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On the issue of the "ecological corridor" concept

The following scientific paper explores the issue of defining the concept of ecological corridor as a means of protecting Special Protected Natural Areas (SPNA) and objects of the State Nature Reserve Fund (SNRF). The statutory definition given in Paragraph 22 of Article 1 of the Law of the Republic of Kazakhstan "On Special Protected Natural Areas" (hereinafter referred to as the SPNA Law) does not accurately reflect the essence and features of ecological corridors, or their main purpose. A number of legislative rules on environmental corridors contained in Article 81 of the SPNA Law and relevant resolutions of the Government of the Republic of Kazakhstan require adjustments as well. The paper gives a brief historical overview of the development of rules on ecological corridors within the environmental legislation of the Republic of Kazakhstan, as well as the process of establishing ecological corridors. The study has revealed very little attention paid both in Kazakhstan's legislation and legal science to the definition of the concept of ecological corridor. Meanwhile internationally, based on the spatial culture model Patch-Corridor-Matrix by scientists R. Forman and M. Gaudron, they are explored in a whole multitude of scientific papers and separate regulatory legal acts (e.g., in the Kyrgyz Republic). The issues of establishing ecological corridors have been elaborated only in a few studies by landscape ecology and geoecology reps. Based on the analysis of the provisions of the EC RK, the SPNA Law, and other sources of Kazakhstan and foreign law, as well as scientific approaches to the issues of defining and establishing ecological corridors, terminology of landscape ecology and recommendations have been developed to improve Paragraph 22 of Article 1, Paragraphs 1 and 2 of Article 81 of the SPNA Law, as well as to develop new regulatory legal acts.

Keywords: reserve core, landscape ecology, matrix, objects of the State Nature Reserve Fund, special protected natural areas, natural complexes, patch, Ecological Code of the Republic of Kazakhstan, ecological network, ecological corridor.

Introduction

Both the state and society have been ordered legislative and regulatory protection of national parks and other natural resources of Kazakhstan in the Message of the Head of State K. Tokayev to the people of Kazakhstan "Kazakhstan in a New Reality: Time for Action" (September 1st, 2020) [1].

However, long before that, an appropriate regulatory framework has been formed in Kazakhstan and certain experience in protection of SPNAs and SNRF was accumulated, starting with the development of the first acts on nature reserves and ending with a more extensive list of SPNAs of various types and categories and highlighting the concepts of State Nature Reserve Fund and objects of State Nature Reserve Fund.

Concurrently, the conceptual apparatus of the SPNA and SNRF Institute requires amendments in connection with the transformation of relations for the protection of natural objects and complexes as in transitioning from conservative nature protection with the establishment of a special protection regime for individual natural complexes to multidimensional, spatial, and network type of protection.

The emergence of the concepts of ecological network and ecological corridor in the environmental legislation of the Republic of Kazakhstan requires their careful study, since the specialized literature shows an ambiguous approach to their interpretation.

This issue has practically not been addressed in domestic legal literature unless within the framework of landscape ecology and geoecology, while there are few comprehensive monographic studies [2; 112]. Dissertation studies on jurisprudence only mention the concept of ecological corridor [3; 71] and do not describe its legal essence, features, and legal regime. Incidentally, we see a gap in Kazakhstan's legal research [4; 112–113].

The post-Soviet countries pay more attention to this issue, although again within the framework of natural sciences. [5; 18].

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Consequently, the selected issue appears relevant and is caused by insufficiency of elaboration in research or schools of lawyer theory, or in the legislative provisions.

The purpose of this study is to analyze legislation regulating the concept of ecological corridor, to identify problematic issues of its legal regulation, to develop corresponding recommendations and proposals.

The following tasks serve to achieve the goal:

- Analyze national legislation on legal regulation of ecological corridors,
- Define the concept of ecological corridor, and
- Develop recommendations and proposals for improving the legislation of the Republic of Kazakhstan in this part.

The object of the study is the concept of ecological corridor.

The subject of the study is the legislation regulating the relations arising in the process of a network approach to the protection of SPNA and SNRF, as well as scientific research in the studied area.

Methods and Materials

The following general scientific methods were used for the study: analysis, synthesis, comparative legal, logical, systemic, historical, and legal methods.

Most notably, the method of legal analysis has been applied to the normative legal acts of the Republic of Kazakhstan and the norms of law; comparative legal analysis has been used to compare the concept of ecological corridor under the legislation of the post-Soviet countries (Russia, Belarus, Kyrgyzstan and Tajikistan); analysis and synthesis have been used to determine the relationship between the concepts of ecological network and ecological corridor; and historical and legal method proved successful in highlighting the process of legislative consolidation and establishing of ecological corridors in the Republic of Kazakhstan.

