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Ukrainian steppes: current state and perspectives for protection

Stepy ukraińskie: stan aktualny i perspektywy ochrony

SUMMARY

In this paper the current state of Ukrainian steppe ecosystems is analyzed and recommendations for diminishing ongoing destructive processes are given. First necessary step would be to convert the most significant steppe territories to protected areas. Also, in Ukraine it is advisable to discriminate the nature protection into regime of absolute protection (no human impact) and that of managed biodiversity, between nature reserves and other categories protected areas. Also, information and legal vacuum concerning steppe problems is found to exist in Ukraine.

STRESZCZENIE

W pracy przedstawiono aktualny stan ekosystemów stepowych na Ukrainie oraz zalecenia działań mających na celu powstrzymanie ich degradacji. Przede wszystkim stepy powinny zostać objęte ochroną obszarową o najwyższej kategorii ochrony. Na Ukrainie zaleca się również rozróżnienie między ochroną ścisłą (bez ingerencji człowieka) a zachowaniem bioróżnorodności w rezerwatach przyrody i obszarach o różnej kategorii ochrony. Zwrócono także uwagę na brak informacji i uregulowań prawnych dotyczących problemów ochrony stepów na Ukrainie.

K e y w o r d s: Ukrainian steppe, threats, practical measures

S ł o w a k l u c z o w e: stepy ukraińskie, zagrożenia, środki zaradcze

INTRODUCTION

Ukrainian steppe is a part of the large Eurasian steppe zone, which fluctuated due to climatic changes. In early Quaternary, Ukraine was mostly covered by steppe; in Pleistocene, by steppe-tundra, as the climate was dry; during humid periods between glaciations, by forests (9, 20). In post-glacial times the borders of steppe zone almost did not change (9). The last glaciation to shape the Eurasian steppe occurred more than 10,000 yrs. ago. In Holocene, the steppe areas and forest-steppe borders, too, correlated with humidity. So, during the dry part of Boreal period in Holocene, the steppe flora, according to palinological evidence, consisted mainly of Poaceae and Chenopodiaceae. Steppe flora of the less arid Atlantic period consisted of feather grass (*Stipa*)-motley grass type, and later, meadow-steppe, too (29).

Since around 4,000 yrs B.C., the mosaic patterns were also influenced by man-related conditions (6, 21, 24). During the Subboreal period (2,500–500 yrs B.C.), the unceasing press of animal industry induced changes in flora, resulting in the Festuco-Stipa low grasslands variety (29). Considering that human impact (i. e. grazing, burning, haying) tended to be mosaic and sporadic, the biota was not degrading but branching off new ecological niches for some of steppe birds and ungulates that lately became rare (17, 34, 46, 48). The mentality of the Ukrainians, their way of life and culture developed in these steppe-friendly conditions. Wild Steppe and Great Zaporizza floodplain forests in the Dnieper River valley were as precious to them as the arable lands of Hetmanska Ukraine.

Ukrainians' neighbours, Tatars, also depended upon steppe. However, in the 18th century the Crimea khanat fell and Zaporizza Sicz was cancelled, and the Russian Empire began transforming steppe into the Land of Agrarians (46). Forestry, damming, amelioration and intensive grazing destroyed the native biota. The ameliorative systems and artificial bodies of water in forest-growing areas changed the depth of groundwater and deformed climate. Today, only 4% of steppe zone that used to cover 40% of the Ukrainian territory remain unploughed. Even so, of virgin steppe we now have about 1%, mostly on steep slopes, along valleys, etc., where it cannot be 'humanized' (1, 19).

These estimates ought to be verified by complete inventory of steppe areas, which has so far never been done.

However, it is obvious that steppe has already passed the waterfall on the Regeneration River, along with all indigenous biodiversity that lives in it. The habitat is severely fragmented. For example, in Luhansk oblast it is divided in 2,000 pieces. Its ecological structure is destroyed and unable to expand on abandoned fields; adventive flora and fauna instead invade it. Many animal and plant species, native to steppe, are now on the brink of extinction and listed in the Red Book of Ukraine (7, 8, 18).

So, Pontic-Caspian steppe has mutated under the local climatic and anthropogenic influence and invasions of non-characteristic species – but it has not expired yet, and its state can be improved by taking real actions, not by endless discussions.

Here, we describe some steppe fragments, their current state of conservation, the worst dangers for their existence, and measures needed for their immediate protection.

