivation of spruce outside its natural range, cultivation of pure spruce plantations, reduction of plantation completeness, and the effects of climate change [1].

Increase in the magnitude of windfalls and windstorms leads to the increase in damage, and consequently, to the accumulation of dead wood, which provides a breeding ground for pathogens and insects such as bark beetles, particularly the typographical bark beetle (Ips typographus). Warmer temperatures can lead to increased development of these beetles, which may result in more frequent outbreaks. To mitigate these effects, forest management practices such as selective sanitary felling, clutter removal, and preventative measures against pests and diseases can be implemented [3].

Considerable recreational pressure is being put on the most frequented tourist routes. Natural ecosystems suffer from destructive changes when tourism is not properly regulated. It is estimated that around 100,000 people visit the area annually. To preserve the environment and ensure an adequate level of service, it is necessary to regulate visitor flows [3].

Jeeping tends to be the growing issue, as the environment is greatly impacted by off-road vehicle races in natural areas, leading to destruction of national parks, protected areas, and rare species of plants and animals listed in the Red Book of Ukraine. This results in rapid degradation of natural landscapes and increased susceptibility to erosion due to foreign plant introduction. Although such activity is illegal, the regulations in Ukraine are not fully established, and require further research to improve preventative measures against this harmful activity in the parks.

As for proliferation of non-native species, we must state that only some invasive species are currently being studied, with no national-level monitoring or quarantine measures in place to prevent harm to natural ecosystems. Controlling

and combating invasive species is regulated inconsistently by current legislation. Detailed research is needed to monitor the spread of invasive alien species in parks, which are particularly susceptible to climatogenic changes. Such changes create new niches and affect the functioning of ecosystems. It is important to consider the diverse use of renewable natural resources for various purposes, such as viewing forests not only as a source of timber, but also as a tool for climate formation, recreation, and social purposes. This is particularly important for protected areas.

Today, one of the main priorities in natural resource management is the implementation of effective and sustainable forestry practices in National Nature Parks (NNPs). These areas, characterized by unique flora and fauna, have been designated as protected areas to conserve and maintain their ecological, cultural, and recreational values. However, NNPs are also an important source of timber and other forest products that support local economies.

To ensure the long-term sustainability of forest resources in NNPs, it is essential to adopt sustainable forestry practices that integrate environmental, social, and economic considerations. These will maintain forest ecosystem functions, such as carbon storage, water regulation, and biodiversity conservation, while also ensuring the responsible use of forest resources for human needs [2].

In summary, the implementation of sustainable forestry practices is crucial for the preservation of natural ecosystems in NNPs. It is therefore essential to prioritize sustainable forest management as a key strategy for maintaining the ecological, economic, and social values of these protected areas.

References:

1. Debryniuk Y.M. Distribution and form diversity of Piceaabies [L.] Karst // Scientific Bulletin / Collection of scientific and technical works – Lviv: NLTU of Ukraine, 2008 – Issue 18.2. P. 7 – 17

2. Golubets M.A. Conceptual foundations of sustainable development of the mountainous region. Lviv: Polly, 2007. 286 p.

3. Project for the organization of the territory, protection, reproduction and recreational use of its natural complexes and objects of the National Nature Park «Skole Beskydy», Irpin, 2016, 736 p.

WOODEN ARCHITECTURE FOR A CARBON-NEUTRAL FUTURE

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The European Union is interested in becoming climate neutral by 2050. This requires the process of decarbonization in all sectors of the economy, and in particular construction sector plays a special role in it. Due to the fact that the