The research used the following materials:

- Scientific literature: dissertations and abstracts (D.T. Niyazgulov, Zh.K. Rysbekova, A.S. Tabelinova), articles (O.V. Ruleva, A.S. Rulev, E.M. Panchenko, A.G. Dyukarev, etc.), both in jurisprudence and in geographical, environmental sciences,
- Landscape textbooks (G.A. Demidenko, A.I. Safonov),
- Mass media articles and reviews, and
- Laws and subordinate regulatory legal acts.

Results and discussion

The results of the study are as follows:

- The conclusion on insufficient legal support of the institute of ecological network in terms of its element, the ecological corridor,
- Identification of a gap in legal research and theoretical schools of law on the definition of ecological corridor,
- Author's revision of the definition of ecological corridor,
- A proposal to make additions and amendments to Paragraph 22 of Article 1, Paragraphs 1 and 2 of Article 81 of the SPNA Law, and
- Recommendations on expanding the content of resolutions of the Government of the Republic of Kazakhstan and local executive bodies on ecological corridors or adopting independent provisions on them following the examples set by other states.

The definition of ecological corridor has been first enshrined at the legislative level in the Law of the Republic of Kazakhstan "On Special Protected Natural Territories" of July 7th, 2006 (hereinafter referred to as the SPNA Law); however, the Kazakhstan legislation would mention it even earlier.

Indicatively, the Concept of Development and Placement of Special Protected Natural Areas of the Republic of Kazakhstan until 2030 has stated that the development of a network of protected areas is implemented on the basis of one of the theoretical provisions of landscape ecology, namely, the one about nodes (cores) and corridors. However, this regulatory legal act does not list the corridors as green.

More specific on the issue was the Program for the Development of the System of Specially Protected Natural Areas of the Republic of Kazakhstan for 2007—2009. It indicates nature reserves and national parks as "protected cores" "interconnected by areas with less strict protection (nature sanctuaries, conservation areas), as well as with elements of ecological network: ecological corridors, forests, water protection zones and strips, and other protected natural areas".

We commend the state bodies of the Republic of Kazakhstan and the subjects of Kazakhstan's regulation-making for the following: After the adoption of the SPNA Law and the promulgation of provisions on ecological corridors in it, the first ecological corridor, the Yrgyz-Torgai-Zhylanshyk, was created in the Kostanay region to restore and increase the saiga population in the Republic of Kazakhstan [6]. Next off, two more: one to ensure migration of the Karatau argali on the ridges of the Karatau mountains (the Turkestan region) [7] and Kapshagai-Balkhash corridor in the Almaty region [8].

Even though there is a total of four ecological corridors currently operational [9], it is still clearly not enough to ensure biological diversity. Construction of communications (roads and railways, oil and gas pipeline systems) ignored conditions of animal habitats and their migration routes entirely, which ultimately had detrimental impact. Case in point, the Astana-Shchuchinsk highway has blocked migration routes of marals, the Western Europe-Western China highway has blocked migration routes of all large artiodactyls, and the construction of the Shalkar-Beineu railway has likely led to a sharp reduction of the Ustyurtsaiga population. Currently, this population is struggling to reach its previous number (over 500,000 animal units in 1970, currently 28,000), has lost fertility, and seized its winter migration to Uzbekistan and Turkmenistan, since the migration routes are now blocked by an active railway track.

Accordingly, we need new ecological corridors and appropriate regulatory legal acts describing the place, time, and process of their creation in sufficient detail.

Having analyzed the existing resolutions of local executive bodies on ecological corridors, we can acknowledge that, with the exception of the very first one, they are low-informative and are limited to indicating the adoption of such a decision, the purpose of creation, area, and region. The resolution on creation of Kapshagai-Balkhash also contains an appendix indicating space coordinates. Most certainly, legal acts on ecological corridors must go into much greater depth.

We would like to reiterate on a comparative novelty of the ecological network's key concepts. Prior to the inclusion of concepts of ecological network and ecological corridor in Kazakhstan legislation, similar concepts would be developed in landscape ecology based on the concept of spatial structure Patch-Corridor- Matrix by the American ecologist R. Forman and the French forestry scientist M. Gaudron (1986, 1997) [5; 18].

Intriguingly, any significant objects can be matrices, or "common and closely related types of landscape elements that play a dominant role in the landscape's functioning", while the patch is "a nonlinear surface that differs in its appearance from the surrounding one". The corridor is "a narrow strip that separates the matrices from each other".