Steppe resources of Ukraine

A few of steppe areas in Ukraine are rather large. Some of them are included in nature reserves of different kinds, though insufficiently, and compared to other landscapes, rather poorly. It should be noted here that among the nature reserves that are completely steppe-covered, there are four zapovidniks ("Ukrainsky stepovy", "Lugansky", "Mykhajlivska celina" and "Jelanetsky step") and two National nature parks – NNP ("Oleshkivsky pisky" and "Djarylgatsky"). In most of other nature reserves that include portions of steppe, such portions are insignificant, both compared to other

landscapes and as steppe preservation reserves. Thus, NNPs “Podil’sky Tovtry” and “Gomil’shansky lisy” do include steppe patches, but they account for no more than 1/30 of the parks’ territories.

Regional landscape parks (RLP) include a lot more of steppe fragments. Yet for now, RLPs are an inefficient mechanism of nature protection due to their unclear legal status (26).

It is necessary to add that most of NNPs with steppe areas in them were created in 2009–2010.

Ongoing fragmentation of steppe ecosystems is not slowed down by nature conservation. Most of the protected areas are dispersed between local, small nature reserves (zakazniks), that do not have staff and are not sufficient in supporting the necessary regime (26).

The information that we were able to obtain on the current state of protection of Ukrainian steppe is given in Table 1. Analysis was conducted for nature reserves, biosphere reserves, NNPs and RLPs.

Unless these large territories are protected by a conservation status, conserving the steppe zone is a lost cause. Some of them are, or were used as military grounds, which was practically ideal for nature protection. Regardless of whether they were in use, they are now getting ploughed. To prevent this, immediate measures must be taken.

The Hurzuf Forum identified conservational priorities of the Crimea, among them large steppe areas, but they have not been granted the status of the Nature Reserve Fund yet (45).

As for other unprotected steppe areas, they are few and far between fields and artificial forests.

Preserving steppe, preserving biodiversity

Already the percentage of steppe ecosystems is significantly less than is necessary for their stable functioning as reserves of biodiversity. Such deficiency inevitably entails degradation and consequent disappearance, and the disappearance of steppe biota, too. Steppe-specific and endemic species cannot exist in any other habitat and thus are threatened by extinction. Among 553 animal species listed in the Red Book of Ukraine, 159 depend upon steppe (29%); of them 54 were included in the Red Book in 2009 (7). According to current protection categories, steppe animals can be classified as: disappearing – 33; vulnerable – 46; rare – 67; not estimated – 7; insufficiently known – 5; extinct – 1. Some of them are narrowly distributed endemics: in AP Crimea there are 25 such species, in the Donetsk oblast – 1, Luhansk – 2, Kharkiv – 1, and in Kherson – 4 (8).

The correlation between the reductions of an area with the disappearance of unploughed steppe is supported by studies on local mammals (18, 47). Among 826 species of plants listed in the Red Book of Ukraine, 276 (33.4 %) are found only in steppe, 87 of them are included in the Red Book in 2009 (8). Among them: disappearing species – 53; vulnerable – 99; rare – 55; not estimated – 42; insufficiently known – 22; extinct in the wild – 4. The portion of steppe species is narrowly spread and endemic. In Donetsk oblast there are such 9 species, in Zaporizha – 1, Ivano-Frankivsk oblast – 1, Crimea – 59, Luhansk – 8, Mykolaiv – 4, Odessa – 8, Kharkiv – 1, Kherson – 3, Khmelnytskyi – 1 (8).

The Decree of the Ministry for environmental protection of Ukraine of 16th Oct. 2009 N 545 adopted the List of rare and threatened and typical plant communities that are protected and listed in the Green Book of Ukraine, as an official state document. Thirty-one of these communities are completely steppe-specific (49).

