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Middle Transnistria in structure national ecological network of Ukraine: state and prospects of development

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Abstract

The paper analyzes the structure of the Middle Transnistria national ecological network. The scheme of regional ecological network with the release of its structural elements. Showing prospects of development by 2020.

Key words: biological and landscape diversity, Middle Transnistria, regional ecological network, scheme, structural elements.

Introduction

With the aim of biotic maintenance and landscape variety, discontinuation of natural environment, degradation processes maximal renewal of natural framework and forming the balanced development of the territory of Ukraine, there was worked out the project of forming and realization of ecological network.

Middle Transnistria (20 thousand km², within Ternopil', Khmel'nytskyi and Vinnytsya region), is located within the most cultivated region – Right-Bank Forest-Steppe Ukraine. Problems of improving the structure of modern unique landscapes and their rational use, protection, preservation of landscape and biotic diversity, stabilization of ecological balance are extremely important for Middle Transnistria [Denysyk 2014].

The main methodical principle of practical introduction of local and regional ecological networks as constituents of national ecological network must be the principle of prevention fragmentation landscapes. For this purpose the ecological network of different levels should be concerted among themselves. It is therefore necessary to create the integral and constrained inter se system of different levels

of ecological networks, the structural elements of them which are territories that execute certain functions – key (natural kernels), connecting (ecological corridors), buffer and refurbishable territories [Shelyag-Sosonko 1999].

Main part

Analysing the worked out chart ecological network of Middle Transnistria (picture 1) we researched: 1) the amount of key territories (natural kernels) – 16 (the area is 325 305 hectare), that presents 16,26% of general area of region; 2) connecting territories (ecological corridors) – 25 (the area is 1 230 323 hectare), that presents 59,74% of general area of the region; 3) buffer territories, that are set round key and connecting territories of the region at the distance of 2 kilometres that occupy the area about 120 thousands and; 4) the amounts of refurbishable territories which had been researched on the first stage – 11, however, on results of further researches, their amount and area will constantly change. After our calculations, the area of refurbishable and buffer territories of Middle Transnistria, that in future will be included in the complement of regional ecological network, makes 150 thousand. In the process of the research such natural kernels are distinguished: the international level – Dnister and Tovtru; national – Zalizhchyke; regional – Nova Ushyts'ke, Panivets'ke, Murafske, Lyadivs'ke, Nadtransnistre; local – Rosokhas'ko-Ozeryans'ke, Berem'yno-Shutromyns'ke, Shupars'ke, Savins'ko-Pulikovske, Tsykivs'ke, Vin'kivs'ke, Hrabarkivs'ke, Haryachkivsko-Knyahyns'ke [Denysyk 2014; Mudrak 2012b].

Conducting the generalization of scientifically-methodical researches, normative base [*Laws of Ukraine...* 2000; *Laws of Ukraine...* 2005], out own field researches and taking into account the project “Erected regional scheme of the formation of ecological network of Ukraine” [Research Report... 2008] it was set that in Middle Transnistria one ecological corridor of national level is stretched out: meridional – Dnister. It passes along the valley of the river Dnister and forms a problem, as a river-bed and the valley of Dnister is considerably anthropogenic. Taking in to account the modern ecological state and physical-geographical description of the territory with in the limits of the region 24 ecological corridors are distinguished: 8 are interregional and 16 are of local levels. The local ecocorridors of the region are presented by the river valleys of the branches of the Dnister [Mudrak 2012a].

We are going to describe the distinguished ecological corridor of the investigated region on the example of the Dnister latitudinal-meridional ecological corridor (connecting territory) that is timed to the valley of the river Dnister and its branches leftin. It plays an important to be relating between Podilya, Prykarpattya and Pokut'ya. In several places its width is up to 5 kilometres, at the same time in its larrowest places it is limited to the canyon valley, 500 mat

its width. Dnister ecological corridor executes the functions of migratory ways between the natural kernels of Podolsk-Prykarpattya and Opil'sko-Pokutskoy parts. The function of Dnister ecological corridor is the maintenance of the unique beech-beechen, hornbeam-oak, rocky-oak forests, of real and steppified dry-valley and meadow steppes [Mudrak 2012a, 2012b].