It is assumed that the SPNA network consists of key SPNA objects or other large natural formations, the so-called nodes (cores) connected by spatial corridors also representing areas of nature. These can be natural ways of animal migration, plant propagation, both land and water (e.g., riverbeds). If necessary, in places of close contact with the artificial environment (railway tracks, highways, bridges, viaducts), nature can be supplemented with structures of non-natural origin disguised as objects of the natural environment).

Ecologists usually refer to the above nodes (or cores) as ecological cores, biocenters, natural core, or regional center of biodiversity. Ecological corridors are designated as transit territories (they provide the required connection between key territories), linear structures (axes or corridors), linearly elongated elements (biocorridors connecting cores) [10].

The above terms have been widely discussed and applied in theory in landscape ecology first and emerged in environmental legislation long after. The beginning of landscape ecology dates back to 1939 when C. Troll introduced the term "landscape ecology" (the ecology of landscapes) while the revival and active development took place in the 70–80s [11; 26–29]. Accordingly, the concepts of matrix, patch, and corridor have been actively discussed in scientific circles since 1986. As indicated above, in the legislation of the Republic of Kazakhstan, the concept of corridor appeared in 2000.

Few points should be stressed here.

Firstly, landscape ecology focuses a lot on the optimal combination of both natural and natural-anthropogenic complexes as indicated by a multitude of textbooks. For instance, V.A. Bakarasov argues that "the object of landscape ecology research is landscapes considered as polystructural and multicomponent natural (and natural-anthropogenic) formations" [12; 5].

Furthermore, we believe that the development of environmental sciences will lead to the active development of the institute of protected areas in settlements, the creation of so-called ecological frameworks that cover both natural and artificial objects. The concept of ecological framework is broader than that of the ecological network precisely due to the inclusion of anthropogenic objects in the first one.

Secondly, the science in question pays particular attention to human and human ways to "fit" into the natural environment. Scientists emphasize that "human economic activity in relation to natural conditions" is one of the "main directions of landscape ecology".

For these reasons, unlike environmental law, this science puts human interests before nature's. Sometimes this disregards the fact that a human health and life expectancy rather depend on natural and climatic conditions than on the level of comfort in immediate environment.

Thirdly, the conceptual construct of natural sciences and jurisprudence may differ significantly and sometimes the same phenomenon could be described and denoted by different terms. To name few, biota and wildlife objects are "plant and animal life", flora is "plant life", and fauna is "animal life". Laws and subordinate acts must use legal terminology.

These points must be taken into account when drafting regulatory legal acts and various concept definitions particularly.

Thus wise, since 2000, Kazakhstan has been implementing a network approach to the development of protected areas, i.e., considered them not as separate, isolated territorial objects but as interconnected ones, as part of a single network. The so-called ecological corridors have been playing the role of connecting links.

The SPNA Law gives the following definition: "Ecological corridor is a part of the ecological network represented by protected areas of land and water bodies connecting special protected natural are as to each other and to other types of protected natural areas to ensure natural migration (distribution) of wildlife and conservation of biological diversity" (Paragraph 22 of Article 1 of the SPNA Law).

The ecological network is understood as "a complex of special protected natural areas of various categories and types connected to each other and to other types of protected natural areas by ecological corridors, organized according to the natural, historical, cultural, and socio-economic features of the region" (Paragraph 23 of Article 1 of the SPNA Law).

Evidently, both definitions fulfill their task through each other: the definition ecological corridor indicates belonging to an ecological network while the latter concept is defined through the mention of ecological corridors' connecting function. This hinders understanding the rule of law and forces the search for other concepts.

The disadvantages of the ecological corridor's definition are as follows.

Firstly, the initial focus on the fact that it is part of the ecological network is not a requirement. Such an indication would be appropriate in the educational literature, but the rule of law must be concise.

Secondly, the definition specifies both main cores of protected areas and other types of protected natural areas. It is unclear what the latter are. Those might just as well be both individual objects of the State Nature Reserve Fund (SNRF) or not areas at all, e.g., a small pond, a relict tree or a natural monument. Or these could be recreational lands; however, they are usually not referred to as protected natural areas. Most likely, these are natural complexes that do not fall under the concept of protected areas. We believe that some SNRF objects (geological, landscape objects and their complexes, wetlands, unique natural water bodies or their sites) and natural complexes that do not fall under the concept of protected areas can act as so-called nodes (cores).