Table 1. The Biosphere reserves, zapovidniks, National nature parks and Regional landscape parks, the area including steppe fragments (22)

Name of object	Oblast	Total area, ha	Year of creation
Biosphere reserves			
BR "Askania-Nova"	Kherson	33,307.60	1985
BR Czornomorski	Kherson, Mykolaiv	89,129.00	1985
Zapovedniks			
Opukski	Crimea	1,592.30	1998
Kazantipsky	Crimea	450.10	1998
Dniprovsko-Orylsky	Dnypropetrovsk	3,766.20	1990
Ukrainsky Stepovy	Doneck, Zaporizza	2,405	1925
Lugansky	Luhansk	2,122.0	1936
Jelanetsky step	Mykolaiv	1,675.70	1996
Mykhajlivska celina*	Sumy	882.9	2009
National nature parks			
Azovo-Syvaszsky	Kherson	52,154.00	1993
Velki Lug	Zaporizza	9,324, including 3,108 steppe ones	2006
Czarivna Gavan	Crimea	10,900	2009
Dvoriczansky	Kharkiv	3,131.2	2009
Djarylgatsky	Kherson	10,000	2009
Karmelukove Podylla*	Vynnica	20,203.4	2009
Tuzlivsky lymany	Odessa	27,865	2010
Dnistrovski canyon*	Ternopyl	10,829.18	2009
Pryazovski	Zaporizza	78,126.92	2009
Pyrjatski*	Poltava	12,028.42	2009
Oleshkivsky pisky	Kherson	8,020.36	2009
Buzki Gard	Mykolaiv	6,138.13	2009
Meotida	Doneck`	20,720.953	2009
Biloberezza Svjatoslava	Mykolaiv	35,223.15, including 6,000 sandy steppe ones	2009
Regional landscape parks			
Bilovodski	Luhansk	14,011.00	2001
Bokalska kosa	Crimea	1,520.00	2000
Velykoburlacky step	Kharkiv	2,042.60	2000
Donetsky Krjaz	Doneck`	7,463a	2000
Zujevsky	Doneck`	1,214.30	2002
Kalynivsky	Crimea	120.00	2000
Karalarsky	Crimea	6,806 including 6,446.00 steppe ones	2007
Kleban-Byk	Doneck`	1,874.00	2000
Peczenizke Pole	Kharkiv	4,997.60	1999
Polovecky step	Doneck`	1,335.00	2000
Tylygulski	Odessa + Mykolaiv	8,195.4+13,954.00	1995
Kramatorski*	Doneck`	1,700	2004
Priingulski	Mykolaiv	3,152.7	2002

*Significant steppe areas in forest-steppe zone.

Also, Ukraine possesses large unprotected steppe areas at plains and quarries.