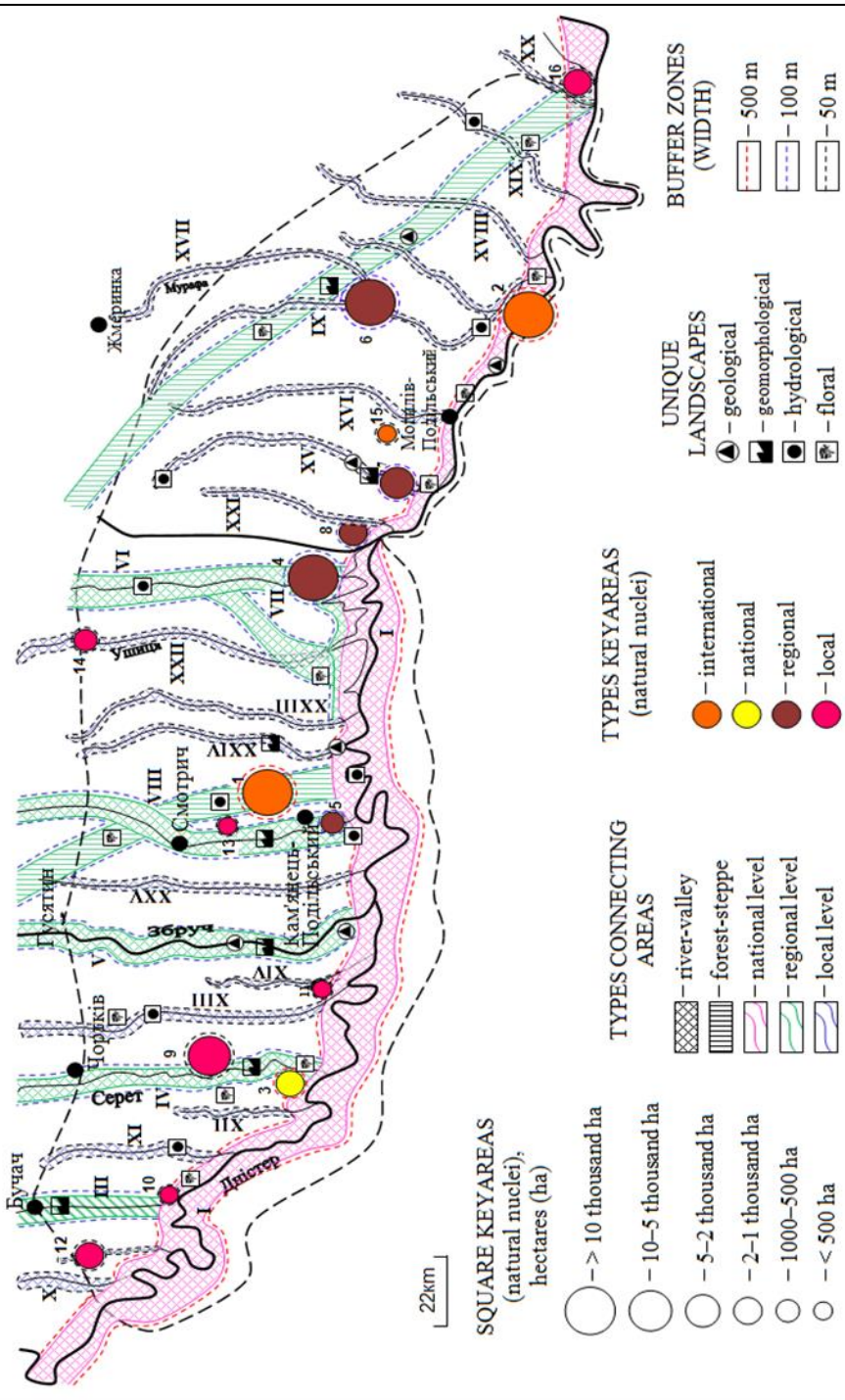
The slopes of Dnister valley are covered by shrub, meadow, steppe and rock-steppe vegetation that have transitional features from boreal to pontych and in combination with river-bed part is the reliable way of migration of biota. Within the growing ecological corridor 1540 types of higher vascular plants grow belonging to 650 genera and 130 families. Most types of centraleuropean type of distribution then boreal holarctic and paleoarctic types, farther mediterranean and steppe pontych. Among them – 30 endemic, 40 to the relict, 26 frontieral, 40 disjunctive-areal kinds. Especially guard kinds, that the conventions brought to Berne convention, are *dracocephalum austriacum*, *fritillaria montana*, *pulsatilla grandis*, *schivereckia podolica*, *cypripedium calceolus*. To Red book of Ukraine are brought 60 types of plants, 149 kinds are regionally rare [Mudrak 2011, 2012a, 2012b, 2013].