Thirdly, an ecological corridor's task of preserving other parts of the ecological network needs to be written in the law as well. Specifically, by ensuring the transit of wild animals, ecological corridors (migration routes of saigas, marals, fish spawning waterways, etc.) thereby preserve their numbers. Therefore, when including some SNRF objects as cores, ecological corridors should be fixed as also ensuring their safety. There is all the more reason for this as Paragraph 1 of Article 81 Ecological Corridors of the SPNA Law indicates this directly.

Fourthly, in its current definition, the ecological corridor is represented by protected areas of land and water bodies. However, based on the landscape ecology logic, such a corridor is not just linear, but rather a spatially linear object, i.e., it is a three-dimensional space that includes airspace. That is exactly where birds are migrating.

Additionally, the environmental legislation also presents protected areas as a 3D model: Paragraph 3 of Article 1 of the SPNA Law states that they include plots of land, water bodies, and airspace above them with natural complexes and objects of the state nature reserve fund provided with a special protection regime [6]. We believe that 3D holographic environment models are the future. Planning and coordination of environmental protection activities begins and will be built on such a basis, especially in the conditions of intensive digitalization of Kazakhstan.

Fifthly, the definition of ecological corridor uses the non-legal term "wildlife objects" as lawyers use the different term "objects of plant and animal life".

Sixthly, here we are talking only about the conservation of biological diversity while ignoring landscape diversity. Cite one example, the Law of the Republic of Belarus "On Environmental Protection" of November 26th, 1992, No. 1982-XII specifies "preservation of natural ecological systems, biological, and landscape diversity" as the goal in the definition of the national ecological network. We believe that this could be used to form an updated definition of ecological corridor, but not limited to objects of the animal world.

We see the definition of an ecological corridor as follows: "ecological corridor is a plot of land and (or) water bodies, and airspace above them connecting other parts of the ecological network (special protected natural areas, objects of the state nature reserve fund, or other natural complexes) and ensuring their preservation, biological and landscape diversity, protection of natural ways of animal migration and plant propagation".

The analysis of Article 81 Ecological Corridors of the SPNA Law has also shown some drawbacks as we see them.

Case in point, when specifying the goals of creating ecological corridors Paragraph 1 states that protection and arrangement of natural migration routes of animals and distribution of plants applies only to those that live and grow in special protected natural areas. But what about other objects of the plant and animal world? Saigas, to name a few, move and live not only in protected areas, but also outside them.

Even more so, the same paragraph states that "ecological corridors are created on land plots of all categories" even though the current definition of an ecological corridor stipulates that it is also represented by protected areas of water bodies.

Paragraph 2 does not mention water bodies as well.

This issue can be solved by introducing the following amendments and additions:

1. Supplement Paragraph 1 of Article 81 of the SPNA Law with "and landscape" after "biological".

2. Exclude the following text snippet from Paragraph 1 of Article 81 of the SPNA Law: "living and growing in special protected natural areas".

3. In paragraph 2 of Article 81 of the SPNA Law, replace "use of these lands" with "their use".

In general, an analysis of Kazakhstan's legislation on ecological corridors has shown that establishment of uniformity in creation of ecological corridors requires a detailed procedure. For one, the Republic of Kyrgyzstan has adopted the Procedure for Organizing Ecological Corridors that is currently in effect.

The result of the discussion of this is sueis identification of insufficient elaboration in the norms of the Kazakhstan legislation on ecological corridors.

Conclusion

The aforementioned issue can be solved by introducing appropriate amendments and additions to the SPNA Law, accompanying resolutions of the Government of the Republic of Kazakhstan and local executive bodies.

Supposedly, there is a second option: instead of expanding the content of Akimat resolutions on ecological corridors, appropriate is adoption of a separate subordinate normative legal act, a regulation or a procedure for organizing ecological corridors in the Republic of Kazakhstan, at the level of the Government of the Republic of Kazakhstan.

The key here is the definition of an ecological corridor (the author's definition is proposed above), which should reflect the following features:

- It is a spatially linear object,
- It connects not only protected areas, but other types of protected natural objects (SNRF) as well,
- It preserves other parts of the ecological network, and
- It provides both biological and landscape diversity.

Speaking of the definition itself, the text of the norm must be corrected in terms of legal technique and use legal terminology.

We believe that the proposed results will expand the theory of environmental law and have practical value as they contribute to further development of ecological network and creation of new ecological corridors.