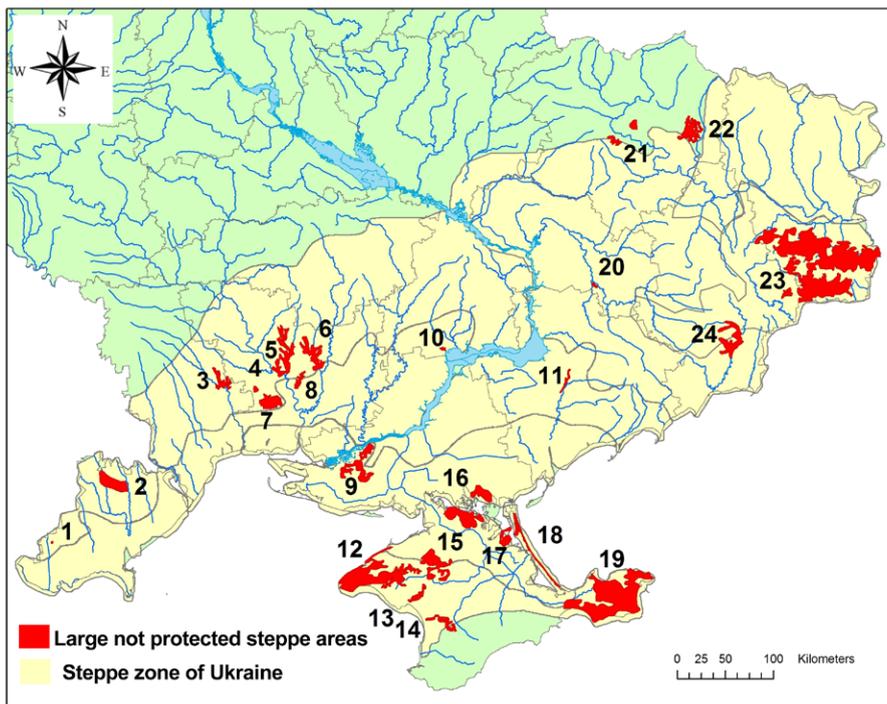


Fig. 1. Some steppe areas that are large and relatively unaltered yet not included in the network of Ukrainian nature reserves: 1. Bolgrad military ground (15 sq. km), 2. Tarutino military ground (130 sq. km), 3. Steppes near Berezivka (115 sq. km), 4. Kyevo-Oleksandrivsky military ground (18 sq. km), 5. Mychajlyvski step (360 sq. km), 6. Steppes on the north of Bashtanski district (270 sq. km), 7. Shyrokolanivsky military ground 225 sq. km), 8. Sebinska gully (55 sq. km), 9. Sand dunes of Curupinsk forestry (340 sq. km), 10. Kam`jansky coastal complex (10 sq. km), 11. Moloczansky ravines (35 sq. km), 12. Steppes of Tarchankut Peninsula (1,172 sq. km), 13. Sasyk-Kyzil-Jar Steppes (75 sq. km), 14. Skvorcovsky step (110 sq. km), 15. Steppes in Czervonogvardijske district (395 sq. km), 16. Coastal and island steppe areas on Syvash banks (excepting NP “Azovo-Syvaszsky”) (565 sq. km), 17. Mouth of Salgyr river (110 sq. km), 18. Arabat Spit (150 sq. km), 19. Steppes on Kerch Peninsula (1,940 sq. km), 20. Vasylykivski military ground (12 sq. km), 21. Fragments, proposed for NNP “Gomil’shansky lisy” widening: a) military ground near v. Blagodatne (21 sq. km) b) fragments on the south from NNP “Gomil’shansky lisy” (49 sq. km), 22. Steppe areas near Kupjansk city (260 sq. km), 23. Donetsk Ridge (excepting areas of current RLP “Donetsky Krjaz”) (3,900 sq. km), 24. Steppes of Starobeszyv and Telmanovo districts (340 sq. km)

Threats to steppe ecosystems and biodiversity

The development of Ukrainian society puts steppe under a number of threats.

Threat one: no recognized legal status. In Ukraine there is no clear understanding at the governmental level, of the notion of “steppe” as such. Legal steppes of Ukraine in most cases still are considered agricultural land, as now preserved dry grassland land, all without exception were

functionally classified as pasture and hay land, regardless of whether they were used as such. But thanks to the wilderness status these areas were not converted to fields or forests. On the other hand, the extensive usage of grasslands significantly reduced their biodiversity. Those plains are not listed as agricultural land, but as ‘unfit for agriculture’, land management and land reserve. All slopes steeper than 3°, according to the Land Code of Ukraine and the Law of Ukraine “On Protection of Land”, are degraded lands. Thus, steppe area is not actually what is protected and used in the discretion of local stakeholders. In such cases, land conservation measures can be wrongly implemented, including afforestation, resulting in loss of steppe habitats.

Problems of creating and management of steppe protected areas. Currently steppe ecosystems are poorly represented among Ukrainian protected areas. First of all, it is a lot easier to obtain a landowner’s agreement on the creation of a protected area of forest, than on a relatively small area of steppe number of users. Large protected areas, such as nature reserves or NNPs, require significant investments, which authorities are often reluctant to approve.

While creating a new reserve is a tricky and tortuous process, same can be said about maintaining the already existing ones. Indeed, the recent trend is to transform them into recreational and commercial institutions. Striking is in violation of the Ukrainian branch of the steppe “Homutovskyy step” and “Kamyani mohyly”, as well as the “Opukski zapovidnik”. The directors of the reserves decided to earn money by encouraging tourism. Another urgent problem is marking the boundaries of a reserve in nature. Contrary to the Decree of the President of Ukraine of May 23, 2005, № 838/2005, most reserves in Ukraine as of January 1, 2010 either exist solely on paper, or are being marked in nature painfully slowly although bearing in nature as to protect the area from land encroachment. Ninety percent of illegal land usage in protected areas stem from the lack of ‘fences’ around them.

Another disaster lying in wait for every zapovidnik, with its stated regime of absolute protection, is to be converted into a biosphere reserve or a NNP. Note that the transformation allows to legally shirk the duty of protecting nature, and to move on to earning money using its resource and recreational capacity, which is incompatible with environment conservation (3). A biosphere reserve can be rezoned at any time, as was done to the Danube Biosphere Reserve when a canal was to be dredged through its core; the latter was simply renamed as a transition area.

The privatization of land. When most of agricultural lands, including steppes, are cut into separate pieces, conserving them or altogether applying scientific rationale to their usage is impossible, since:

- a) the land usage is already determined;
- b) the land may always be converted into a private farm, and then the owner will be permitted to develop the land in any way, even building it over;
- c) it is almost impossible to obtain the landowner’s agreement to create a protected area, since the people are seldom aware of the environmental value of steppe and usually oppose including their plots into the Nature Reserve Fund (NRF).