Fauna within the limits of Dnister of ecological corridor counts about 310 types of vertebrates: there are 54 types of mammals, 50 – fishes, 11 – amphibians, 11 – reptiles, 174 – birds. Invertebrates are numerous and finally are not studied. To Red book of Ukraine are brought 80 types of fauna, there are 14 mammals, 26 – birds, 40 – insects. Two objects “Bakota bay” (1590 hectare), “Reaches of the river of Smotrych” (1480 ha) are the wetlands of international value and play an important role in maintenance of landscape-biotic variety of Dnister pool as habitats existence of waterfowls birds [Mudrak 2011, 2012a, 2012b, 2013].

In the structure land-tenure of ecological corridor prevails forestry, meadow-steppe, scrubby, wetland vegetation, occupies 58,6% of the territory, 36% agricultural, 5,4% travelling, settler and by recreational landscape complexes [Mudrak 2012a].

Within the limits of Middle Transnistria in the complement of Dnister of ecocorridor enter 114 protected objects, total area 20 236,74 hectare.

PROJECT ECOLOGICAL NETWORK MIDDLE TRANSISTRIA



ECOLOGICAL CORRIDOR

- | | |
|--------------------------------|---------------------|
| I. Dnisters'ky | XXIV. Tsyhankivs'ky |
| II. Medobors'ky (Tovtry) | XV. Lyadovs'ky |
| III. Stryps'ky | XVI. Nemuys'ky |
| IV. Serets'ky | XVII. Murafs'ky |
| V. Zbruchans'ky | XVIII. Rusavs'ky |
| VI. Maliyevets'ko-Hlibovyts'ky | XIX. Markivs'ky |
| VII. Horayivs'ko-Rudkovs'ky | XX. Kamyens'ky |
| VIII. Tovtry | XXI. Karayets'ky |
| IX. Tovtryvo-Murafs'ky | XXII. Ushyts'ky |
| X. Koropets'ky | XXIII. Studenyts'ky |
| XI. Dzhurins'ky | XXIV. Tarnavs'ky |
| XII. Toupsky | |

Structural elements of the ecological network Middle Transnistria (key and connective territories)

Ternopil' region						
Key areas						
№	name	status of the ecological network			square, hectares	
9	Rosohatsko-Ozeryans'ka	local			6040	
10	Berem'yansko-Shutromyns'ka	local			110	
3	Zalishchyns'ka	national			1305	
11	Shupars'ka	local			750	
12	Savynsko-Pulikovs'ka	local			1104	
<i>Total</i>					9309	
Connecting areas (natural ecological corridors)						
№	name	geographical restriction	length, km	width, km	status of the ecological network	square, hectares
IV	Serets'ka	The lower part of the valley river Seret	73	2-4	interregional	43 824
V	Zbruchans'ka	Middle and lower valley river Zbruch	81	2-5	interregional	567 090
I	Dnisters'ka	The valley of the river Dniester	215	2-6	national	49 773
III	Stryps'ka	The lower part of the river valley Strypa	43	1-2	local	12 256
X	Koropets'ka	The lower part of the river valley Koropets	18	2-6	local	14 218
XI	Dzhurins'ka	Valley river Dzhuryn	40	2,5-5	local	15 168
XII	Toups'ka	Valley river Toupa	44	1-3,5	local	9961
XIII	Nichlavs'ka	Valley river Nichlava	83	2-6,5	local	35 275
XIV	Tsyhankivs'ka	Valley river Tsyhanka	40	2-4	local	12 032
<i>Total</i>						759 597
Khmel'nytsky region						
Key areas						
№	name	status of the ecological network			square, hectares	
1	Khmel'nitsky-Tovtry	international			267 705	
4	Novoushitska	interregional			10 122	