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А.Д. Жантасова

«Экологиялық дәліз» ұғымының кейбір мәселелері

Мақала ерекше қорғалатын табиғи аумақтарды (ЕҚТА) және мемлекеттік табиғи-қорық қорының объектілерін (МТҚҚО) қорғау құралы ретінде «экологиялық дәліз» ұғымын анықтау мәселесіне арналған. «Ерекше қорғалатын табиғи аумақтар туралы» Қазақстан Республикасы Заңының (бұдан әрі — ЕҚТА туралы Заң) 1-бабының 22-тармағында бекітілген анықтама экологиялық дәліздердің мәні мен сипаттамалық белгілерін, олардың негізгі мақсатын дәл көрсетпейді. ЕҚТА туралы Заңның 81-бабында қамтылған экологиялық дәліздер туралы бірқатар нормалар мен ҚР Үкіметінің тиісті қаулылары да түзетулер енгізуді талап етеді. Автор мақалада Қазақстан Республикасының экологиялық заңнамасындағы экологиялық дәліздерге қатысты нормалардың қалыптасуына, сондай-ақ іс жүзінде экологиялық дәліздерді құру үдерісіне қысқаша тарихи шолу жасаған. Зерттеу барысында Қазақстанның заңнамасында да, заң ғылымында да «экологиялық дәліз» түсінігінің анықтамасына нақты түсінік берілмегендігін, ал шетелдік ғалымдар Р. Форман мен М. Годронның көптеген ғылыми еңбектері «матрица-дақ-дәліз» құрылымының тұжырымдамасына негізделгені және шетелдік жекелеген нормативтік құқықтық актілерде (мысалы, Қырғыз Республикасында) тұжырымдама берілгені анықталған. Ландшафттық экология және геоэкология ғылымдары өкілдерінің кейбір зерттеулерінде ғана экологиялық дәліздерді құру мәселелері пысықталған. ҚР ЭК нормаларын, ЕҚТА туралы заңды және қазақстандық және шетелдік құқықтың басқа да көздерін, сондай-ақ экологиялық дәліздерді анықтау және құру проблемаларына ғылыми көзқарастарды, ландшафттық экология терминологиясын талдау негізінде ЕҚТА туралы Заңның 81-бабының 1, 1 және 2-тармақтарының 22-тармақтарын жетілдіру, сондай-ақ жаңа нормативтік құқықтық актілерді әзірлеу бойынша ұсынымдар әзірленді.

Кілт сөздер: қорғалатын өзек, ландшафттық экология, матрица, мемлекеттік табиғи-қорық қорының объектілері, ерекше қорғалатын табиғи аумақтар, табиғи кешендер, дақ, Қазақстан Республикасының Экологиялық кодексі, экологиялық желі, экологиялық дәліз.

А.Д. Джантасова

К вопросу о понятии «экологический коридор»

Статья посвящена рассмотрению вопроса определения понятия «экологический коридор» как средства охраны особо охраняемых природных территорий (ООПТ) и объектов государственного природно-заповедного фонда (ОГПЗФ). Определение, закрепленное в п. 22 ст. 1 Закона РК «Об особо охраняемых природных территориях» (далее — Закон об ООПТ), недостаточно точно отражает сущность

и характерные признаки экологических коридоров, основное их предназначение. Ряд норм об экологических коридорах, содержащихся в ст. 81 Закона об ООПТ, и соответствующие постановления Правительства РК также требуют внесения корректив. В статье дан краткий исторический экскурс в формирование норм об экологических коридорах в экологическом законодательстве Республики Казахстан, а также процесс создания на практике экологических коридоров. В ходе исследования выявлено, что как в законодательстве, так и в юридической науке Казахстана вопросам определения понятия «экологический коридор» уделялось крайне мало внимания, тогда как за рубежом, на основе концепции пространственной культуры «матрица–пятно–коридор» ученых Р. Формана и М. Годрона, они представлены во многих научных работах и в отдельных нормативных правовых актах (например, в Кыргызской Республике). Лишь в некоторых исследованиях представителей наук ландшафтной экологии и геоэкологии проработаны проблемы создания экологических коридоров. На основе анализа норм Экологического кодекса РК, Закона об ООПТ и других источников казахстанского и зарубежного права, а также научных подходов к проблемам определения и создания экологических коридоров, терминологии ландшафтной экологии разработаны рекомендации по совершенствованию п. 22 ст. 1, п. 1 и 2 ст. 81 Закона об ООПТ, а также по разработке новых нормативных правовых актов.

Ключевые слова: заповедное ядро, ландшафтная экология, матрица, объекты государственного природно-заповедного фонда, особо охраняемые природные территории, природные комплексы, пятно, Экологический кодекс Республики Казахстан, экологическая сеть, экологический коридор.

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