Neither steppes nor steppe biota have been inventoried. Until now, no complete inventory of steppe habitats or individual species of flora and fauna of Red Data Book or the communities of Green Data Book of Ukraine. The lack of information also makes it impossible making the right management decision about the way to preserve a certain plot, or how to choose the most important steppe fragments for the NRF.

Afforestation. According to the Decree of President of Ukraine №. 995/2008 “On some measures for conservation and restoration of forests and plantations” of November 4, 2008, the Cabinet of Ministers of Ukraine was delegated the task of developing new indices of wooded areas in Ukraine, so that they would reach 20%, and a program of creating new forests on specially selected lands. The regional administrations and the Cabinet of Ministers of the Autonomous Republic of Crimea were ordered to identify these “eroded, degraded, unfit for agriculture, contaminated, and

other lands” for future afforestation. A great deal of valuable steppe patches is considered unfit for agriculture. The Decree of the State Committee of Forestry of Ukraine №371 of December 12, 2008, adopted the optimal indices of wooded areas, and for the South of Ukraine, it means the amount of forests will be doubled.

Afforestation of steppes where rare species dwell is against the Law of Ukraine “On the Red Data Book of Ukraine” and several international conventions, such as the Bern Convention, which prohibits the destruction of habitats of species, listed in the Appendices. Also, since the borders of NRF territories are rarely set out in nature, they are often afforested, which is a violation of the Law of Ukraine “On the Nature Reserve Fund of Ukraine”. And while the violations are numerous, they are seldom prosecuted.

Chaotic ploughing of former steppe military grounds, grazing grounds, and sometimes even slopes is another grave danger. Ploughing of slopes steeper than 7° is prohibited by the Law of Ukraine “On the Protection of Lands”. However, now that a sizable portion of fields is depleted, farmers began intensively ploughing up valleys and slopes instead.

Recreation mostly threatens steppe on the shores of seas and water reservoir. If a resort or another object of stationary recreation is installed, the ecosystem degrades completely. This is an urgent problem for a number of steppe NRF territories of the Black and Azov Seas region, such as NNP Kinburnska Kosa, RLP Karalarsky, etc.

Artificial bodies of water and amelioration. When a pond is created, the slopes of a valley become separated, the hydrological regime is changed, the ecotope of a gully bottom, including, for instance, habitats of some orchids, is destroyed, and recreation of all forms begins, summing up in unrestricted press on the ecosystem: litter, sound and other forms of pollution, etc. Today, we should plan how to overcome the consequences of the grand amelioration efforts of old times.

Mining. Presently, sand, clay and other minerals are mined in increasing quantities, both officially and not. Unfortunately, the landscape allows to dig quarries with little effort, which results in loss of soil and erosion.

Overgrazing. Animal farms in Ukraine are in decline, and there are no big ones left. In spite of that, many steppes are still degraded by cattle. It would seem that they had not been afforested earlier so that there would be grazing grounds; overgrazing leads to great losses in flora.

According to our survey of some specialized farms, sheep are the most dangerous animals threatening the steppe biota, since they do not leave anything above ground. Also, goats and cows perked up somewhat in the steppe region, due to private farmers’ efforts, and steppes near human settlements are degraded all the faster for that.

Pollution. Waste disposal, landfillings, both official and unofficial, are created on the least important, according to the common mentality, plots, namely steppe fragments. Also, the litter tends to be non-rotting. Even worse, there is no waste disposal in some villages.

Burning. Every spring, and sometimes also in summer or in autumn, the steppes are burned by local people. Nobody controls either the place or the time of a burn. When the steppe stretched from one skyline to another, burning was not so detrimental because it was mosaic, and what biodiversity was lost was quickly restored. Now that the habitat is severely fragmented, burning leads to degradation and extinction of steppe biota.

Shore abrasion. Currently an extremely grave threat, since the steppe fragments in the south are often trapped between fields, seas, reservoirs, and quarries. As the shores are intensively abraded, the fragments grow smaller and smaller, all the way to extinction.

Instability in succession. The man-induced landscape and climate transformation of steppe Ukraine spawned so-called reserve successions (1, 38) in all protected steppe areas. The patches, not stabilized by man anymore, quickly mutate into wooded vegetation. Some authors blame the absence of natural steppe fauna, like insects, ungulates, etc., that used to stabilize the communities, (1, 5, 36, 38).