5	Panivetska	interregional				2403
13	Tsykivska	local				346
14	Vinkovetska	local				950
<i>Total</i>						281 526
Connecting areas (natural ecological corridors)						
№	name	geographical restriction	length, km	width, km	status of the ecological network	square, hectares
II	Medoborska (Tovtry)	Tovtry logs	20	5–12	interregional 1	15 320
VI	Maliyevetska-Hlibivska	Valley river Callus	61	4–12	interregional 1	48 822
VII	Horayivsky-Rudkivska	The valley of the river Dniester	42	2–4	interregional	12 659
VIII	Tovtry	Tovtry logs	90	5–12	interregional 1	76 586
XXII	Ushyts'ka	Valley river Ushytsya	22	3–7	local	15 239
XXII I	Studenytska	Valley river Studenytsya	17	1–3	local	16 784
XXI V	Tarnavska	Valley river Tarnava	64	1–5	local	14 789
XXV	Zhvanecka	Valley river Zhvanchyk	69	3–9	local	12 678
<i>Total</i>						212 877
Vinnitsia region						
Key areas						
№	name	status of the ecological network			square, hectares	
2	Dnisterska	international			18 230	
6	Murafska	interregional			10 069	
7	Lyadovska	interregional			3503	
8	Naddnistrianska	interregional			1146	
15	Hrabarivska	local			487	
16	Horyachkivsko-Knyahynska	local			1035	
<i>Total</i>					34 470	
Connecting areas (natural ecological corridors)						
№	name	geographical restriction	length, km	width, km	status of the ecological network	square, hectares
I	Dnisterska	The valley of the river Dniester	166	2–6	national	66 421
IX	Tovtry-Murafska	Murafski Tovtry	140	2–6	interregional 1	57 246
XV	Lyadovska	Valley river Lyadova	88	1–3	local	35 213
XVI	Nemuyska	Valley river Nemuya	64	1–2	local	9618
XVII	Murafska	Valley river Murafa	157	1–4	interregional 1	39 253
XVIII	Rusavska	Valley river Rusava	68	1,5–2,5	local	13 612
XIX	Markivska	Valley river Markivka	70	2–3	local	13 989
XX	Kamyanska	Valley river Kamyanka	16	2–5	local	12 150
XXI	Karayetska	Valley river Karayets	55	1–4	local	10 347
<i>Total</i>						257 849
<i>All Middle Transnistria: key areas – 16,26% of the area of the region</i>						325 305
<i>All Middle Transnistria: connecting areas – 61,74% of the area of the region</i>						1 230 323
Structural elements of ecological network Middle Transnistria – 78% of the area of the region						1 555 628

Conclusions

For the effective functioning of Dniester of latitudinal-meridional ecological corridor it is needed to conduct the complex of measures: to create the new unique protected objects and buffer zones round them; to conduct optimization of land-tenure; to distinguish bank-protection zones and off-shore-protective stripes; to carry out renaturalization of the fragmented vegetable cover (especially for refurbishable territories); to decrease therecreational loading; to enter a ecologically safe agrarian production; to stop mining (especially building materials); to enter the prudent mode of sustainable natural resources; to assist to the development of ecological (agrarian) tourism.

Within the limits of region there are all necessary terms for forming the effective regional ecological network, that will have the area on the first stage (in 2020) of 16,26% of the total area of the region, to which the key territories are higher mentioned will enter. In future it will be necessary to conduct optimization of land-tenure within the limits of ecological networks. Though the project of the “Erected chart of forming of regional ecological network of Ukraine” is already, exists, however it is has not been yet completed and needs the perfection and revision. It is necessary to attach quite a lot of efforts for the selection of the earth of buffer and refurbishable territories, increase of areas of testament due to reserved, expansion of operating and creation of the new protected objects, it is necessary to include, the offered unique landscapes of naturally-anthropogenic and anthropogenic origin, to the ecological network of region that would present all levels of the physical-geographical districting of Middle Transnistria.

Literature

- Denysyk G.I. (2014), *Unique Landscapes Middle Transnistria*, Vinnytsia.
- Laws of Ukraine “On Ecological Network of Ukraine” (2004), Supreme Council of Ukraine no. 55.
- Laws of Ukraine “On National program of national ecological network of Ukraine for 2000–2015” (2000), Supreme Council of Ukraine no. 47.
- Mudrak O.V. (2011), *Promising Biosphere Reserve “Dniester Canyon” – An Important Part of the National Ecological Network*, [w:] O.V. Mudrak, G.V. Mudrak, *Environmental Protection and Sustainable Natural Resources*, Kamenets-Podol’sky.
- Mudrak O.V. (2012a), *Dniester Ecological Corridor in the Structure of Ecological Network Podil’ya: Current State and Prospects of Development*, [w:] A.V. Mudrak, G.V. Mudrak, “Green” Economy: Prospects for Implementation in Ukraine, t. II, Kyiv.
- Mudrak O.V. (2012b), *Sustainable Development Ecological Network Podolia: State, Problems, Prospects. Monograph*, Kyiv.
- Mudrak O.V. (2013), *Features Preservation Biodiversity Podil’ya: Theory and Practice. Monograph*.
- Research Report on the Implementation of Research Work “Preparation of Draft Consolidated Scheme Establishing an Ecological Network of Ukraine” (2008), Kyiv.
- Shelyag-Sosonko Y.R. (1999), *Building Econet Ukraine*, Kyiv.