The tendency is clearer at the periphery of the Steppe Zone and on steppe patches outside of its general area; the processes accelerate along with the anthropogenic press. The Forest has several times invaded Steppe during Holocene, but the succession did not threaten the very existence of the Zone due to its sheer size. As Tkachenko notes, the succession can still lead to steppe complexes, albeit with different biota (38, 39). In the meanwhile, nowadays the steppe is so fragmented, the transformations can be catastrophic, since some extremely rare species will be wiped out.

Invasions are currently a worldwide problem, endangering all types of native habitats. In the Steppe Zone, alien species have an easier access, since the fragmented and sickened habitat is not as immune as it had once been. Some aliens have already proved successful, for example *Ambrosia artemisiifolia* L. and *Ailanthus altissima* (Mill.) Swingle.

Public opinion does not favour steppe; there are no governmental or non-governmental organizations to protect it

Levykin (23) underscored an important point of general public opinion, not relating to the problem of conserving steppe, unlike, for example, forest. In the latter case, people root for the conservationists, funds are easily obtained, while in the first, the problem is seldom recognized. Another question is the perception of steppe as fields upon fields of grain, instead of *Stipa* and *Salvia*. Also, grain production is traditionally prioritized over animal industry, despite the fact that in some regions of Ukrainian steppe the latter showed more promise.

How to improve the state of Ukrainian steppes

A complex of measures should be immediately implemented. First of all, the President should adopt a Decree on protection and complex usage of steppes in Ukraine, where the very notion of steppe will be legally defined as a portion of dry land covered with specific vegetation and a habitat of specific fauna. Also, there should be stated that steppe is part of national legacy of Ukraine, a sizable portion of the state's biota, including the rare and the threatened. The cradle of the Ukrainian nation and folklore is necessary for animal industry and tourism.

The definition and the plan should be used as a base for specialized legislation for steppe protection in Ukraine.

Secondly, all steppe fragments in Ukraine should be immediately inventoried, with a universal GIS-layer created, completed by a register of every single patch's environmental value. The State Cadastre of Land should be modified with regard to the steppe's legal status and the GIS-database.

Another step to save large steppe areas seems to be adding them to the existing, or creating new, territories of the NRF, such as zapovidniks, biosphere reserves, or NNPs. By enlarging the already established territories, the costly problem of creating a staff anew is avoided. Zapovidniks seem to be the most promising; military grounds should be paid special attention. Since the military must re-cultivate the territory before relinquishing it to another land user, an expensive enterprise, assigning the land as a part of a zapovidnik allows to save a non-inconsiderable sum of money. In this way, "Tryohizbensky Step", a filial of the Luhansky zapovidnyk, was created.

There also should be a controlling body to monitor the activities in zapovidniks and NNPs, which oftentimes fluctuates from environmental conservation. The control should be accessible to scientists and NGOs. As to the multitude of small steppe fragments, they should be preserved at any cost, by establishing minor objects and territories of the NRF on them. These actions should be aimed to prevent two major threats to the habitat: stationary recreation and afforestation. Everyone not blind to the fate of the steppe remnants should contribute to the campaign for the Cabinet to assign money for the abovementioned measures and for the control of their implementation by authorities local and central, support the initiatives of setting the borders of a NRF territory in nature.

Steppe can be preserved outside of the NRF, too, by using the Law of Ukraine “On the Red Data Book of Ukraine”, which makes preservation of the sites where the rare species are found a mandatory task (27). Similarly, Articles 4–6 of the Bern Convention demand that the habitats of rare species require preservation, and the species themselves are subject to protection and rest during breeding periods (16).

All the aforementioned steps, as well as creating new steppe territories of the NRF, are known to require considerable investments. To provide the funds, a long-term governmental program should be adopted, where all finances will be accounted for and spent on the protection and restoration of steppe. Local funds of environmental protection should also be involved in the effort. Special attention should be paid to developing steppe-friendly animal industry, as well as tourism on the areas not reserved for strict protection.

Steppe is being rapidly lost to a host of reasons, and the loss should be compensated by artificial restoration.

The first priority is to conserve the gene pool of steppe plants and animals. Here, it is possible to rationally utilize the material from plots that would soon be lost to reasons like shore abrasion. Also, connecting steppe and semi-steppe habitats can support their viability, but only if the climate-changing factors, e.g. the ponds and the windbreaks are eliminated, and steppe dominants are massively introduced. One can use the method of agrostepes and some other (13, 15, 31, 37), already approved of in Russia (11). In Ukraine, such works have already begun (35; Ochrymenko, 2007, pers. comm.); there are still enough large not-reserved patches to develop simple cheap techniques.

Experiments on breeding and distributing steppe-forming animals should be started immediately, and the staff of the NRF, especially zoo workers, should take part in the work. Similar studies have already begun on the post-Soviet area, for example, for *Marmota bobac* and bustards (Tokarsky, 2008, pers. comm., 12). Also, research should be conducted on how steppe species adapt to their environment. Population dynamics should permit to select the necessary conservational measures.

Substantial efforts should be directed at once against one of the most threatening factor steppe ecosystem now-afforestation. We need immediate changes to the Decree of President of Ukraine dated November 4, 2009, № 995/2008 “On some measures for the conservation and restoration of forests and green spaces in the Prevention of steppe afforestation areas that are in natural state. You must stop the approval of allotment plots in the steppe zone during the establishment of forest plantations to complete the inventory distribution of rare and endangered animals and plants at each of the steppe areas of Ukraine. You must undo the State Forestry Committee of Ukraine Order № 371 of December 29, 2008 and convert forest cover increased towards afforestation in Ukraine within the northern and western regions and a wind-shelter belts in the south and east (instead of plain afforestation). Also, authorization to initiate the Council of Ministers of Crimea, local administrations to prevent the supply of land under afforestation, occupied steppe vegetation, while to consider such areas as promising Web sites of natural reserve fund local and national significance. As in the case of afforestation and other forms of illegal expansion of steppe area, there is a need to strengthen criminal sanctions. It is necessary to amend the Code of Ukraine “On Administrative Offences” that punishes for all forms of harmful anthropogenic impact on the prairie ecosystem and increases penalties for specified offences. Right up protocols for these offences must be provided by both public and public environmental inspectors.

One of the most difficult issues in preservation of grasslands are questions of succession instability of modern steppe communities. Especially significant is rising these questions in the case of the most highly protected areas in Ukraine – nature reserves. Here the nature should be left to itself under the absolute regime of protection. But throughout history there is an ongoing debate between advocates of absolute measures of protection and regulatory reserves in the steppe (2, 3,

5, 14). It was previously stated that modern steppe fragments are left adrift showing a tendency to transformation, often accompanied by loss of rare fauna and flora. The output of this situation control the so-called regulatory measures that deter the development of artificial shrub-woody vegetation by pasture or hayfields burning (14, 25). However, these measures are usually ineffective, and require daily implementation, yet they contradict the very idea of absolute protection.

Note that the idea of absolute protection formed by a Russian ecologist G. Kozhevnikov and developed in the works of a true fighter for wildlife R. F. Shtilmark (32), can be almost certainly realized only under certain conditions, critical enough for self-maintenance of ecosystem protected area. But not as any non-grounded estimates of what this territory should be (3). Note that the natural course of biological processes is very difficult to recover in small areas, experiencing anthropogenic press on adjacent territories. However, this is inevitable and could be accompanied by a loss of some rare species of plants and animals.

The same are negative consequences for a number of groups of animals and regulatory measures should be taken (2, 14). Universal and the same for all components of biodiversity measures do not exist.

The problem increases even more, since there is a need to distinguish two kinds of areas: the area which functions as a natural reserve determined for preservation of natural processes, and the area of protected biodiversity. However, to ensure non-interference while maintaining all the complex species in one area is almost impossible. Some scientists proposed a comprehensive approach when stock are allocated the reserve area of completely protected steppe (39), but in our opinion, in extremely small areas of steppe reserves of Ukraine, this approach does not justify itself, very much so that for years the Ukrainian steppe reserves discovered that all major types of rare species (at least animals) occur primarily outside the reserves, on semi-transformed areas experiencing some economic impact (1, 3, 40, 41).

The solution to this conflict we see in delimiting natural features preservation of biological processes and progress of biodiversity in natural reserves and all other categories of protected areas, respectively. Similar ideas were found in literature (10) – the protection of individual species (in buffer zones and surrounding objects of natural reserve fund of local importance). It would be ideal to convert the existing reserves of weak organizations into strong regional research centers that would take care of keeping all the nearby remnants of natural ecosystems: reserves, fallow areas. They should advise local farmers on sustainable forms and more efficient steppe lands use.

In the case of protected areas of local importance, they should be legally recognized as the areas that may have state protection. This approach gives good results in Belarus (Abramchuk, 2009, pers. comm.).

There should be some balance between the creation of nature reserves and other categories of natural reserve fund that enable agricultural activities and at the same time develop a specific territory tourism industry. Only in a thoughtful development of a network of various objects of natural reserve fund different categories face a real opportunity to save the currently available varieties of plains with their inherent biotic and abiotic components. However recently the objects of national significance in Ukraine created mainly national parks, and in the neighbouring countries (Russia, Belarus, Moldova) even reorganized natural reserves in national parks (3, 10).

The stability of the steppe network objects requires protection against invasions on the peripheries of their territories and protected areas (outside nature reserves and protected areas) to determine the main focus of invasion and struggle to hold them. Destruction of lesions and invasive species is favourable for agriculture.

Facing indifference to the problems of conservation of the steppe zone, it is necessary as a deliberate campaign to popularize the idea of preserving wilderness. That idea existed through the active role of individuals: V. Dokuchajev, J. Paczoski, N. Kotov, V. Taliyev, I. Borodin, V. Alekhin, F. Falc-Fein and many others living in the early 20th c. The aim was to preserve the positive trends

in virgin areas. But in the 40's interest in the steppe problem was reduced to zero. At a time when steppe protected areas encountered strong resistance and lack of understanding, and when every following crisis causes a spontaneous increase in work on changing the public opinion towards preservation of grasslands within the existing system of land tenure, it is simply necessary, as well as appropriate to inform the general public and persons involved in decisions about the value and problems of steppe areas. To enhance public awareness campaign in the press and on television about dry grasslands and enter the question of grasslands in school and high school rates of Ecology and Environment is necessary. All organizations require guides to make tour packages in steppe regions showing the value and necessity of steppes recovery. Note that with minimum cost of regular visits, located deep in nothing remarkable steppe regions of Ukraine, steppe fragments may be the great pride of the local community, the object of tours for visitors to these regions. This is especially significant for such imperceptibly Northern Crimea nothing outside the region. One should recognize the need for rational introduction of courses on animal husbandry departments of specialized agricultural universities of Ukraine.

Unfortunately the state is not practically engaged in any of the above listed steps. However, active support is incompatible with the existence of grasslands ideas based on sometimes subtle but pseudoscientific concepts, such as afforestation grasslands, as a way to reduce greenhouse gas (33). Given this situation, the environmental community was forced to fill the arising vacuum (42, 43). In 2009 the initiative in the National Ecological Centre of Ukraine and the NGO Association of Friends of Nature (Tokmak, Zaporizka oblast) established the public movement "Save Ukrainian steppe!", which today have joined more than 60 scientists, NGOs institutions and regions.

The movement which has started its activities with real steps against afforestation is currently concentrating all attention on solving the complex problems of conservation of steppe habitats of our country. The initiative has received general public support from the Ministry of Nature Protection of Ukraine. The Ministry proclaimed that copies of all produced consents for ground afforestation must be sent to the Ministry for Revision.

Currently one of the basic activities of the company members is to complete inventory of steppe areas of Ukraine, which has been worked out within the frames of different projects such as inventory of meadow-steppe habitat in the Kiev region (28), or without any project (such as in some eastern regions of Ukraine (44).

Besides, the participants of the public movement drafted the Decree of the President of Ukraine "On protection and integrated use of grasslands in Ukraine" (30). In addition to the complaint of unlawful actions concerning the Ukrainian steppe, forest management and biodiversity is considered by the secretariat of an international convention on protection of wild flora, fauna and habitats in Europe.

CONCLUSIONS

Despite big losses and difficult years for the steppe biome, Ukraine still has large areas of steppe, which is the basis for the existence of endemic and extremely sensitive biodiversity. The existence of this world is threatened by a number of negative factors, increased due to the absence of both legal regulations and social understanding of steppes, as well as of any inventory of the remnants. To confront the issues, a public movement "Save Ukrainian steppe!" was founded. But Ukrainian steppes are more than a national problem, more than even a continental one; some communities found here do not occur anywhere else in the world. We

hope that the international community will also pay attention to the question, and will be ready to cooperate with other steppe-saving initiatives.

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